NOTE TO USERS

Working Towards a Greek-English Cross-Language Passage Retrieval System for Question-Answering

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ABSTRACT

Working Towards a Greek-English Cross-Language

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In this thesis, we present a set of experiments towards a cross-language Greek-English Question-Answering (QA) system. After exploring previous work done both in monolingual and cross-lingual QA, we have applied the common "question reformulation" strategy used in monolingual systems along with different translation strategies and evaluated the results with the TREC question set. We have mainly focused on the passage retrieval component. 24,2% of the documents retrieved for all questions contained a correct answer for the cross language component (compared to 38,3% for the monolingual component) and for 61,2% of the questions used we have obtained at least one document that contained the correct answer (compared to 91% for the monolingiual component).

Acknowledgements

It was the first time that I have done research and I have found it both very interesting and exciting. This work has also contributed to me as a person since it made me remember that things we enjoy in our everyday life were not "just there", but are the result of hard work, dedication and faith.

Of course this work wouldn't be possible without the help and guidance of my supervising professor Dr. Kosseim who I want to thank so much for helping me in completing this work.

I would also like to thank Dr. Bergler for her help and interesting lectures as well as all members of clac who were always helpful.

I must not forget to thank Stelios Piperidis and Prokopis Prokopidis from ILSP who were kind enough to host me at their offices and lent us their Greek NLP tools.

In the end I would like to thank my family and friends in Canada for their moral and financial support.

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Table of Acronyms

BoO	Bag of Objects, Representation of the question
CLEF	Cross-Language Evaluation Forum
DOC	Answer found in source document
DOCR	Answer found in source document with respect to the rewrite
EAT	Expected answer type
MRR	Mean Reciprocal Rank
NP	Noun Phrase
SN	Answer found in snippet
SNR	Answer found in snippet with respect to the rewrite
POS	part of speech
NP-chunker	noun phrase chunker

1 Introduction

1.1 Research Motivation

Web-Based Cross-Language question-answering systems are becoming more and more popular. Using such systems can offer several advantages especially to non English-speaking users. The reason is that the English Web is much larger than any other web and has to offer more information. This makes it the best available corpus for QA systems to try to conclude an answer compared to any other.

As Table 1 shows, the benefits for users that use less frequent languages are even greater compared to the rest, since, for example, the Japanese or the German web can be considered as a much larger corpus than the Korean, Bulgarian or the Greek Web.

In addition, there are many cases where English-speaking users can also benefit from Web-Based Cross-Language question-answering systems, since the English Web as large as it might be may not contain some information available in another language. For example for the question "How many people were killed in the 'Tembi'[1] bus accident in June 2003?" the answer has a greater chance to be found in the Greek Web than in the English one, regardless of its small size.

[1] A region in Greece

English	68.4%
Japanese	5.9%
German	5.8%
Chinese	3.9%
French	3.0%
Spanish	2.4%
Russian	1.9%
Italian	1.6%
Portuguese	1.4%
Korean	1.3%
Other	4.6%

Table 1: Percentage of the Web by language [9]

Cross-Language Question Answering systems will start to become more and more popular especially for less popular languages. For such languages there exist no large corpora (closed or open domain) so the information unilingual question answering systems can use is limited. Cross-language systems on the other hand can be used by users not familiar with popular languages but at the same time can benefit from the vast information popular languages have to offer. Cross-language systems for less popular languages such as the Greek language face another challenge: the limited resources NLP tools available. For example finding tokenizers, POS taggers, lexicons, dictionaries and translation mechanisms is very difficult and in many cases impossible to find. Even the tools that are available are limited and therefore very often of low performance.

As a result anyone deciding to develop a Greek-English cross-language question answering system would face many problems and would have to change strategies over and over again to achieve maximum results, given the resources available.

1.2 Goal of the Thesis

The goal of our work is to perform experiments in order to determine which strategies work better over others by performing a number of experiments, given the tools that are available and the particularities of the Greek Language.

For example, given the question "Πότε πέθανε ο Νίξον" ("When did Nixon die") the system would first send it to a translation mechanism and get back "died Nixon". The system would then reformulate the result from the search engine using simple word permutations and send it to a search engine in order to get back relevant documents.

Many of the current cross-language QA systems use a translation mechanism in order to convert the language of the original question to the language of the corpus and some translate it again back to the language of the original question to display the answer in a way the user can understand it.
It is clear that the translation mechanism plays a very important role in the efficiency of the system, since the core of the QA system will take the output of the translation mechanism as input. If the input is of low quality the output of the QA system will probably be of low quality too.

The issue here is to measure the quality loss from the translation mechanism. In other words to compare the efficiency of the cross-language QA system to the efficiency of the monolingual version.

1.3 Organisation of the Thesis

The thesis is organized in the following way: In chapter 2, we provide a review of research papers that concern both uni- and cross-language systems that gave us ideas we have used in our experiments. In chapter 3, we provide a description and the results of our experiments. In chapter 4, we propose some future work that could be done based on our research.

2 Literature Review

2.1 Unilingual Question Answering

2.1.1 The TREC Tracks

The Text REtrieval Conference (TREC) [13], was started in 1992. Its purpose is to support research in the information retrieval community by achieving the following goals:

- encourage research in information retrieval;
- increase communication among industry, academia, and government;
- speed the transfer of technology from research labs into commercial products;
- increase the availability of evaluation techniques for use by the industry and academia.

A TREC workshop is a set of "tracks" (areas of focus) in which particular retrieval tasks are defined. They serve several purposes. First, they often define the problem in new research areas and also demonstrates the performance of retrieval technology. In the end, the tracks make TREC attractive to a broader community by providing tasks that match the research interests of more groups.

2.1.2 The Brill System

In [1] the authors indicate the benefits of using the web as a corpus instead of other document collections, like the TREC corpus, which consist of less than 1 million documents.

The first benefit of the web is its size. Today, the web has more than 8 billion web pages [10], a huge number compared to any other corpus. With such a large number of documents, redundancy will occur very often and redundancy is very useful in QA. For example, it allows a QA system to use simple query rewrites meaning that the greater the number of information sources we can draw from, the more useful the task of rewriting the question (a technique widely used in QA [1]) becomes, since the potential answers are more likely to be expressed in different manners. Another advantage that the redundancy of the web has to offer is that it facilitates answer mining in case it is not obvious to Brill's system. In such a case the system will have the ability to give more confidence to the most frequent answers found in the corpus based on the assumption that a piece of information is more credible over another piece of information if it is published by more sources. This assumption is based on the notion of majority and is one way of weighting information credibility.

In general what is proposed in the paper is that question-answering systems do not have to perform difficult tasks like mapping questions to answers by way of uncovering complex lexical, syntactic, or semantic relationships between question string and answer string if the source is large enough to give many possible answers. The whole concept is based on a recent observation in natural language processing that, for many applications, significant improvements in accuracy can be attained simply by increasing the amount of data used for learning. [1]

A very good example of how having a huge source can significantly reduce the complexity of the system is the way Brill's system rewrites queries. To start with, there exist 7 categories (<Person>, <Location>, <Organization>, <Time>, <Currency>, <Measure>, <OTHERS>) of answers according to the question given. For example for the question "When did Abraham Lincoln die?" the system should look for an answer of type <DATE>. Depending on the category, [1] defines from 1 to 5 rewrite rules which are output as a set of triples: [<string>, <L/R>, <weight>]. Where <string> is the query, <L/R> is the position in the text where we expect the answer and <weight> reflects how much the answer from this query is preferred.

The only tool used is a lexicon to determine parts-of-speech of the words of the question and morphological variants. The technique used for rewriting the query is simple string-based manipulation. For example a specific category of questions requires changing the position of the verb in the sentence.

All possible combinations are tried. This means that for the question "Who is the president of the United States" the system would create:

- is The president of the United States
- The is president of the United States
- The president is of the United States
- The president of is the United States
- The president of the is United States
- The president of the United States is

by moving the verb of the question one position at a time.

For each query, a rewrite is generated and is sent to the search engine (Google). From the search engine summaries, 1- 2- and 3-grams are mined. In order to improve the results, the n-grams are filtered and weighted according to rules and then tiled in order to merge similar answers and assemble longer ones.

In addition to developing this strategy, some experiments were performed to judge the performance and the efficiency of the system. Also, a comparison was made using the system with the web as a corpus and TREC as a corpus.

The approach used in [1] is very similar to our approach since both are using the web as a corpus, TREC questions and brute force rewrite generation.

2.1.3 The Quantum System - The Monolingual Version

The monolingual English version of Quantum [4], which was designed to compete in the TREC QA track, like most question answering systems, is composed of three major components.

A. The question analysis component.

B. The passage retrieval component.

C. The answer extraction component.

A. Question Analysis

The goal of this component is to determine the expected type of the answer to a particular question. Some of the extraction functions require the determination of an additional parameter, the question focus.

The question focus is a single word or a set of words that is contained in the original question and is closely related to the answer. For example the answer of the question "With what radioactive substance was Eda Charlton injected in 1945?" should be a hyponym of the word "substance" which is the focus of this question.

Quantum must perform several operations like tokenization, POS[2] tagging and NP-Chunking. The analysis itself is performed by a set of 60 patterns and rules based on words. For example, Quantum uses the following pattern and rule to analyze the question: "How many people in the USA do not have health insurance?" is:

How many <noun-phrase NP1> → type = cardinality, focus = NP1

meaning that this question matched the pattern "How many" followed by a noun phrase and for this pattern the expected type of answer is a number (e.g. 20 million) that is expressing "people" which is the focus of the question.

B. Passage Retrieval

Since the answer extraction mechanism is too complex to be performed on the whole document collection, retrieval of relevant passages is required. For this, a classical search engine is used. Quantum uses OKAPI [3], since OKAPI allows the system to retrieve paragraphs instead of whole documents.

The 20 most relevant paragraphs are retrieved along with their relevance score calculated by OKAPI.

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[2] part-of-speech. See list of acronyms.

C. Answer Extraction

For the answer extraction component, three techniques are used: regular expressions, WordNet [4] and the Annie named entity extractor from the GATE suite [4]. WordNet is used to identify the validity of a potential answer. For example "37,000,000 Americans don't have health insurance" could be a potential answer to the previous question since "Americans" is a hyponym of "people" which is the focus of the question: "How many people in the USA do not have health insurance?". Each potential answer is then scored and the three best-scoring NPs are retained as candidate answers since 98% of the questions in past TREC campaigns had NPs as their answers.

2.2 Cross Language Question Answering

2.2.1 The CLEF Competition

The Cross-Language Evaluation Forum (CLEF) [11] is responsible for developing a framework for testing and evaluation of information retrieval systems for European languages in monolingual and cross-language contexts. Also, CLEF is responsible for providing data for testing purposes which can be used by system developers for benchmarking.

The goal is to create a community of scientists studying the same problems and to support future collaborative initiatives between groups with similar interests.

2.2.2 The Diogene System

According to the authors, Diogene is the first attempt to develop a QA system capable of dealing with Italian and English, both in monolingual and cross language scenarios [2]. To develop the system, the authors used 200 evaluation queries that were sought through the 193 MB document collection of the La Stampa newspaper and the 85 MB corpus of the 1994 SDA agency for the Monolingual Italian part (M-I). For the Bilingual Italian/English Part (B-I/E) the target collection was composed of English texts, the 425 MB corpus of the 1994 Los Angeles Times.

The Diogene system, like other QA systems, is composed of three major components:

- The Question Processing Component
- The Search Component
- The Answer Extraction Component

The Question Processing Component is composed of the following subcomponents:

Tokenization and POS Tagging:

The question is tokenized and the words are disambiguated with respect to their lexical category.

Multiword Recognition:

About 5,000 multiwords (collocations, compounds, complex terms) have been automatically extracted from a monolingual Italian dictionary and recognized by pattern matching rules.

Answer Type Identification:

In order to identify the answer type, 250 rules were defined manually. These rules take into account the presence of particular words, the words of a given part of speech and the words belonging to a given semantic category.

Keywords Extraction:

A stop words filter was applied to isolate a set of "Basic Keywords" cutting off from the input question both non-content words and non-relevant content words.

At the end of the Question Processing Component the keywords are either passed directly to the Keyword Expansion Subcomponent in M-I mode or to the keyword translation subcomponent in B-I/E mode.

Keywords Translation (Only for B-I/E):

Diogene translates keywords word-by-word and is not using a translation mechanism to do whole sentence translation.

The first thing that DIOGENE does is to extract all possible translations for each Italian keyword using the Collins Italian/English dictionary. In the case that no translation is found in the dictionary, MULTIWORDNET [14] is used for translation If again no translation is achieved and the word is capitalized, it is left

as it is. If the word is not capitalized, not found in the Collins dictionary and not found in MULTIWORDNET, it is skipped.

After that, Diogene tries to estimate the probability of every translation in order to find the most "popular". Diogene performs all possible combinations of the translations and they are searched in the target Corpus (English). All paragraphs that contain at least one English translated word per Italian word are returned. Next, from the paragraphs that were obtained from the search, translation combinations and their frequency are extracted and the most "probable" translation is finally used. The probability of the translation is calculated by frequency / NumberParagraphsInCorpus.

Keyword Expansion:

Both for the B-I/E and the M-I, keywords are passed to the keyword expansion subcomponent. The search component first combines the question keywords and their expansions in a Boolean query. It then retrieves documents accessing the target corpus by using Managing Gigabytes (MG) an open source indexing and retrieval system that offers a number of advantages like the ability to execute Boolean queries [2] such as: "[Shapour AND Bakhtiar AND (die OR dies OR died OR dying OR death OR deaths)]". After the search, relevant paragraphs are retrieved and are stored to be processed by the answer extraction component.

Answer Extraction Component:

Once the relevant paragraphs are retrieved, the answer extraction component performs a selection of answer candidates through named entities recognition.

Next, automatic answer validation procedures are applied over the selected candidates to choose and rank them, according to the CLEF QA track guidelines. In the end the three final answers are returned by the system.

Results:

The results of Diogene are summarized in Table 2.

RUN	ANSWERS	R	W	U	X	No Correct Answer	Correct Answer	MRR
lrstex031mi	590	132	439	6	13	103	97	0.42
lrstex031bi	492	94	378	6	14	123	77	0.32
lrstst032mi	**582**	**153**	**410**	**7**	**12**	**101**	**99**	**0.45**
lrstex032bi	**526**	**113**	**402**	**2**	**9**	**110**	**90**	**0.40**

Table 2: Results of Diogene at CLEF-2003

Table 2 shows the number of answers that have been cosidered right (R), wrong (W), unsupported (U) and inexact (X). The 7th column shows the number of questions for which no correct answer was returned and the 8th column shows the number of questions for which at least one answer was found by DIOGENE. The last column shows the Mean Reciprocal Rank (MRR) obtained for each run.

2.2.3 The Quantum System – The Cross-lingual Version

To make Quantum Cross-Lingual, the authors have decided to maintain the English core of the system and translate only the question from French into English and the answer back from English into French [4]. They have chosen this approach over having a French core since more resources are available for the English language than the French (WordNet [15], Annie Linguistic Tools [16],

etc...) [3] and since the other approach would require the translation of documents retrieved which is an error prone task.

Nevertheless, the approach chosen required the modification of the first component, the question analysis component. The question analysis component received as input a French question, so the component should be modified in a way that would be able to identify the question type and the question focus in French. Once this is done, the question type and the English translation of the question focus are translated (by using an IBM2 statistical translation model) and passed to the next component, the answer extraction component. [3]

In order for relevant passages to be retrieved, the keywords of the French question should be translated into English too. This was done by using IBM1 translation model, which doesn't take the order of the words into account, and the translation was passed on to OKAPI for passage retrieval. [3]

The translation of the extracted answer was not done since it was not required for CLEF, but would be useful in order to make the system transparent to a French user. However such a task wouldn't affect the results significantly because of the nature of the answers. For example 25% of TREC's answers are named entities or dates, titles, numbers and do not require any translation at all.

Results

The monolingual version on the English CLEF 2003 questions obtained a MRR of 0.223 (exact answers, lenient evaluation[3]). At CLEF, the cross-language version of the system obtained a MRR of 0.161 on the French questions and English documents. The principal reasons for this 28% performance drop include the different French question analysis patterns, the focus translation and the keyword translation.

Also, there was a drop of 44% after a similar experiment was conducted on the TREC data. CLEF questions were easier to process because they included no definition questions (What is..., Who is...), thus there were less focus[4] words to translate. The TREC question set was also translated with Babel2 and then used with the original English system, but this approach dropped the performance even more (53%). The MRR was not given.

2.2.4 The BiQue System

Another interesting cross-lingual system is BiQue [5] which works for German questions on an English document collection.

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[3] An evaluation strategy that does not take into account the source of the answer. As long as the system has the right answer, it is considered right regardless of what document it was found in.

[4] Introduced previously. Example: "How many people in the USA do not have health insurance?", The focus is "people".

System Overview

Document retrieval

For the document retrieval, the MG system (Managing Gigabites) was used [5]. In order to use MG with the CLEF QA track some modifications were needed in order for MG to be able to retrieve paragraphs instead of documents.

Shallow syntactic processing

The queries and the paragraphs retrieved by MG were analyzed using a shallow processing tool that consists of several integrated components: a tokenizer, a part–of–speech tagger, a morphological analyser and a phrase recognizer.

Query processing

The main tasks of the query processor are the

1. Parsing of a German (or English) NL question
2. Translation and expansion of the German query object to an English one.

A query object is a tuple (EAT,BoO,Keys,L) consisting of the Expected Answer Type EAT, the BoO (bag of objects) representation of the question, the set of relevant keywords used as query for the full–text retrieval engine MG, and the language identifier. The EAT is "what to expect" as an possible answer as is formed by the combination of the focus of the question and the question type.

Next a BoO (Bag of Objects) representation is constructed based on all words of the question. The BoO is a group of n objects "O" consisting of a word form, a lemma, part–of–speech, named entity and weight. The weight of an object is calculated during the matching phase of the query with an answer sentence.

In the end the query translation and expansion component retrieves English paragraphs.

Answer Pre-processing

The keywords of the translated query are used to build a query expression for the MG system. The most 100 relevant documents with respect to the query are returned by MG. The number was limited to 100 due to performance reasons.
For the answer selection, all paragraphs are analysed and mapped to a sequence of sentence objects. Each sentence object is checked whether it contains type–compatible elements with the expected answer type of the query object. If it's the case, the weight of the sentence is increased. In the end, each sentence is scanned for an NP phrase which could be the exact answer of the question.

Question translation and expansion

Instead of using a single translation engine, the system uses three different resources. [5]

- FreeTranslation (via http://www.freetranslation.com/)
- AltaVista (via http://babel.altavista.com/)

- Logos (off–line)

The question is sent to all three above mentioned resources and 3 translations are constructed, one from each. The system then uses all open-class words from all translations to construct the BoO.

For the question expansion task, the German and English WordNets were used. The goal was to extend the English BoO collection with synonyms for the words that are present in the WordNet.

Results

For the lenient evaluation the system scored an MRR of 0.15. For the strict evaluation, the system scored an MRR of 0.145. According to the authors this is surely a result that should and can be improved. In order to increase results tools and techniques could be used like the unsupervised online learning of more fine–grained named entities rules, methods for determining the utility of answer candidates, machine learning of query grammars, development of ontology based answer validation methods, and more controlled query expansion by using fine–grained ontologies.

2.3 Conclusion

Comment:
Outline Landscape out there?

Position the ones described here?

How they compare

In this chapter, we have described the most interesting systems for our project and we will use these ideas as a starting point for our cross-lingual Greek-English QA system.

3 Our Experiments

In this chapter we will present several experiments that we performed, in order to evaluate techniques for a Greek-English QA system. This way, researchers that will in the future develop such a system will know the advantages and disadvantages of each technique.

3.1 Experiment 1: A Monolingual Baseline

3.1.1 Introduction

The vast information the web has to offer (4.285.200.000 documents) [10] can be used by QA systems as a corpus greater than any other there exists (for example the TREC corpus contains 1,000,000 documents). The web allows us to use redundancy and simple query rewrites to facilitate answer mining [1]. It is clear why the field of web-based QA system is becoming more and more popular and will continue to grow as the web grows and has more information to offer.

A very important tool that is used by all web-based QA systems are search engines. Search engines are used to retrieve documents that contain the question's set of words or the question's rewrite (reformulation of the question) set of words and narrow down the search for the answer.

As we can understand, the performance of a web-based QA system is much dependent on the performance and efficiency of the search engine and this is why it is critical to use the search engine that responds better to the task web-based QA systems assign them.

3.1.2 Goal

In [1], Brill argues and shows the usefulness of rewrites in a web-based monolingual environment. In order to evaluate the use of brute force rewrites for a web-based question answering system we had to simulate the way a web-based QA system would work. Thus, we have created a generic QA system that takes a question, determines its question type, removes the question words, generates a number of rewrites, sends these rewrites to the search engine and measures each result returned. This allows us, in a first step to evaluate how rewrites are useful in a monolingual environment, thus giving us a comparison point for our cross-lingual experiments.

3.1.3 System Description

3.1.3.1 The questions set

The best way to evaluate the use of rewrites would be to use TREC's questions, because they are standard in the field and the correct answer for each question is available. We have used all questions from TREC-8, 9, 10 and 11. In total we have used 1893 questions and for each question we had an answer pattern provided also by TREC. An example is the following:

No	Question	Answer Pattern
1	Who is the author of the book, "The Iron Lady: A Biography of Margaret Thatcher"	Young
2	What was the monetary value of the Nobel Peace Prize in 1989?	\$469,000
3	What does the Peugeot company manufacture?	405? automobiles? diesel\s+motors? 309s?

		106s? 504s? 505s? 205s? 306s? vehicles? cars? Peugeots plastic\s+components

3.1.3.2 Determining the question type

In order to determine the question type and question word we have used the question type classification of [6] computed from the TREC-8 question set. This includes 12 types of questions. These are shown in Table 3.

Question Word	No of Questions in TREC-8-11
What	1030
Who	260
When	168
Where	161
How+Adj	118
Which	49
Basic How	40
Name	26
Unidentified	21
How+Much+<Modifier>	9
Why	8
Whom	3
Total	1893

Table 3: Question Types in TREC 8-11

After determining the question types, we have removed the question words (What, who, when, where, how+Adj, basic how, which, name, how much+<modifier>, whom...) and generated the rewrites.

3.1.3.3 Rewrite Generation

In order to generate the rewrites we have performed word permutations with the question words similarly to Brill's approach [1]. If the question contained a group of quoted words, then the quoted part was handled as one word. For example in question no 1, *(Who) is the author of the book, "The Iron Lady: A Biography of Margaret Thatcher"?* we have 7 words and not 14. (Note that the word "Who" had been removed from the question type determination part). This is done because quoted parts in a question represent titles or quotes that should be searched as they are since they are expected to be found exactly as they are. So, not treating quoted parts as one word could cause additional problems like a large number of invaluable rewrites or misleading rewrites.

In order to ensure the greatest recall it would be best to generate all possible combinations with the words of the questions, but this would be almost impossible since the number of rewrites that would be generated for each question would be n! (where n is the number of words contained in the question). For example, with the Margaret Thatcher question, it would produce 5040 rewrites and the question no 8 *"(What) is the name of the rare neurological disease with symptoms such as: involuntary movements (tics), swearing, and incoherent vocalizations (grunts, shouts, etc.)"* would produce 1,124,000,727,777,607,680,000 rewrites. So we had to find another way to generate the rewrites.

It would be enough to determine the verb or verbs in the question and try to move them around in the sentence, a technique widely used in question reformulation [1] that would allow us to perform the evaluation needed.

In order to identify the verb we should ideally use a POS tagger, but because this evaluation would be used to compare our cross-lingual Greek-English system and (at the time) we did not have a Greek POS tagger, we have assumed that every word in the question could be a verb and have moved around every word to every position, one at a time.

For example, for question no 1 - "Who is the author of the book, "The Iron Lady: A Biography of Margaret Thatcher" - , we have generated the following rewrites:

1 is the author of the book The Iron Lady A Biography of Margaret Thatcher
2 the is author of the book The Iron Lady A Biography of Margaret Thatcher
3 the author is of the book The Iron Lady A Biography of Margaret Thatcher
4 the author of is the book The Iron Lady A Biography of Margaret Thatcher
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34 is the author The Iron Lady A Biography of Margaret Thatcher of the book

35 is the author of The Iron Lady A Biography of Margaret Thatcher the book

Remember that the quoted part of the question is handled as one word. Also the pattern is not obvious here since script removes dublicate rewrites.

We applied this method to all 1893 TREC (TREC 9-11) questions and we obtained 65,125 rewrites. This can be seen in Table 4.

TREC	No of Questions	No of Rewrites	Avg. Rewrites / Question
8	200	15381	76,9
9	693	20512	29,5
10	500	12536	25,0
11	500	16696	33,3
	1893	65125	34,4

Table 4: Rewrites per TREC

In order to distinguish the useful from the useless rewrites we have send all 65,125 to the search engine **quoted** (including the stop words) to see the number of documents returned. For example when these rewrites were sent to Google, only 4,311 rewrites generated at least 1 result, meaning at least 1 document containing information relevant to the question's words. All other returned 0 results probably because they were ungrammatically.

In order to evaluate the quality of the retrieved documents (i.e., if indeed the document contained the answer), we then wanted to test the first 20 documents returned by the search engine for each question.

However, since each question generated one or more rewrites that returned one or more documents, most questions returned a number of documents larger than 20. On the other hand some question returned less than 20 documents (remember that the questions were sent quoted to the search engine).

So, we were faced with the problem of deciding which results we should take into account, from which rewrites and what to do if the total number of results for a question was less or more than x.

To solve this problem we have assumed that the rewrites of a question that returned more documents than others should be given a greater weight. For example for question no 1 we retrieved the following results from Google:

Question No	Rewrite	Number of Documents Retrieved
1	is the author of the book The Iron Lady A Biography of Margaret Thatcher	48
1	the author of the book The Iron Lady A Biography of Margaret Thatcher is	46

Question no 1 had only 2 good rewrites. The first returned 48 documents and the other returned 46 documents. So if we wanted to evaluate the first 20 documents (x=20) we used int(48/94*20)=10 documents form the first rewrite and int(46/94*20)=9 for the second rewrite for a total of 19.

In the case where the total was less than x (19<20) because of the rounding or because the total number of results was less than x, we used the results we got from the first rewrite, but unquoted.

So in our example, the documents used for x=20 were the first 10 documents returned by Google for the query "is the author of the book The Iron Lady A

Biography of Margaret Thatcher", the 9 first results of the query "the author of the book The Iron Lady A Biography of Margaret Thatcher is" and the first result from the query -is the author of the book The Iron Lady A Biography of Margaret Thatcher- (unquoted).

Also another problem that we did not face with the questions we have used, but could appear with other questions, would be the case were for a question, the total number of "usefull" rewrites (rewrites that returned results when sent to the search engine) is larger than x. In such a case we would chose the x first rewrites that returned more results and use the first result of each one, based again on the assumption that rewrites that returned more results should have a greater weight over others rewrites.

3.1.3.4 Searching for the answer

For each of the results we wanted to measure

1) the number of times the answer was found anywhere in the search engine snippet
2) the number of times the answer was found in the search engine snippet but with respect to the rewrite meaning right before, right after or in the same sentence with the rewrite.
3) the number of times the answer was found anywhere in the source document and
4) the number of times the answer was found anywhere in the source document but in respect to the rewrite.

To determine this we used PERL's pattern matching functions by using the regular expressions provided by the TREC pattern set.

Counting the number of correct answers found for questions that had only one correct answer, such as question no 1 (Young) was straightforward. However, questions like no 3 "What does Peugeot manufacture" had several possible correct answers according to TREC (405?, automobiles?, diesel\s+motors?, 309s?, 106s?, 504s?, 505s?, 205s?, 306s?, vehicles?, cars?, Peugeots plastic\s+components) we have reformed the regular expressions in one regular expression using "or".

(405? | automobiles? | diesel\s+motors? | 309s? | 106s? | 504s? | 505s? | 205s? | 306s? | vehicles? | cars? | Peugeots plastic\s+components)

For finding the answers with respect to the rewrite we had to modify again the regular expression in a way where the answer could be only found right before, right after, between and in the same sentence with the rewrite.

3.1.4 Results

We began our experiment by applying all scripts on Google by measuring the first 20 documents (x=20) and then the first 10 documents (x=10).

Google was chosen for various reasons. The first reason is that it is the fastest search engine and this would reduce our time significantly. Also Google has the largest database of documents (over 4 billion documents) [8] and uses the most sophisticated page ranking methods [1].

For questions containing more than 10 words, our result selection strategy did not work very well because Google only takes in to account the first 10 words of a query and ignores the rest. So for example, for the question "What was the name of the US helicopter pilot shot down over North Korea", the rewrites that obtained at least one result are:

Rewrites	No of Documents Returned
was the name of the US helicopter pilot shot down over Korea North	12
was the name of the US helicopter pilot shot down Korea over North	12
was the name of the US helicopter pilot shot down over North Korea	12
was the name of the US helicopter pilot shot down North over Korea	12
was the name of the US helicopter pilot shot down North Korea over	12
the name of the US helicopter pilot shot down over was North Korea	12
the name of the US helicopter pilot shot down over North Korea was	12
the name of the US helicopter pilot shot down over North was Korea	12

Table 5: Number of Results Generated for the Question: "What was the name of the US helicopter pilot shot down over Korea North"

Actually there are not 8 useful rewrites but only 2 since Google only sees the 10 first words: "was the name of the US helicopter pilot shot down" and "the name of the US helicopter pilot shot down over".

As a result if X was equal to 10 we wouldn't use 5 results from the first rewrite and 5 from the second rewrite as we should have done according to our algorithm. Instead we would use 1 result from each of the 8 rewrites, thus we would use the same results again and again as different ones.

1,521 questions where used to evaluate the documents found by Google. As we show in Table 3, these include the TREC-8 - TREC 11 questions.

TREC	No of Questions Used
TREC-8	191

TREC-9	638
TREC-10	481
TREC-11	211
TOTAL	1521

Table 6: Number of Questions Used per TREC for the Evaluation of the TREC-8 – 11

372 questions of the TREC-8 – TREC11 questions were not used either because TREC provided no answer patterns for them or because they produced far too many rewrites.

Table 7 to Table 15 show the results of the evaluation.

In the following tables a number of abbreviations are used to display the results:

SN	Answer found in snippet
SNR	Answer found in snippet with respect to the rewrite (Right Before or right after)
DOC	Answer found in source document
DOCR	Answer found in source document with respect to the rewrite

For the question "Who is the president of the united states?" and for the rewrite "is the president of the united states" we give the following cases that did qualify for each category (SN, SNR, DOC, DOCR).

Example for SN: (Result from Google, Google Snipet)
US CITIZENSHIP TEST
... Q: Who was the first President of the United States? A: George Washington; Q: Who **is the president of the United States** today? A: George W. Bush; ...
www.shusterman.com/100.html - 15k - Cached - Similar pages

Example for SNR: (Result from Google, Google Snipet)
New York State Elementary Test Prep- ELA 4- Grade 3 Capitalizing ...
... Click To Preview. George w. Bush **is the President of the united States** of America. George W. Bush **is the President of the United States** of America. ...
www.oswego.org/testprep/ela4/h/capitalsent.cfm - 14k - Cached - Similar pages

Example for DOCR: (http://ask.yahoo.com/ask/20010605.html) Rank 1 in Google.

"Dear Yahoo!: How much is the president of the United States paid? *Jack Hemet, California* **Dear Jack:** We knew the presidential salary had been $200,000 for a number of years -- a relatively paltry sum considering the state of executive compensation these days -- but we were unsure of the salary our current president is drawing. We seem to recall hearing something a few months ago about a raise for our country's commander in chief.

We searched on "presidential salary," and on the first page of search results we received several relevant web sites and one amusing anomaly.

According to a **CNN article** dated July 16, 1999, the House voted earlier that week to increase the next president's salary to $400,000, which means **George W. Bush**, our 43rd president, makes twice as much as his predecessor, President Clinton. "

Example for DOCR: (http://www.youngturk.com/Articles/EnemyWithin.htm) Rank 14 in Google.

"This might be curious oddity in a land full of oddities. One might think, America has many fringe groups, but they don't pose as real a threat as Muslim extremists. The only problem with that hypothesis is that the fringe fundamentalist group in the United States has actually seized power. Tom DeLay is the Republican House Majority Leader. John Ashcroft is the head of the Justice Department. And **George W. Bush is the President of the United States of America** and the Commander in Chief of the largest army the world has ever seen."

	X=20			
TREC-8	[illegible]	SNR	DOCR	[illegible]
ALL	22,58%	0,007%	44,43%	4,17%
8	8,76%	0,00%	38,36%	3,00%
9	15,32%	0,00%	39,47%	2,93%
10	28,08%	0,02%	49,58%	4,86%
11	35,42%	0,00%	52,15%	7,28%

Table 7: Answers Found in Documents Returned – X = 20

	X=10			
TREC-8	[illegible]	SNR	DOCR	[illegible]
ALL	21,54%	0,006%	44,78%	3,82%
8	15,57%	0,00%	38,33%	2,63%
9	14,99%	0,00%	40,14%	2,58%
10	27,09%	0,02%	49,53%	4,45%
11	34,91%	0,00%	54,26%	7,40%

Table 8: Answers Found in Documents Returned – X = 10

On average, about 1 document out of 2 contains the expected answer (see the DOC figure), while 1 snippet out of four contains the answer (see the SN figure). However, identifying the answer using only the re-write with no further checking (ex. NP or named entity tagging) seems useless (see the SNR and DOCR figures). Although the brute force approach that was used creates a large number of ungrammatical re-writes, we expected these not to be found in the document collection, hence, not affect the results that much.

As Table 7 and Table 8 show, the number of documents retrieved (the value of X) does not seem to affect the results significantly.

X=20					
Q TYPE	SN	DOC	SNR	DOCR	No of Questions
Basic How	12,79	25,37	0,00	0,63	477
How+Adj	16,67	32,35	0,00	2,51	1632
How+Much+<Modifier>	27,44%	35,37%	0,61%	10,98%	164
Name	11,93%	39,91%	0,22%	3,69%	461
Unidentified	11,96%	34,97%	0,00%	0,00%	326
What	23,54%	43,88%	0,00%	3,82%	13103
When	20,81%	43,64%	0,00%	4,32%	2177
Where	21,11%	56,06%	0,00%	5,46%	2492
Which	25,41%	51,16%	0,00%	0,66%	303
Who	27,44%	48,56%	0,00%	6,16%	3849
Whom	5,88%	23,53%	0,00%	0,00%	17
Why	4,72%	28,35%	0,00%	0,79%	127

Table 9: Answers Found in Documents Returned by Question Type – X = 20

X=10					
Q TYPE	SN	DOC	SNR	DOCR	No of Questions
Basic How	12,04	25,75	0,00	0,67	299
How+Adj	15,75	32,62	0,00	1,93	984
How+Much+<Modifier>	27,78	36,67	1,11	10,00	90
Name	12,40	42,25	0,00	4,65	258

Q-TYPE					No of questions
Unidentified	14,29	38,42	0,00	0,00	203
What	22,73	44,09	0,00	3,62	7809
When	19,16	44,57	0,00	3,67	1279
Where	20,25	57,30	0,00	4,52	1417
Which	25,82	52,58	0,00	0,47	213
Who	25,04	48,10	0,00	5,83	2264
Whom	10,00	10,00	0,00	0,00	10
Why	6,25	35,00	0,00	1,25	80

Table 10: Answers Found in Documents Returned by Question Type – X = 10

Table 9 and Table 10 indicate that for some question types it is easier to find relevant documents and passages than others. For example "when" questions return twice as much relevant documents over "whom" questions indicating that when questions are easier to answer probably because they are grammatically and semantically simpler and by extension the rewrites produced have a greater chance to be found in th corpus.

This big difference indicates that it might be a good solution to adjust the strategy that a system retrieves relevant documents according to the question word. For example for "whom" questions we could increase the value of X.

TREC				
ALL	63,44%	0,13%	85,73%	27,81%
8	61,25%	0,00%	91,09%	21,98%
9	59,87%	0,00%	86,78%	20,06%
10	64,86%	0,41%	85,23%	32,22%
11	72,98%	0,00%	82,93%	46,44%

Table 11: Questions Answered (No of questions for which at least one document contained a correct answer) – X = 20

ALL	56,27%	0,06%	82,57%	21,10%
8	52,35%	0,00%	86,91%	16,23%
9	53,29%	0,00%	83,07%	14,89%
10	56,13%	0,20%	80,04%	24,11%
11	69,19%	0,00%	82,93%	44,07%

Table 12: Questions Answered (No of questions for which at least one document contained a correct answer) – X = 10

Table 11 and Table 12 show that simple rewrites together with search engines perform good if we consider that for about 85% of the questions at least one document was found that contained the correct answer for the answer extraction component to find. Also for about 1 out of 4 questions the system retrieved documents that contained the answer in the same sentence with the rewrite, meaning easier for the answer extraction component to find.

Basic How	38,71%	64,52%	0,00%	6,45%	31
How+Adj	41,75%	73,79%	0,00%	15,53%	103
How+Much+<Modifier>	44,44%	66,67%	11,11%	33,33%	9
Name	50,00%	96,15%	3,85%	26,92%	26
Unidentified	85,71%	90,48%	0,00%	0,00%	21
What	63,40%	84,91%	0,00%	24,53%	795
When	63,36%	85,50%	0,00%	32,06%	131
Where	73,43%	92,31%	0,00%	45,45%	143
Which	65,22%	86,96%	0,00%	8,70%	23
Who	70,87%	91,74%	0,00%	39,13%	230
Whom	100,00%	100,00%	0,00%	0,00%	1
Why	50,00%	87,50%	0,00%	12,50%	8

Table 13: Questions Answered by Question Type (No of questions for which at least one document contained a correct answer) – X= 20

Basic How	32,26%	64,52%	0,00%	6,45%	31
How+Adj	38,83%	73,79%	0,00%	11,65%	103
How+Much+<Modifier>	44,44%	66,67%	11,11%	33,33%	9
Name	42,31%	76,92%	0,00%	26,92%	26
Unidentified	85,71%	95,24%	0,00%	0,00%	21
What	55,60%	81,89%	0,00%	19,62%	795
When	58,02%	83,97%	0,00%	19,85%	131
Where	63,64%	90,91%	0,00%	30,77%	143
Which	65,22%	86,96%	0,00%	4,35%	23
Who	62,61%	85,22%	0,00%	30,00%	230
Whom	100,00%	100,00%	0,00%	0,00%	1
Why	50,00%	75,00%	0,00%	12,50%	8

Table 14: Questions Answered by Question Type (No of questions for which at least one document contained a correct answer) – X= 10

Again, as in Table 11 and Table 12, Table 13 and Table 14 show that different question types perform different than others. For example, "who" questions always perform better than how question, again because "who" questions and answers are grammatically and semantically simpler than "how" questions and answers.

3.1.4.1.1 Other Interesting Statistics

As Table 15 shows, 21% of the URLs used (5,310 URLS) contained the word TREC, indicating that at least 21% of the results returned by Google concerned TREC or other educational and research organizations. This is not good since it affects our results negatively because for most of these URLs the question is there (returned by Google), but not the answer since the document refers to a TREC question and not to events related to the question itself.

URL	Hits
http://l2r.cs.uiuc.edu/~cogcomp/Data/QA/TREC9questions.txt	540
http://misshoover.si.umich.edu/~zzheng/qa-new/TREC9.shtml	525
http://TREC.nist.gov/data/qa/T9_QAdata/original_answers	451
http://www.answerbus.com/corpus/TREC10.shtml	415
http://TREC.nist.gov/data/topics_eng/qa_questions_201-893	394
http://l2r.cs.uiuc.edu/~cogcomp/Data/QA/TREC10questions.txt	386
http://TREC.nist.gov/data/qa/2001_qadata/main_task_QAdata/qa_main.894-1393.txt	338
http://l2r.cs.uiuc.edu/~cogcomp/Data/QA/QC/TREC_10.label	337
http://www.answerbus.com/corpus/TREC-8.shtml	317
http://TREC.nist.gov/data/qa/2001_qadata/main_task_QAdata/original_answers	278
http://l2r.cs.uiuc.edu/~cogcomp/Data/QA/TREC-8questions.txt	257
http://TREC.nist.gov/data/qa/add_QAresources/TREC-8_answerkey.txt	192
http://TREC.nist.gov/data/topics_eng/topics.qa_questions.txt	179
http://TREC.nist.gov/data/qa/2002_qadata/main_task_QAdata/t11_500_numbered.txt	118
http://l2r.cs.uiuc.edu/~cogcomp/Data/QA/QC/train_1000.label	105
http://www.answerbus.com/corpus/TREC9.shtml	99
http://medialab.di.unipi.it/Project/QA/work/question.html	71
http://misshoover.si.umich.edu/~zzheng/qa-new/	64
http://www.isi.edu/natural-language/projects/webclopedia/Taxonomy/taxonomy_toplevel.html	44
http://medialab.di.unipi.it/Project/QA/work/AnalizeQuestion.html	38

Table 15: TOP 20 URLs Returned by Google

3.1.5 Conclusion

This experiment shows what [1] argues, that when using the Web as a corpus, raw rewrite generation can performs well for monolingual systems.

TREC	SR	SDR	QAR	TQAR
ALL (8-11)	63,44%	0,13%	85,73%	27,81%

Table 11 shows that 85% of the documents contained a correct answer anywhere in the document and almost 28% of the documents contained a correct answer with respect to the rewrite. Note that this was achieved by using simple

word permutations with the question words. This numbers could easily improve with the use of NLP tools.

This experiment was useful, not only because it showed that raw rewrite generation performs well for monolingual systems but also because its results can be used for comparison with the results of the experiments we will perform for evaluating the raw rewrite generation strategy for cross-lingual systems.

3.1.6 Future Work

As a follow up to this experiment, it would be interesting to run the same test for the top 30 and top 40 documents in Google. By doing this we would be able to find the approximate dead point. The point at which using more documents that that wouldn't increase the results. We could, for example, discover that when using Google the optimal number of documents to fetch for "What" questions would be between x_min and x_max. Less or more than that would affect the efficiency of the search engine in relation to our QA system.

3.2 Cross-Lingual Experiments

3.2.1 Experimental Setup

In order to evaluate rewrites for a Greek-English Cross-Language QA system, we first translated TREC 8 questions (200 questions) used in the monolingual into Greek manually. Then we took the Greek translated questions and ran them through a translation engine to translate them back to English. Next we took the automatically generated English questions and run them through the monolingual QA search-engine used in the first experiment and evaluated the results with the same evaluation script (see section 2) with X=20. Finally we compared the results obtained from the script with the results of section 2 (the monolingual system).

The questions used to be translated into Greek manually were taken from TREC-8. The translation was not done in a way that tried to preserve "blindly" the original English question syntax, but in a way that the translated Greek question was fluent and represented the original English meaning.

Most of the proper names and title entities were preserved in English format.

For example, the following would make less or no sense to translate in Greek:

- Manchester United (Ενωμένη Μάντσεστερ)
- Docklands Light Railway (Ελαφρύς Σιδηρόδρομος του Ντόκλαντ)
- Big Mac (Μεγάλο Μακ)
- Miss Piggy (Δεσπινίς Πίγκυ)
- Star Trek (Αστρικό Ταξίδι)
- Stardust (Αστρική Σκόνη)
- Voyager Project (Πρόγραμμα Ταξιδιώτης)
- Lee Harvey Oswald (Λι Χάρβεη Όσβαλντ)

- Rostropovich (Ροστρόποβιτς)
- Shostakovich (Σοστάκοβιτς)
- Disneyland (Γη του Ντίσνευ - Ντίσνευλαντ)

The translation of TREC-8 questions in Greek can be found in Appendix 2.

The cross-lingual experiment was performed using 2 machine translation mechanisms:

- Translating the entire question using a translation system (Experiment 2)
- Translating the question word for word (Experiments 3, 4 and 5)

3.2.2 Experiment 2: Use of Systran

A web-based version of Systran can be found at http://Systran.otenet.gr.

We have developed a script in PHP that took the manually translated Greek questions, sent them to http://Systran.otenet.gr, retrieved the translated English version from Systran and stored them locally.

The translation of Systran for each TREC-8 question can be found at Appendix 3.

3.2.2.1 Results

Here again, the same measures were taken as with the monolingual version.

Recall that:

SN:	Answer found in Snippet
SNR:	Answer found in Snippet with respect to the rewrite
DOC:	Answer found in Source Document
DOCR:	Answer found in Source Document with respect to the rewrite

	SN	DOC	SNR	DOCR
Cross-Lingual (Systran)	7,20%	61,76%	0,00%	0,00%
Monolingual	61,25%	91,09%	0,00%	21,98%

Table 16: Answers Found for Questions

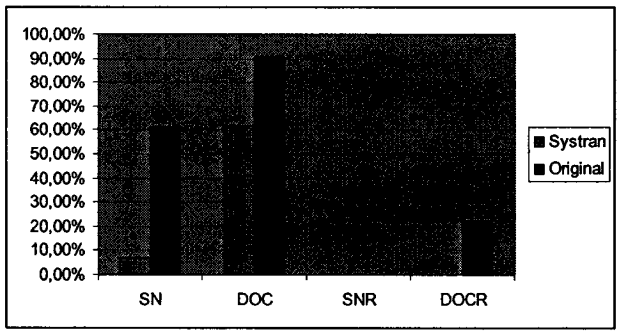

Figure 1: Graph for Answers Found for Questions

	SN	DOC	SNR	DOCR
Cross-Lingual (Systran)	2,32%	6,42%	0%	0%
Monolingual	8,76%	38,36%	0,00%	3,00%

Table 17: Answers Found for Results

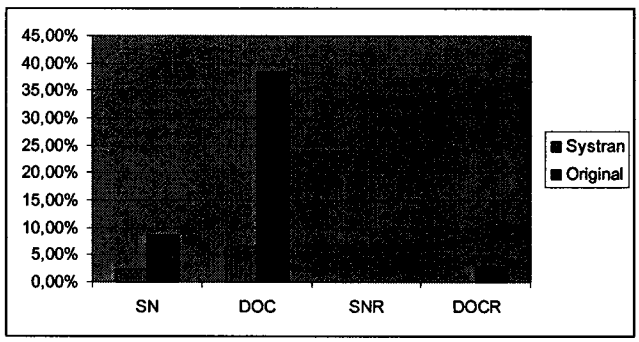

Figure 2: Graph for Answers Found for Results

	No of Rewrites	Avg. Rewrites / Question
Systran	16.793	83,965
Original	15.381	76,905

Table 18: Rewrites for TREC-8

Systran questions produced more rewrites / question meaning that the questions contained more words. This is reasonable since the original to translated sentence length ratio is 0,9.

Question Type	Question Types Determined by Systran	Original Question Types
Basic How	0	1
How+Adj	22	27
How+Much+ModMod	6	2
Name	3	4
Unidentified	15	0
What	6	65
When	19	20
Where	8	21
Which	4	10
Who	108	47
Why	2	2
Whom	0	1
	193	200

Table 19: Question Type of TREC-8 as Determined by Systran

Table 19 indicates that systran was unable to correctly translate the question word since for most translated questions it gave a different question type than the original.

Answers found for results per Question type										
	Cross-lingual (Systran)					Monolingual				
Question Type	SN	DOC	SNR	DOCR	No. of Questions	SN	DOC	SNR	DOCR	No. of Questions
Basic How	-	-	-	-	-	10,00%	25,00%	0,00%	10,00%	20
How+Adj	0,00%	1,40%	0,00%	0,00%	428	9,64%	26,12%	0,00%	0,64%	467
How+Much+ModMod	0,00%	0,00%	0,00%	0,00%	105	0,00%	7,41%	0,00%	0,00%	27
Name	0,00%	10,00%	0,00%	0,00%	60	1,32%	30,26%	0,00%	1,32%	76
Unidentified	0,31%	7,84%	0,00%	0,00%	319	-	-	-	-	-
What	4,79%	12,57%	0,00%	0,00%	167	17,82%	36,94%	0,00%	2,40%	999
When	0,00%	3,13%	0,00%	0,00%	383	15,41%	35,74%	0,00%	4,26%	305
Where	3,95%	27,19%	0,00%	0,00%	228	20,11%	55,17%	0,00%	4,31%	348
Which	1,22%	1,22%	0,00%	0,00%	82	24,31%	56,94%	0,00%	0,69%	144
Who	3,27%	5,71%	0,00%	0,33%	2415	23,73%	40,53%	0,00%	4,93%	750
Whom	-	-	-	-	-	5,88%	23,53%	0,00%	0,00%	17
Why	0,00	0,00	0,00	0,00	40	7,50%	32,50%	0,00%	0,00%	40
AVERAGE	**1,35%**	**6,91%**	**0,00%**	**0,03%**		**12,34%**	**33,65%**	**0,00%**	**2,60%**	

Table 20: Answers Found for Results per Question Type

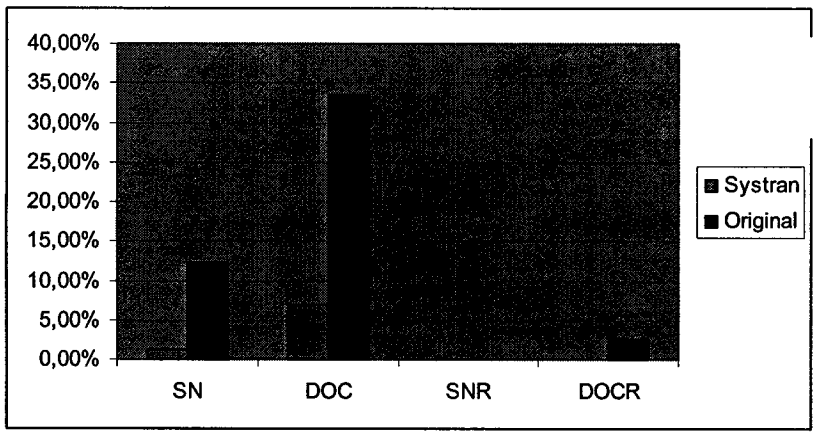

Figure 3: Graph for Answers Found for Results per Question Type

	Cross-lingual (Systran)					Monolingual				
Question Type	SN	DOC	SNR	DOCR	No. of Questions	SN	DOC	SNR	DOCR	No. of Questions
Basic How	-	-	-	-	-	100,00%	100,00%	0,00%	100,00%	1
How+Adj	0,00%	9,09%	0,00%	0,00%	22	48,15%	81,48%	0,00%	11,11%	27

	Cross-lingual (Systran)					Monolingual				
Question Type	SN	DOC	SNR	DOCR	Nr. of Questions	SN	DOC	SNR	DOCR	Nr. of Questions
How+Much+ModMod	0,00%	0,00%	0,00%	0,00%	6	0,00%	100,00%	0,00%	0,00%	2
Name	0,00%	33,33%	0,00%	0,00%	3	25,00%	100,00%	0,00%	25,00%	4
Unidentified	6,67%	20,00%	0,00%	0,00%	15	-	-	-	-	-
What	16,67%	50,00%	0,00%	0,00%	6	57,63%	89,83%	0,00%	16,95%	59
When	0,00%	15,79%	0,00%	0,00%	19	61,11%	77,78%	0,00%	33,33%	18
Where	25,00%	50,00%	0,00%	0,00%	8	71,43%	100,00%	0,00%	28,57%	21
Which	25,00%	25,00%	0,00%	0,00%	4	77,78%	100,00%	0,00%	11,11%	9
Who	8,33%	13,89%	0,00%	0,93%	108	68,09%	95,74%	0,00%	29,79%	47
Whom	-	-	-	-	-	100,00%	100,00%	0,00%	0,00%	1
Why	0,00%	0,00%	0,00%	0,00%	2	100,00%	100,00%	0,00%	0,00%	2
AVERAGE	**8,17%**	**21,71%**	**0**	**0,09%**		**64,47%**	**94,98%**	**0,00%**	**23,26%**	

Table 21: Answers Found for Questions per Question Type

The efficiency of Systran coupled with rewrites as a tool for a web-based Greek-English cross-language system is not ideal. In SN, the original (monolingual) questions are 597% more efficient in fetching the correct answer than from the Systran question and in DOC, the original questions are 377% more efficient in fetching the correct answer than the Systran ones. For SNR and DOCR the results are the same (0,00%) or when the original questions are <> 0,00% Systran's questions are = 0,00%

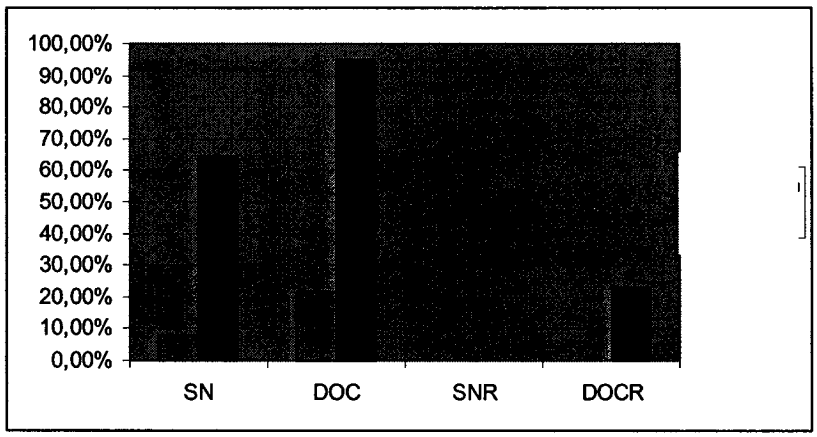

Figure 4: Graph for Answers Found for Questions per Question Type

The figures in Table 11 are higher because one question has many (20) results.

If one of these results got the answer we consider the question answered.

Original >> Syntax	Number of times	No of Questions	% of Failure
What >> Who	55	59	93,22%
Where >> Unidentified	12	21	57,14%
Which >> Who	10	10	100,00%
How+Adj >> How+Much+Mod	7	27	25,92%
What >> Which	3	59	5,08%
How+Much+Mod >> How+Adj	2	2	100,00%
Where >> Which	1	21	4,76%
Who >> Unidentified	1	47	2,12%
Basic How >> Unidentified	1	1	100,00%
What >> How+Adj	1	59	1,69%
Name >> Unidentified	1	4	25,00%
Whom -> Who	1	1	100,00%
	95		

Table 22: Bad Translations on Question Word

Original -> Translation	No of times
Who -> Who	46
How+Adj -> How+Adj	20

When -> When	20
Why -> Why	2
What -> What	6
Where -> Where	8
Name -> Name	3
	105

Table 23: Good Translations on Question Word

Table 22 and Table 23 indicate that systran was incapable of translating the question word correctly. On other hand the cases where it was succesfull were very few.

3.2.2.2 Other Interesting Statistics

From the 16,793 rewrites, only 34 (0,20%) produced some result when sent to Google in quotes. The rest produced results unquoted.

No of times used	URL
18	http://l2r.cs.uiuc.edu/~cogcomp/Data/QA/TREC-8questions.txt
17	http://www.answerbus.com/corpus/TREC-8.shtml
16	http://www.artcyclopedia.com/artists/ruisdael_jacob_van.html
16	http://www.artcyclopedia.com/scripts/tsearch.pl?t=Lefebvre&
15	http://www.esf.org/esf_venue.php?site=230
15	http://www.britrail.com/can/cf_britrail_can/britrail_tickets_content.cfm
14	http://www.artcyclopedia.com/artists/coypel_charles-antoine.html
14	http://www.wku.edu/~mooreca1/influential.html
14	http://216.239.53.104/search?q=cache:vSZEhmq_Gc8J:www.mod.uk/linked_files/MDP/tt112part2.pdf+%22killed+Lee+Harvey+Oswald+the%22&hl=en&ie=UTF-8
14	http://www.geocities.com/jfkinfo/jfk9/hscv9f.htm
14	http://members.xoom.virgilio.it/all42day/history/h4mar/h4mar14.html
13	http://TREC.nist.gov/data/qa/add_QAresources/TREC-8_answerkey.txt
13	http://www-rali.iro.umontreal.ca/LUB/TREC-en.txt
11	http://www.headstart-sc.org/mp.html
11	http://216.239.51.104/search?q=cache:4b_PhuJ4b0cJ:www.cencomfut.com/HS-Salary-Survey-2003.pdf+%22is+the+Head+Start%22&hl=en&ie=UTF-8
10	http://TREC.nist.gov/data/qa/T8_QAdata/topics.qa_questions.txt
9	http://espn.go.com/nba/columns/may/1116278.html
8	http://www.jockbio.com/Bios/Sampras/Sampras_bio.html
7	http://66.51.113.130/bio/1997wim.html

No of times used	
7	http://www.oic.gov/SMALTZ/briefs/989fsupp17.htm
256	

Table 24: Top 20 URLs

Also, 114 out of 4231 results returned contained the word TREC (2,69%) for Systran. The same ratio was 21% for the original questions

Also, when looking at the Table 25, and comparing the results between the original and Systran's questions we can see that Systran did not translate the question word correctly. For example we have 47 "who" questions for the original questions and 108 for Systran's. So Systran "invented" another 61 "who" questions that where not there.

Question type	Determined by Systran	Original question type
Basic How	0	1
How+Adj	22	27
How+Much+ModMod	6	2
Name	3	4
Unidentified	15	0
What	6	65
When	19	20
Where	8	21
Which	4	10
Who	108	47
Why	2	2
Whom	0	1
	193	200

Table 25: Question Type of TREC-8 as Determined by Systran

These important mistakes led us to investigate this issue further. So we performed a question by question comparison to the question word, to find that Systran made a mistake in more than half the questions when translating the question word (see Table 25).

If we assume that Systran had translated the rest of the question correctly we would still be facing a great problem, since QA systems have patterns associated with each question type in order to try to find the answer.

Another fact that shows that experiment 2 did not perform acceptably for a Greek-English cross-language QA system is that only 0,2% of the rewrites and 9% of the questions returned a result when sent to Google quoted. The rest was sent unquoted in order to get results.

	SR	[illegible]	[illegible]	[illegible]
Cross-Lingual (Systran)	2,32%	6,42%	0%	0%
Monolingual	8,76%	38,36%	0,00%	3,00%

Table 26: Answers Found for Results

Also the fact that the questions from Systran where produced differently from the original ones caused only 256 rewrites to use the top 20 URLS (6,05%) compared to 20% of the original questions. This is because the original questions are used a lot on the web from TREC and other academic institutions.

In conclusion we could say that Systran also suffers in grammar and in "specialization". The syntax produced is very often wrong and words that have more than one meaning are translated into the first available in the lexicon instead of trying to conclude the correct one from the remainder of the sentence.

As shown in section 3.2, translation mechanisms (in particular Systran) in Greek-English seem to perform poorly for a number of reasons. The most important reasons include:

- The inefficiency of Systran for the Greek language, to translate a sentence correctly.
- The small number of words per translation (Question) which makes it difficult for translation mechanisms to define the domain.
- The number of different meanings that a word can have when translated from Greek to English and the inability of translation mechanisms to select the correct sense in the context.

For these reasons, a different strategy was tried as an alternative to full question translation for the passage retrieval component.

3.2.2.3 Future work

We do not believe that running the same test with TREC 9, 10, or 11 would give us further information on the efficiency of Systran and rewrites as a Greek-English cross language QA system tool since TREC-8 was enough to show that the experiment was insufficient for the job we have assigned it.

The next step from this experiment would be to try the same evaluation with another translation mechanism and compare it with the results of experiment 2.

Ideally we could use 2 or more translation mechanisms at the same time and merging their results, or taking their intersection.

3.2.3 Experiments 3 to 5 - Using Word for Word Translation

3.2.3.1 Experimental Setup

In experiment 3, we used a bilingual dictionary and sent every word of the question individually to the dictionary. We then used all possible translations of every word and created a Boolean expression that can be used in the search engine.

The dictionary selected was the online dictionary of www.in.gr found at http://www.in.gr/dictionary/lookup.asp. We chose this dictionary because it was easily available, of acceptable quality and because of the capability of providing synonyms of words if we wish to increase the recall.

Before sending all words of the manually translated Greek questions to the dictionary we had to do a number of tasks. First we had to tag all "Foreign Words", meaning words that after the manual translation in Greek, still remained in English, so we wouldn't have to send them for translation. After that we had to tag all Number and Date components of the question for the same reasons. We also had to remove the question word, since the dictionary was unable to provide a proper translation of question words. Due to the structural and grammatical differences between the two languages only a component specifically designed to translate the question word from English to Greek by using information from other words in the question would be able to perform such a task.

In order to perform these operations we used a Greek POS tagger developed by ILSP (www.ilsp.gr)[5] and we have tagged all TREC-8 questions that were manually translated in Greek. Then, a script took care of the operations performed before sending each word for translation.

Another script took every word of every question and it sent it to the dictionary and obtained one or more possible translations. After that, for every question, it built a Boolean expression.

Figure 5 shows an example of the query produced for question No 1. -Who is the author of the book: "The Iron Lady: A Biography of Margaret Thatcher?".

[5] The Greek POS tagger became available to us only after experiments 1 and 2 were completed. Having access to such a tool since the beginning would have changed our rewrite strategy for all experiments. (see section 3.1)

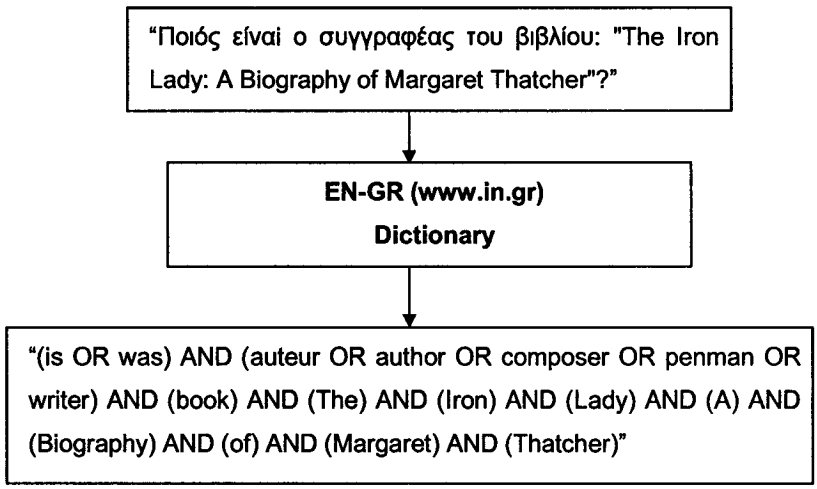

Figure 5: Example of Query Produced by Word for Word Translation for Question no 1

The Boolean expression is then sent to the appropriate search engine.

The search engines used were:

1. Google, since it was used in the previous tests for reasons explained previously and we needed the results for comparison.
2. AltaVista, since Google in this strategy was shown to have a serious disadvantage because it only accepts 10 keywords and most of the boolean expressions had twice this number of keywords. Google, thus, discarded half the keywords for many questions and thus performed poorly.

Another reason for using AltaVista was because we wanted to test a feature that only AltaVista offers, the NEAR operator. So we ran the test twice on AltaVista once using the AND and once using the NEAR operator. The NEAR operator

returns documents where the words connected with the NEAR operator appear in the document with no more than 10 words of distance.

With both search engines only the 20 first documents per Boolean expression were retrieved for evaluation.

The results of the tests are described in the following sections:

3.2.3.2 Results

Results with Google (Experiment 3)

By using this strategy we have obtained Boolean queries with an average length of 25.75 words / question. Hence, Google had a serious disadvantage in the strategy used. Since it has a 10 word limit in keywords and since for every word in a question there were different possible translations and synonyms, something that increased the number of keywords significantly, for many of the questions not all words of the question sentence were used.

The score was the following:

Total no of documents retrieved for all TREC-8 questions	3997
Total no of snippets retrieved for all TREC-8 questions	3997
No of document containing a correct answer	494 (12,35%)
No of snippets containing a correct answer	137 (3,4%)
No of questions for which a document had a correct answer	74 (37,00%)
No of questions for which a snippet had a correct answer	34 (17,00%)

Table 27: Results from Experiment 3

Results with AltaVista with the AND operator (Experiment 4)

AltaVista considered all keywords of the boolean query given and we have used the AND operator to connect the different question words, the results are the following:

Total no of document retrieved for all TREC-8 questions	4000
Total no of snippets retrieved for all TREC-8 questions	4000
No of documents containing a correct answer	968 (24,2%)
No of snippets containing a correct answer	40 (1,00%)
No of questions for which a document had a correct answer	121 (60,50%)
No of questions for which a snippet had a correct answer	8 (4,00%)

Table 28: Results from Experiment 4

Results with AltaVista with the NEAR operator (Experiment 5)

Next we have tried the same test by using the NEAR operator to connect the different question words. The results are the following:

Total no of document retrieved for all TREC-8 question	3980
Total no of snippets retrieved for all TREC-8 question	3980
No of document containing a correct answer	646 (16,23%)
No of Snippets containing a correct answer	40 (1,00%)
No of questions for which a document had a correct answer	98 (49,00%)
No of questions for which a snippet had a correct answer	11 (5,50%)

Table 29: Results from Experiment 5

3.2.4 Analysis

The problem in a Greek-English cross-lingual QA system, whether we use a translation mechanism (see section 3.2) or a dictionary (see section 3.2.3) is that the translation of the question word is most of the time wrong (Table 19: Question Type of TREC-8 as Determined by Systran) so we cannot identify the type of the question. Since dictionaries and translation mechanisms fail to

provide help in this field we would have to develop our own tool to identify the question type of Greek question words.

Experiment					
	MONO-LINGUAL	CROSS-LINGUAL			
	Experiment 1: Monolingual Rewrites and Google	Experiment 2: Cross-lingual rewrites, Systran and Google	Experiment 3: Cross-lingual rewrites, dictionary and Google	Experiment 4: Cross-lingual rewrites, dictionary and AltaVista using AND operator	Experiment 5: Cross-lingual rewrites, dictionary and AltaVista using NEAR operator
Documents containing a correct answer	38,36%	6,4%	12,35%	[illegible]	16,23%
Snippets containing a correct answer	8,76%	2,32%	[illegible]	1,00%	1,00%
Questions for which a correct answer was found in a document	91,09%	[illegible]	37,00%	60,50%	49,00%
Questions for which a correct answer was found in a snippet	61,25%	7,20%	[illegible]	4,00%	5,50%

Table 30: Comparison of Results from all 5 Experiments

As Table 30 shows, the word for word translation strategy scored overall better than the Systran translation strategy at the document level. This means that more documents contain the correct answer for a question. So generally a word for word translation strategy seems to work better for Greek-English cross-language question answering systems over a translation mechanism.

The best results with this strategy were held by AltaVista by using the AND operator for the documents and for the snippets the best results by Google (3,4%) by using the AND operator. (24,2%)

AltaVista's NEAR operator did not improve the results as expected.

The fact that Systran scored 61,76% for questions for which a correct answer was found in some document over 8,76% for documents containing correct answer indicates that when Systran makes a correct translation of the question, most of the documents returned for this question contain the correct answer. On the other hand, when Systran fails to make a correct translation, most of the documents returned from the search engine for this question do not contain the correct answer since the translation was grammatically incorrect .

The fact that AltaVista for the word for word translation strategy scored 60,56% for questions for which correct answers were found in some document over 24,20% for documents containing correct answer indicates that there was a better distribution of documents containing correct answers with respect to the questions.

The idea would be to have a system that would use the word for word translation strategy and use Google to retrieve snippets and AltaVista to retrieve documents. This would give optimal results.

4 Conclusion and Future Work

This thesis has opened many research avenues. First of all these experiments could have been performed by using a different search engine or different values of X (no of documents retrieved per question, X=20 in our tests).

We could also try to find which search engine performs better concerning the documents and the snippets and adopt a mixed search engine strategy.

Also, since by using the word for word translation strategy we obtained a better distribution of documents containing the correct answer per question, meaning more questions had documents that contained the correct answers, we could significantly increase the value of n (e.g. 50) and then on the retrieved documents we could run a different algorithm that would try to retrieve passages that contain a significant number of words of the translated question within a given distance.

Another interesting experiment would be to implement our own NEAR operator and run the experiment with different values of maximum distance between words for this operator (10 for AltaVista). Then we could find out what the optimum maximum distance for the NEAR operator is to use in such a system.

Furthermore since Systran performs better when the translation succeeds and worse when it fails we could use Systran for passage retrieval and check how it performed by measuring the number of documents returned containing a correct answer. If Systran performed poorly the system would use the word for word translation strategy with AltaVista and the AND operator, else the system would use Systran.

While new national federations and confederations appear and while supra-national entities like the European Union work towards their integration, because of the globalization, cross-language systems can and will also contribute socially and politically by distributing information cross-nationally and thus bringing nations and their people closer together.

We should continue to work hard in this field because there is much to be done, especially for less spoken languages where there is a lack of tools or the tools available aren't as efficient as we need.

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[redacted]

[redacted]

6 APPENDIX

Appendix A: Results from Google for Experiment 1

X=20 – Results by Question Type

Q TYPE	SNR	DOCR	SNR	DOCR	Nr of Questions
Basic How	10,00	25,00	0,00	10,00	20
How+Adj	9,64	26,12	0,00	0,64	467
How+Much+<Modifier>	0,00	7,41	0,00	0,00	27
Name	1,32	30,26	0,00	1,32	76
What	17,82	36,94	0,00	2,40	999
When	15,41	35,74	0,00	4,26	305
Where	20,11	55,17	0,00	4,31	348
Which	24,31	56,94	0,00	0,69	144
Who	23,73	40,53	0,00	4,93	750
Whom	5,88	23,53	0,00	0,00	17
Why	7,50	32,50	0,00	0,00	40

Q TYPE	SNR	DOCR	SNR	DOCR	Nr of Questions
Basic How	6,74	17,10	0,00	0,00	193
How+Adj	5,94	26,62	0,00	0,54	556
How+Much+<Modifier>	0,00	0,00	0,00	0,00	20
Name	14,70	43,80	0,00	4,03	347
Unidentified	11,96	34,97	0,00	0,00	326
What	14,66	37,95	0,00	2,49	4980
When	15,97	38,75	0,00	2,22	720
Where	14,43	46,41	0,00	3,96	1213
Which	11,54	30,77	0,00	0,00	52
Who	22,79	46,86	0,00	5,37	1733
Why	0,00	21,74	0,00	0,00	23

Q TYPE	SNR	DOCR	SNR	DOCR	Nr of Questions
Basic How	16,44	34,93	0,00	0,68	146
How+Adj	31,94	43,58	0,00	3,88	335
How+Much+<Modifier>	10,26	41,03	2,56	20,51	39
Name	7,89	23,68	2,63	5,26	38

TREC 10					
Q TYPE	SNP	DOP	SNR	DOPR	No of Questions
What	28,22	47,86	0,00	4,42	5857
When	30,67	53,57	0,00	5,04	476
Where	24,15	68,86	0,00	6,36	472
Which	35,00	58,75	0,00	1,25	80
Who	31,26	55,09	0,00	8,02	835
Why	4,69	28,13	0,00	1,56	64

TREC [illegible]					
Q TYPE	SNP	DOP	SNR	DOPR	No of Questions
Basic How	18,64	27,12	0,00	0,00	118
How+Adj	31,75	40,88	0,00	8,03	274
How+Much+<Modifier>	52,56	51,28	0,00	12,82	78
What	41,28	54,22	0,00	7,42	1267
When	21,45	45,41	0,00	6,07	676
Where	36,38	69,06	0,00	9,37	459
Which	29,63	37,04	0,00	0,00	27
Who	41,81	55,18	0,00	7,53	531

X=10 – Results by Question Type

TREC-8					
Q TYPE	SNR	DOC	SNR	DOC	Nr of questions
Basic How	0,00	30,00	0,00	10,00	10
How+Adj	9,63	28,15	0,00	0,37	270
How+Much+<Modifier>	0,00	10,00	0,00	0,00	20
Name	2,50	27,50	0,00	2,50	40
What	15,56	35,73	0,00	2,22	585
When	11,11	33,89	0,00	2,78	180
Where	18,14	57,84	0,00	4,90	204
Which	24,44	57,78	0,00	0,00	90
Who	20,43	39,14	0,00	4,09	465
Whom	10,00	10,00	0,00	0,00	10
Why	10,00	55,00	0,00	0,00	20

TREC-9					
Q TYPE	SNR	DOC	SNR	DOC	Nr of questions
Basic How	4,65	10,85	0,00	0,00	129
How+Adj	7,07	27,99	0,00	0,82	368
How+Much+<Modifier>	0,00	0,00	0,00	0,00	10
Name	15,66	46,97	0,00	4,55	198
Unidentified	14,29	38,42	0,00	0,00	203
What	14,49	38,55	0,00	2,28	3113
When	15,09	39,87	0,00	2,59	464
Where	12,82	47,75	0,00	2,39	710
Which	10,00	40,00	0,00	0,00	30
Who	22,57	47,43	0,00	4,86	1050
Why	0,00	25,00	0,00	0,00	20

TREC-10					
Q TYPE	SNR	DOC	SNR	DOC	Nr of questions
Basic How	16,67	41,11	0,00	1,11	90
How+Adj	28,27	39,79	0,00	2,62	191
How+Much+<Modifier>	15,00	45,00	5,00	25,00	20
Name	0,00	25,00	0,00	10,00	20
What	27,57	47,87	0,00	4,14	3355
When	29,02	56,08	0,00	2,35	255
Where	24,62	70,00	0,00	6,15	260
Which	32,84	56,72	0,00	1,49	67
Who	28,04	54,13	0,00	7,83	460
Why	7,50	30,00	0,00	2,50	40

TREC-1					
Q-TYPE	SN	DOB	SNR	[illegible]	[illegible]
Basic How	21,43	32,86	0,00	0,00	70
How+Adj	31,61	42,58	0,00	6,45	155
How+Much+<Modifier>	55,00	55,00	0,00	10,00	40
What	40,74	56,61	0,00	7,94	756
When	21,32	47,63	0,00	6,32	380
Where	39,09	71,19	0,00	8,64	243
Which	30,77	38,46	0,00	0,00	26
Who	36,68	55,36	0,00	9,00	289

Questions Answered by Question Type X=20

No of Questions for which at least one document contained a correct answer

Q TYPE	SNR	DOCR	SNR	DOCR	No of Questions
Basic How	100,00	100,00	0,00	100,00	1
How+Adj	48,15	81,48	0,00	11,11	27
How+Much+<Modifier>	0,00	100,00	0,00	0,00	2
Name	25,00	100,00	0,00	25,00	4
What	57,63	89,83	0,00	16,95	59
When	61,11	77,78	0,00	33,33	18
Where	71,43	100,00	0,00	28,57	21
Which	77,78	100,00	0,00	11,11	9
Who	68,09	95,74	0,00	29,79	47
Whom	100,00	100,00	0,00	0,00	1
Why	100,00	100,00	0,00	0,00	2

Q TYPE	SNR	DOCR	SNR	DOCR	No of Questions
Basic How	23,08	61,54	0,00	0,00	13
How+Adj	31,58	68,42	0,00	7,89	38
How+Much+<Modifier>	0,00	0,00	0,00	0,00	1
Name	50,00	95,00	0,00	25,00	20
Unidentified	85,71	90,48	0,00	0,00	21
What	59,68	85,71	0,00	15,56	315
When	57,45	80,85	0,00	17,02	47
Where	67,61	88,73	0,00	33,80	71
Which	100,00	100,00	0,00	0,00	3
Who	68,22	91,59	0,00	36,45	107
Why	0,00	50,00	0,00	0,00	2

Q TYPE	SNR	DOCR	SNR	DOCR	No of Questions
Basic How	44,44	77,78	0,00	11,11	9
How+Adj	45,00	75,00	0,00	15,00	20
How+Much+<Modifier>	50,00	50,00	50,00	50,00	2
Name	100,00	100,00	50,00	50,00	2
What	64,01	83,19	0,00	29,50	339
When	84,62	96,15	0,00	50,00	26
Where	76,92	100,00	0,00	53,85	26
Which	42,86	85,71	0,00	14,29	7

QuType	[illegible]	[illegible]	[illegible]	[illegible]	No. of questions
Who	69,57	91,30	0,00	43,48	46
Why	50,00	100,00	0,00	25,00	4

QuType	[illegible]	[illegible]	[illegible]	[illegible]	No. of questions
Basic How	50,00	50,00	0,00	0,00	8
How+Adj	50,00	72,22	0,00	38,89	18
How+Much+<Modifier>	75,00	75,00	0,00	50,00	4
What	79,27	85,37	0,00	43,90	82
When	57,50	87,50	0,00	37,50	40
Where	88,00	88,00	0,00	84,00	25
Which	50,00	50,00	0,00	0,00	4
Who	86,67	86,67	0,00	56,67	30

Questions Answered by Question Type X=10

No of Questions for which at least one document contained a correct answer

TREC-8					
Q TYPE	SNR	DOCR	SNR	DOCR	No of Questions
Basic How	0,00	100,00	0,00	100,00	1
How+Adj	48,15	81,48	0,00	3,70	27
How+Much+<Modifier>	0,00	100,00	0,00	0,00	2
Name	25,00	50,00	0,00	25,00	4
What	45,76	86,44	0,00	13,56	59
When	38,89	72,22	0,00	16,67	18
Where	61,90	95,24	0,00	28,57	21
Which	77,78	100,00	0,00	0,00	9
Who	61,70	91,49	0,00	23,40	47
Whom	100,00	100,00	0,00	0,00	1
Why	100,00	100,00	0,00	0,00	2

TREC-9					
Q TYPE	SNR	DOCR	SNR	DOCR	No of Questions
Basic How	15,38	53,85	0,00	0,00	13
How+Adj	28,95	68,42	0,00	7,89	38
How+Much+<Modifier>	0,00	0,00	0,00	0,00	1
Name	50,00	85,00	0,00	25,00	20
Unidentified	85,71	95,24	0,00	0,00	21
What	53,02	84,44	0,00	12,70	315
When	55,32	80,85	0,00	14,89	47
Where	54,93	88,73	0,00	18,31	71
Which	100,00	100,00	0,00	0,00	3
Who	59,81	83,18	0,00	25,23	107
Why	0,00	50,00	0,00	0,00	2

TREC-10					
Q TYPE	SNR	DOCR	SNR	DOCR	No of Questions
Basic How	44,44	77,78	0,00	11,11	9
How+Adj	40,00	75,00	0,00	10,00	20
How+Much+<Modifier>	50,00	50,00	50,00	50,00	2
Name	0,00	50,00	0,00	50,00	2
What	55,46	78,17	0,00	23,30	339
When	76,92	96,15	0,00	15,38	26
Where	69,23	96,15	0,00	38,46	26
Which	42,86	85,71	0,00	14,29	7

TREC-10					
Q TYPE	SN	DOC	SNR	DOCR	Number of Questions
Who	56,52	80,43	0,00	34,78	46
Why	50,00	75,00	0,00	25,00	4

TREC-11					
Q TYPE	SN	DOC	SNR	DOCR	Number of Questions
Basic How	50,00	62,50	0,00	0,00	8
How+Adj	44,44	72,22	0,00	33,33	18
How+Much+<Modifier>	75,00	75,00	0,00	50,00	4
What	73,17	84,15	0,00	35,37	82
When	57,50	85,00	0,00	30,00	40
Where	84,00	88,00	0,00	60,00	25
Which	50,00	50,00	0,00	0,00	4
Who	83,33	90,00	0,00	50,00	30

Appendix B: Questions used in Experiments

Original
1 Who is the author of the book, "The Iron Lady: A Biography of Margaret Thatcher"?
Greek Manual Translation
1; Ποιός είναι ο συγγραφέας του βιβλίου: "The Iron Lady: A Biography of Margaret Thatcher"?
Systran Translation
1; Who is the writer of book: "The Iron Lady: A Biography of Margaret Thatcher "?; 8;
Boolean Expression
1;(is OR was) NEAR (auteur OR author OR composer OR penman OR writer) NEAR (book) NEAR (The) NEAR (Iron) NEAR (Lady) NEAR (A) NEAR (Biography) NEAR (of) NEAR (Margaret) NEAR (Thatcher);20;

Original
2 What was the monetary value of the Nobel Peace Prize in 1989?
Greek Manual Translation
2; Ποία ήταν η αξία του βραβείου Nobel Ειρήνης το 1989?
Systran Translation
2; Who it was the value of reward Nobel of Peace in 1989? ; 8;
Boolean Expression
2;(is OR was) NEAR (account OR consequence OR currency OR merit OR object OR point OR security OR value OR virtue OR worth OR worthiness) NEAR (accolade OR award OR prix OR prize) NEAR (Nobel) NEAR (pax OR peace) NEAR
(1989);20;

Original
3 What does the Peugeot company manufacture?
Greek Manual Translation
3; Τι κατασκευάζει η εταιρεία Peugeot?
Systran Translation
3; What manufactures the company Peugeot? ; 8;
Boolean Expression
3;(build OR construct OR make OR manufacture OR mould) NEAR (Peugeot);20;

Original
4 How much did Mercury spend on advertising in 1993?
Greek Manual Translation

4; Πόσα ξόδεψε η Mercury σε διαφήμιση το 1993?
Systran Translation
4; How many xo'debe the Mercury in publicity in 1993? ; 8;
Boolean Expression
4; (consume OR expend OR go OR lay OR spend OR lash) NEAR (Mercury) NEAR (advertisement OR ink OR pitch OR plug OR promotion OR publicity) NEAR (1993);20;

Original
5 What is the name of the managing director of Apricot Computer?
Greek Manual Translation
5; Ποιό είναι το όνομα του γενικού διευθυντή της Apricot Computer?
Systran Translation
5; Who is the name of general director of Apricot Computer? ; 8;
Boolean Expression
5; (is OR was) NEAR (appellation OR celebrity OR denomination OR fame OR izar OR name OR noun OR renown OR report OR reputation OR stature OR title) NEAR (across OR blanket OR board OR broad OR collective OR common OR general OR generic OR global OR impersonal OR indiscriminate OR lax OR master OR overall OR sweeping OR universal OR widespread) NEAR (controller OR department OR director OR governor OR head OR manager) NEAR (Apricot) NEAR (Computer);20;

Original
6 Why did David Koresh ask the FBI for a word processor?
Greek Manual Translation
6; Γιατί ζήτησε ο David Koresh από το FBI έναν επεξεργαστή κειμένου?
Systran Translation
6; Why did ask the David Koresh from the FBI of processor of text? ; 8;
Boolean Expression
6; (ask OR beg OR demNEAR OR desire OR invite OR request OR require OR seek OR wish) NEAR (David) NEAR (Koresh) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (FBI) NEAR (each OR one OR person OR some OR somebody) NEAR (processor OR processor) NEAR (text OR writing);20;

Original
7 What debts did Qintex group leave?
Greek Manual Translation
7; Τι χρέη άφησε ο όμιλος Qintex?
Systran Translation
7; Which debts did leave the group Qintex? ; 8;
Boolean Expression
7; (commitment OR debt OR hock) NEAR (allow OR bequeath OR chuck OR commit OR desert OR drop OR forsake OR give OR go OR leave OR let OR

relinquish OR unhNEAR OR say) NEAR (association OR bNEAR OR club OR group OR outfit OR team OR cluster) NEAR (Qintex);20;

Original
8 What is the name of the rare neurological disease with symptoms such as: involuntary movements (tics), swearing, and
incoherent vocalizations (grunts, shouts, etc.)?
Greek Manual Translation
8; Ποιά είναι η ονομασία της νευρολογικής νόσου με συμπτώματα όπως: ακουσιες μετακινησεις (τικ), όρκιση και ασυνάρτητες φωνήσεις (γρυλίσματα, κραυγές, κ.λ.π....)?
Systran Translation
8; Who it is the name of neyrologjki's illness with symptoms as: involuntary locomotions (tjk), o'rkjsi and incoherent phonations (growlings, cries, k l p....)? ; 8;
Boolean Expression
8; (is OR was) NEAR (appellation OR denomination OR designation) NEAR (disease OR illness OR sickness) NEAR
(manifestation OR sign OR symptom) NEAR (as OR like OR to) NEAR (inadvertent OR involuntary) NEAR (displacement OR drift OR movement OR removal OR ride OR shift OR transfer OR translocation) NEAR (jerk OR tic) NEAR (NEAR OR et OR plus OR too OR with) NEAR (disconnected OR disjointed OR gibberish) NEAR (bawl OR call OR cry OR exclamation OR hoot OR howl OR scream OR shout OR tongue OR vociferation OR whoop OR yell);20;

Original
9 How far is Yaroslavl from Moscow?
Greek Manual Translation
9; Πόσο απέχει το Yaroslavl από την Μόσχα?
Systran Translation
9; How many abstains the Yaroslavl from the Moscow? ; 8;
Boolean Expression
9; (abstain OR cut OR eschew OR forbear OR forgo OR give) NEAR (Yaroslav) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (Moscow);20;

Original
10 Name the designer of the shoe that spawned millions of plastic imitations, known as "jellies".
Greek Manual Translation
10; Όνομάσε τον σχεδιαστή του παπουτσιού που λάνσαρε εκατομμύρια πλαστικών μιμήσεων, γνωστά ως "Jellies".
Systran Translation
10; It named the designer of shoe that la'nsare millions of plastic imitations, known as "Jellies". ; 8;
Boolean Expression

10; (clothier OR designer OR draughtsman OR drawer) NEAR (boot OR shoe) NEAR (where OR whereabouts) NEAR
(introduce OR set) NEAR (million) NEAR (plastic) NEAR (aping OR imitation OR mimesis) NEAR (acquaintance OR common OR familiar OR high OR known OR out) NEAR (Jellies);20;

Original
11 Who was President Cleveland's wife?
Greek Manual Translation
11; Ποιά ήταν η συζυγος του προεδρου Cleveland ?
Systran Translation
11; Who she was the spouse of chairman Cleveland? ; 8;
Boolean Expression
11; (is OR was) NEAR (consort OR hubby OR husbNEAR OR man OR spouse OR sultana OR wife OR woman) NEAR
(chairman OR president) NEAR (ClevelNEAR);20;

Original
12 How much did Manchester United spend on players in 1993?
Greek Manual Translation
12; Πόσα ξόδεψε η Manchester United σε παίχτες το 1993?
Systran Translation
12; How many xo'debe the Manchester United in players in 1993? ; 8;
Boolean Expression
12; (consume OR expend OR go OR lay OR spend OR lash) NEAR (Manchester) NEAR (United) NEAR (about OR after OR at OR for OR of OR on OR over OR to OR towards) NEAR (1993);20;

Original
13 How much could you rent a Volkswagen bug for in 1966?
Greek Manual Translation
13; Πόσο θα νοικιάζατε ένα Volkswagen σκαραβαίο το 1996?
Systran Translation
13; How many you would rent a Volkswagen skaravaj'o in 1996?; 8;
Boolean Expression
13; (hire OR lease OR rent) NEAR (each OR one OR person OR some OR somebody) NEAR (Volkswagen) NEAR (scarab) NEAR (1996);20;

Original
14 What country is the biggest producer of tungsten?
Greek Manual Translation
14; Ποιά χώρα είναι ο μεγαλύτερος παραγωγός βολφραμίου?
Systran Translation
14; Who country is the bigger producer of tungsten? ; 8;
Boolean Expression
14; (country OR INEAR OR nation OR power OR region) NEAR (is OR was)

NEAR (big OR good OR grNEAR OR great OR hearty OR large OR million) NEAR (derivative) NEAR ;20;

Original
15 When was London's Docklands Light Railway constructed?
Greek Manual Translation
15; Πότε κατασκευάστηκε το Docklands Light Railway του Λονδίνου?
Systran Translation
15; When was manufactured Docklands Light Railway of London? ; 8;
Boolean Expression
15; (build OR construct OR make OR manufacture OR mould) NEAR (DocklNEARs) NEAR (Light) NEAR (Railway) NEAR ;20;

Original
16 What two US biochemists won the Nobel Prize in medicine in 1992?
Greek Manual Translation
16; Ποίοι δύο αμερικάνοι βιοχημικοί κέρδισαν το βραβείο Nobel Ιατρικής το 1992?
Systran Translation
16; Who two American biochemists gained the reward Nobel of medicine in 1992? ; 8;
Boolean Expression
16; (twa OR twain OR two) NEAR (ethnic) NEAR (earn OR gain OR make OR notch OR profit OR win) NEAR (accolade OR award OR prix OR prize) NEAR (Nobel) NEAR (medical OR detail) NEAR (1992);20;

Original
17 How long did the Charles Manson murder trial last?
Greek Manual Translation
17; Πόσο καιρό κράτησε η δίκη για την δολοφονία του Charles Manson?
Systran Translation
17; How much time did keep the trial for the murder of Charles Manson? ; 8;
Boolean Expression
17; (hour OR tide OR time OR weather) NEAR (book OR deduct OR detain OR drag OR endure OR grip OR hang OR hold OR keep OR last OR retain OR stop OR sustain OR withstNEAR) NEAR (litigation OR trial) NEAR (about OR after OR at OR for OR of OR on OR over OR to OR towards) NEAR (assassination OR murder OR degree) NEAR (Charles) NEAR (Manson);20;

Original
18 Who was the first Taiwanese President?
Greek Manual Translation
18; Ποιός ήταν ο πρώτος πρόεδρος της Taiwan?
Systran Translation
18; Who was the first chairman of Taiwan? ; 8;
Boolean Expression

18; (is OR was) NEAR (first OR front OR original OR primary OR prior) NEA NEAR (Taiwan);20;

Original
19 Who was the leader of the Branch Davidian Cult confronted by the FBI in Waco, Texas in 1993?
Greek Manual Translation
19; Ποιός ήταν ο αρχηγός της οργάνωσης Davidian Cult που ήρθε αντιμέτωπος με το FBI στο Τέξας το 1993?
Systran Translation
19; Who was the head of parakladjoy' Davidian Cult that came confronted with the FBI in Texas in 1993? ; 8;
Boolean Expression
19; (is OR was) NEAR (captain OR chief OR commNEARer OR head OR master OR ringleader) NEAR (format OR ring OR set OR system) NEAR (Davidian) NEAR (Cult) NEAR (where OR whereabouts) NEAR (arrive OR come OR draw OR fall OR get) NEAR (FBI) NEAR (1993);20;

Original
20 Where is Inoco based?
Greek Manual Translation
20; Που βρίσκετε το Inoco?
Systran Translation
20; That you find the Inoco? ; 8;
Boolean Expression
20; (catch OR come OR discover OR fetch OR find OR get OR hit OR meet OR obtain OR raise OR run OR think) NEAR
(Inoco);20;

Original
21 Who was the first American in space?
Greek Manual Translation
21; Ποιός ήταν ο πρώτος Αμερικάνος στο διαστημα?
Systran Translation
21; Who was the first American in the interval? ; 8;
Boolean Expression
21; (is OR was) NEAR (first OR front OR original OR primary OR prior) NEAR (interspace OR interval OR run OR space OR span OR spread OR time);20;

Original
22 When did the Jurassic Period end?
Greek Manual Translation
22; Πότε τελείωσε η εποχή των δεινοσαύρων?
Systran Translation
22; When you finish the season of dinosaurs? ; 8;
Boolean Expression

22; (break OR cease OR clear OR close OR complete OR conclude OR do OR end OR finish OR get OR give OR go OR pass OR run OR sign OR terminate OR end OR smoke OR up) NEAR (age OR chapter OR date OR day OR epoch OR era OR hour OR period OR season OR tide OR time) NEAR ;20;

Original
23 When did Spain and Korea start ambassadorial relations?
Greek Manual Translation
23; Πότε άρχισαν η Ισπανία και η Κορέα πρεσβευτικές σχέσεις?
Systran Translation
23; When did begin Spain and Korea ambassadorial relations? ; 8;
Boolean Expression
23; (begin OR beginning OR commence OR enter OR fire OR go OR ground OR inchoate OR instigate OR institute OR mount OR proceed OR start OR strike) NEAR (NEAR OR et OR plus OR too OR with) NEAR (Korean) NEAR (diplomat OR diplomatic OR diplomatist) NEAR (affinity OR association OR bearing OR concern OR connection OR footing OR intercourse OR proportion OR reference OR regard OR relation OR relationship OR relevance OR causal);20;

Original
24 When did Nixon visit China?
Greek Manual Translation
24; Πότε επισκεύθηκέ ο Nixon την Κίνα?
Systran Translation
24; When epjskey'cike' the Nixon China? ; 8;
Boolean Expression
24; (Nixon) NEAR (China);20;

Original
25 Who was the lead actress in the movie "Sleepless in Seattle"?
Greek Manual Translation
25; Ποιά ήταν η πρωταγωνίστρια στην ταινία "Sleepless in Seattle"?
Systran Translation
25; Who she was the protagonist in the film "Sleepless in Seattle"? ; 8;
Boolean Expression
25; (is OR was) NEAR (heroine) NEAR (bNEAR OR cinefilm OR cingulum OR commissure OR fillet OR picture OR ribNEAR OR ribbon OR sash OR streak OR tape OR tapeworm) NEAR (Sleepless) NEAR (in) NEAR (Seattle);20;

Original
26 What is the name of the "female" counterpart to El Nino, which results in cooling temperatures and very dry weather?
Greek Manual Translation
26; Ποιό είναι το όνομα του "θυληκού" Ελ Νίνιο, που οδηγεί σε πτώση θερμοκρασιών και πολύ ξηρό καιρό?
Systran Translation

26; Who is the name "cylykoy' " El Nj'njo, that leads to fall of temperatures and very dry time? ; 8;
Boolean Expression
26; (is OR was) NEAR (appellation OR celebrity OR denomination OR fame OR izar OR name OR noun OR renown OR report
OR reputation OR stature OR title) NEAR (where OR whereabouts) NEAR (bring OR conduct OR drive OR get OR guide OR lead OR manoeuvre OR march OR steer OR take) NEAR (backfall OR case OR collapse OR declension OR decline OR downfall OR drop OR ebb OR fall OR flyer OR INEARing OR lapse OR overthrow OR slide OR tumble) NEAR (heat OR
temperature OR vitals OR warmth OR blood) NEAR (NEAR OR et OR plus OR too OR with) NEAR (amain OR awfully OR bad

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Original
27 Where did the 6th annual meeting of Indonesia-Malaysia forest experts take place?
Greek Manual Translation
27; Που έλαβε χώρα η 6η ετήσια συνεδριαση Ινδονήσιων-Μαλαισιανών δασικών εμπειρογνωμόνων?
Systran Translation
27; That did take place the 6th annual meeting Indonesias of - Malaysian forestal experts?; 8;
Boolean Expression
27; (get OR have OR obtain OR read OR receive OR take) NEAR (country OR INEAR OR nation OR power OR region) NEAR (6th) NEAR (annual OR etesian OR year OR yearly) NEAR (conference OR congress OR convention OR symposium) NEAR (forestal OR silvan OR warden) NEAR ;20;

Original
28 Who may be best known for breaking the color line in baseball?
Greek Manual Translation
28; Ποιός μπορεί να είναι πιο γνωστός για το σπάσιμο της color line στο baseball?
Systran Translation
28; Who can be more acquaintance for the fracture color line in baseball? ; 8;
Boolean Expression
28; (is OR was) NEAR (more) NEAR (acquaintance OR common OR familiar OR high OR known OR out) NEAR (about OR after OR at OR for OR of OR on OR over OR to OR towards) NEAR (break OR breakage OR chip OR crash) NEAR (color) NEAR (line) NEAR (baseball);20;

Original
29 What is the brightest star visible from Earth?
Greek Manual Translation
29; Ποιό είναι το φωτεινότερο αστέρι ορατό από την γή?
Systran Translation

29; Who is the fwtejno'tero star visible from the ground? ; 8;
Boolean Expression
29; (is OR was) NEAR (bright OR brilliant OR illuminant OR luminous OR radiant) NEAR (star OR asterias) NEAR (discernible OR observable OR ocular OR view OR visible) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR ;20;

Original
30 What are the Valdez Principles?
Greek Manual Translation
30; Ποιές είναι οι αρχές Valdez?
Systran Translation
30; Who are the beginnings Valdez? ; 8;
Boolean Expression
30; (is OR was) NEAR (authority OR beginning OR break OR commencement OR creed OR estate OR inception OR inchoation OR initiation OR maxim OR offset OR opening OR origination OR outset OR postulate OR power OR precept OR principle OR rule OR set OR stNEARard OR start) NEAR (Valdez);20;

Original
31 Where was Ulysses S. Grant born?
Greek Manual Translation
31; Που γεννήθηκε ο Ulysses S. Grant?
Systran Translation
31; That was given birth the Ulysses P. Grant? ; 8;
Boolean Expression
31; (Ulysses) NEAR (Grant);20;

Original
32 Who received the Will Rogers Award in 1989?
Greek Manual Translation
32; Ποιός έλαβε το βραβείο Will Rogers το 1989?
Systran Translation
32; Who received the reward Will Rogers in 1989? ; 8;
Boolean Expression
32; (get OR have OR obtain OR read OR receive OR take) NEAR (accolade OR award OR prix OR prize) NEAR (Will) NEAR (Rogers) NEAR (1989);20;

Original
33 What is the largest city in Germany?
Greek Manual Translation
33; Ποιά είανι η μεγαλύτερη πόλη στην Γερμανία?
Systran Translation
33; Who ej'anj the bigger city in Germany? ; 8;
Boolean Expression

33; (is OR was) NEAR (big OR good OR grNEAR OR great OR hearty OR large OR million) NEAR (city OR town) NEAR
(Germania);20;

Original
34 Where is the actress, Marion Davies, buried?
Greek Manual Translation
34; Που είναι θαμμένη η ηθοποιός Marion Davies?
Systran Translation
34; That is camme'ni the actor Marion Davies? ; 8;
Boolean Expression
34; (is OR was) NEAR (actor OR performer OR player) NEAR (Marion) NEAR (Davies);20;

Original
35 What is the name of the highest mountain in Africa?
Greek Manual Translation
35; Ποιό είναι το όνομα του ψηλότερου βουνού στην Αφρική?
Systran Translation
35; Who is the name of taller mountain in Africa? ; 8;
Boolean Expression
35; (is OR was) NEAR (appellation OR celebrity OR denomination OR fame OR izar OR name OR noun OR renown OR report OR reputation OR stature OR title) NEAR (high) NEAR (alp OR berg OR mound OR mount OR mountain) NEAR (Africa);20;

Original
36 In 1990, what day of the week did Christmas fall on?
Greek Manual Translation
36; Το 1990, ποιά μέρα τη εβδομάδας έπεσαν τα Χριστούγεννα?
Systran Translation
36; In 1990, who day of week did fall the Christmas? ; 8;
Boolean Expression
36;(1990) NEAR (feel OR whichever) NEAR (day OR by) NEAR (sennight OR week OR chaste) NEAR (descend OR sink)
NEAR (Christmas);20;

Original
37 What was the name of the US helicopter pilot shot down over North Korea?
Greek Manual Translation
37; Ποιό ήταν το όνομα το αμερικάνου πιλότου ελικοπτέρου που καταρίφθηκε πάνω από την Βόρεια Κορέα?
Systran Translation
37; Who was the name of American pilot of helicopter that katarj'fcike above the North Korea? ; 8;
Boolean Expression

37; (is OR was) NEAR (appellation OR celebrity OR denomination OR fame OR izar OR name OR noun OR renown OR report OR reputation OR stature OR title) NEAR (airman OR fish OR flier OR pilot) NEAR (chopper OR helicopter OR hoverplane) NEAR (where OR whereabouts) NEAR (bring OR confute OR down OR explode OR shoot OR vitiate) NEAR (aboard OR atop OR on OR over OR upon) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (boreal) NEAR (Korean);20;

Original
38 Where was George Washington born?
Greek Manual Translation
38; Που γεννήθηκε ο George Washington?
Systran Translation
38; That was given birth the George Washington? ; 8;
Boolean Expression
38; (George) NEAR (Washington);20;

Original
39 Who was chosen to be the first black chairman of the military Joint Chiefs of Staff?
Greek Manual Translation
39; Ποιός επιλέχθηκε ως πρώτος μαύρος πρόεδρος των κοινών αρχηγών προσωπικού στρατού?
Systran Translation
39; Who was selected as first black chairman of common heads of personal army? ; 8;
Boolean Expression
39; (black OR bold OR sable) NEAR (chairman OR president) NEAR (collective OR common OR communal OR conjunct OR everyday OR garden OR household OR joint OR mutual OR nondescript OR ordinary OR private OR quotidian OR
unexceptional OR united OR unremarkable OR usual OR vulgar) NEAR (captain OR chief OR commNEARer OR head OR
master OR ringleader) NEAR (establishment OR personnel OR staff) NEAR (army OR army) NEAR (adopt OR choose OR
decide OR designate OR fix OR follow OR opt OR pick OR prefer OR select OR take) NEAR (first OR front OR original OR

Original
40 Who won the Nobel Peace Prize in 1991?
Greek Manual Translation
40; Ποιός κέρδισε το Nobel ειρήνης το 1991?
Systran Translation
40; Who gained the Nobel of peace in 1991? ; 8;
Boolean Expression

40; (earn OR gain OR make OR notch OR profit OR win) NEAR (Nobel) NEAR (pax OR peace) NEAR (1991);20;

Original
41 What is the legal blood alcohol limit for the state of California?
Greek Manual Translation
41; Ποιό είναι το νόμιμο όριο οινοπνεύματος στο αίμα στην πολιτεία της Kalifornia?
Systran Translation
41; Who is the legal limit of alcohol in the blood in the state her Kalifornia? ; 8;
Boolean Expression
41; (is OR was) NEAR (due OR kosh OR lawful OR legal OR legitimate OR licit OR official) NEAR (border OR bound OR
boundary OR edge OR end OR extent OR finitude OR horizon OR limit OR line OR margin OR mete OR pale OR parameter OR stint OR tether OR verge OR endurance) NEAR (alcohol OR ethanol) NEAR (blood OR flesh OR gore) NEAR (body OR city OR crown OR deportment OR government OR polity OR republic OR state) NEAR (California);20;

Original
42 What was the target rate for M3 growth in 1992?
Greek Manual Translation
42; Ποιός ήταν ο στόχος ρυθμού ανάπτυξης για την M3 το 1992?
Systran Translation
42; Who was the objective of rythm of growth for the M3 in 1992? ; 8;
Boolean Expression
42; (is OR was) NEAR (aim OR cock OR end OR mark OR purpose OR target) NEAR (beat OR order OR rate OR rhythm OR style OR tempo OR time) NEAR (boom OR development OR elaboration OR evolution OR formation OR growth) NEAR (about OR after OR at OR for OR of OR on OR over OR to OR towards) NEAR (M3) NEAR (1992);20;

Original
43 What costume designer decided that Michael Jackson should only wear one glove?
Greek Manual Translation
43; Ποιός σχεδιαστής ρούχων αποφάσισε ότι ο Micheal Jackson θα έπρεπε να φορέσει μόνο ένα γάντι?
Systran Translation
43; Who designer of clothes decided that the Micheal Jackson would be supposed to wear only a glove? ; 8;
Boolean Expression
43; (clothier OR designer OR draughtsman OR drawer) NEAR (dress OR garment) NEAR (decide OR decision OR determine OR make OR mind OR resolve OR settle) NEAR (ought OR what) NEAR (Micheal) NEAR (Jackson)

NEAR (must OR should OR infer) NEAR (alone OR just OR only) NEAR (each OR one OR person OR some OR somebody) NEAR (glove);20;

Original
44 Who is the director of the international group called the Human Genome Organization (HUGO) that is trying to coordinate
gene-mapping research worldwide?
Greek Manual Translation
44; Ποιός είναι ο διευθυντής της
Systran Translation
44; Who is her director ; 8;
Boolean Expression
44; (is OR was) NEAR (controller OR department OR director OR governor OR head OR manager) NEAR (cosmopolitan OR international) NEAR (bNEAR OR bracket OR cell OR field OR flock OR gang OR group OR outfit OR side OR team) NEAR (where OR whereabouts) NEAR (call OR denominate) NEAR (Human) NEAR (Genome) NEAR (Organization) NEAR (HUGO) NEAR (where OR whereabouts) NEAR (begin OR strive) NEAR (assimilate OR attune OR gear OR syntonize OR syntonise OR tune) NEAR (check OR disquisition OR exploration OR inquiry OR investigation OR perquisition OR probe OR research OR

Original
45 When did Lucelly Garcia, a former ambassador of Columbia to Honduras, die?
Greek Manual Translation
45; Πότε πέθανε η Lucelly Garcia, πρώην πρέσβης της Κολομβίας στην Ονδούρα?
Systran Translation
45; When did die the Lucelly Garcia, former ambassador of Colombia in Honduras? ; 8;
Boolean Expression
45; (away OR bucket OR conk OR croak OR cross OR debt OR depart OR die OR expire OR go OR life OR majority OR nature OR no OR pass OR peg OR snuff) NEAR (Lucelly NEAR (Garcia) NEAR (erstwhile OR ex OR former OR late OR once OR one OR past OR quondam OR sometime) NEAR (Columbian) NEAR ;20;

Original
46 Who is the mayor of Marbella?
Greek Manual Translation
46; Ποιός είναι ο δημαρχος της Marbella?
Systran Translation
46; Who is the mayor of Marbella? ; 8;
Boolean Expression
46; (is OR was) NEAR (mayor) NEAR (Marbella);20;

Original
47 What company is the largest Japanese ship builder?
Greek Manual Translation
47; Ποιά εταιρεία είναι ο μεγαλύτερος κατασκευαστής πλοίων στην Ιαπωνία?
Systran Translation
47; Who company is the bigger constructor of boats in Japan? ; 8;
Boolean Expression
47; (is OR was) NEAR (big OR good OR grNEAR OR great OR hearty OR large OR million) NEAR (builder OR constructor OR cutler OR maker) NEAR (ship OR vessel) NEAR (Japan OR JaplNEAR);20;

Original
48 Where is the massive North Korean nuclear complex located?
Greek Manual Translation
48; Που βρίσκεται το ογκόδες Βόρειο-Κορεάτικο πυρηνικό συγκρότημα?
Systran Translation
48; That is found the ogko'des Notherner - Korea'tjko nuclear group? ; 8;
Boolean Expression
48; (catch OR come OR discover OR fetch OR find OR get OR hit OR meet OR obtain OR raise OR run OR think) NEAR (big OR good OR grNEAR OR great OR hearty OR large OR million) NEAR (nuclear OR nuclear) NEAR (block OR cluster OR complex OR conglomerate OR conglomeration OR ensemble OR estate OR facility OR group OR pool OR set OR troupe OR unit);20;

Original
49 Who fired Maria Ybarra from her position in San Diego council?
Greek Manual Translation
49; Ποίος απόλυσε την Maria Ybarra από την θέση της στο συμβούλιο του San Diego?
Systran Translation
49; Who you release the Maria Ybarra from her place in his council As Diego? ; 8;
Boolean Expression
49; (discharge OR dismiss OR elbow OR fire OR lay OR let OR retire OR sack) NEAR (Maria) NEAR (Ybarra) NEAR
(beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR
inadvertence) NEAR (appointment OR class OR fleche OR job OR locality OR location OR locus OR office OR place OR point OR position OR post OR posture OR proposition OR seat OR site OR situation OR slant OR spot OR stance OR stNEAR OR station OR status OR thesis OR view) NEAR (my) NEAR (board OR council) NEAR (San) NEAR (Diego);20;

Original
50 When was Dubai's first concrete house built?

Greek Manual Translation
50; Πότε χτίστηκε το πρώτο χτιστό σπίτι στο Dubai?
Systran Translation
50; When htj'stike the first htjsto' house in the Dubai? ; 8;
Boolean Expression
50; (build OR construct OR erect) NEAR (first OR front OR original OR primary OR prior) NEAR (family OR home OR house OR place OR house) NEAR (Dubai);20;

Original
51 Who is the president of Stanford University?
Greek Manual Translation
51; Ποιός είναι ο πρόεδρος του πανεπιστιμίου το Stanford?
Systran Translation
51; Who is the chairman panepjstjmj'oy the Stanford? ; 8;
Boolean Expression
51; (is OR was) NEAR (chairman OR president) NEAR (Stanford);20;

Original
52 Who invented the road traffic cone?
Greek Manual Translation
52; Ποιός εφηύρε τον κώνο οδικής κυκλοφορίας?
Systran Translation
52; Who invented the cone of road circulation? ; 8;
Boolean Expression
52; (coin OR dream OR invent OR make) NEAR (bell OR cone OR spire) NEAR (vehicular) NEAR (circulation OR emission OR release OR traffic);20;

Original
53 Who was the first doctor to successfully transplant a liver?
Greek Manual Translation
53; Ποιός ήταν ο πρώτος γιατρός που μεταμόσχευσε συκώτι με επιτυχία?
Systran Translation
53; Who was the first doctor that metamo'sheyse liver with success? ; 8;
Boolean Expression
53; (is OR was) NEAR (first OR front OR original OR primary OR prior) NEAR (bolus OR doc OR doctor OR physician OR
doctor) NEAR (where OR whereabouts) NEAR (engraft OR graft) NEAR (liver) NEAR (go OR hit OR success);20;

Original
54 When did Nixon die?
Greek Manual Translation
54; Πότε πέθανε ο Nixon?
Systran Translation
54; When did die the Nixon? ; 8;

Boolean Expression
54; (away OR bucket OR conk OR croak OR cross OR debt OR depart OR die OR expire OR go OR life OR majority OR nature OR no OR pass OR peg OR snuff) NEAR (Nixon);20;

Original
55 Where is Microsoft's corporate headquarters located?
Greek Manual Translation
55; Που βρίσκετε η έδρα της εταιρείας Microsoft?
Systran Translation
55; That you find the seat of company Microsoft? ; 8;
Boolean Expression
55; (catch OR come OR discover OR fetch OR find OR get OR hit OR meet OR obtain OR raise OR run OR think) NEAR (anus OR central OR chair OR court OR domicile OR head OR headquarters OR main OR seat) NEAR (Microsoft);20;

Original
56 How many calories are there in a Big Mac?
Greek Manual Translation
56; Πόσες θερμίδες υπάρχουν σε ένα Big Mac?
Systran Translation
56; How much calories exist in a Big Mac? ; 8;
Boolean Expression
56; (calorie OR therm) NEAR (be OR exist OR occur) NEAR (each OR one OR person OR some OR somebody) NEAR (Big) NEAR (Mac);20;

Original
57 What is the acronym for the rating system for air conditioner efficiency?
Greek Manual Translation
57; Ποιό είναι το αρτικόλεξο για το σύστημα βαθμολογίας αποδοτικότητας των κλιματιστικών?
Systran Translation
57; Who is the artjko'lexo for system of grades of efficiency of airconditioners? ; 8;
Boolean Expression
57; (is OR was) NEAR (about OR after OR at OR for OR of OR on OR over OR to OR towards) NEAR (apparatus OR
assembly OR contrivance OR edifice OR gear OR grid OR method OR practice OR system) NEAR (achievement OR mark) NEAR (efficiency) NEAR ;20;

Original
58 Name a film that has won the Golden Bear in the Berlin Film Festival.
Greek Manual Translation
58; Ονομάστε μια ταινία που έχει κερδίσει τη χρυσή αρκούδα στο φεστιβάλ ταινιών του Βερολίνου.
Systran Translation

58; Name a film that has gained the golden bear in the festival of films of Berlin. ; 8;
Boolean Expression
58; (each OR one OR person OR some OR somebody) NEAR (bNEAR OR cinefilm OR cingulum OR commissure OR fillet OR picture OR ribNEAR OR ribbon OR sash OR streak OR tape OR tapeworm) NEAR (where OR whereabouts) NEAR (have OR hold OR incorporate OR own OR possess OR read OR wear) NEAR (earn OR gain OR make OR notch OR profit OR win) NEAR (aurum OR gold OR golden OR or OR yellow) NEAR (bear) NEAR (festival) NEAR (bNEAR OR cinefilm OR cingulum OR commissure OR fillet OR picture OR ribNEAR OR ribbon OR sash OR streak OR tape OR tapeworm) NEAR ;20;

Original
59 Who was President of Costa Rica in 1994?
Greek Manual Translation
59; Ποιός ήταν ο πρόεδρος της Κόστα Ρίκα το 1994?
Systran Translation
59; Who was the chairman of Costa Rica in 1994? ; 8;
Boolean Expression
59; (is OR was) NEAR (chairman OR president) NEAR (1994);20;

Original
60 What is the fare cost for the round trip between New York and London on Concorde?
Greek Manual Translation
60; Πόσο κοστίζουν τα ναύλα από την Νέα Υόρκη στο Λονδίνο με επιστροφή με το Concorde?
Systran Translation
60; How many they cost nay'la from the New York in London with return with the Concorde? ; 8;
Boolean Expression
60; (be OR cost OR set) NEAR (freight OR freightage OR waterage) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (fresh OR little OR new OR young) NEAR (come OR refund OR return OR reversion) NEAR (Concorde);20;

Original
61 What brand of white rum is still made in Cuba?
Greek Manual Translation
61; Ποιά μάρκα λευκού ρουμιού γίνεται ακόμα στην Κούβα?
Systran Translation
61; Who make of white rum does become still in Cuba? ; 8;
Boolean Expression
61; (mark) NEAR (blank OR clean OR fair) NEAR (be OR become OR come OR

draw OR get OR go OR grow OR make OR meld OR turn) NEAR (any OR anymore OR even OR further OR still OR yet) NEAR (bucket OR bucketful OR pail OR pailful);20;

Original
62 What is the name of the chronic neurological autoimmune disease which attacks the protein sheath that surrounds nerve cells causing a gradual loss of movement in the body?
Greek Manual Translation
62; Ποιο είναι το όνομα της χρόνιας νευρολογικής νόσου που επιτίθεται στην πρωτεϊνική θήκη που περιβάλλει τα στοιχεία
νεύρων προκαλώντας μια βαθμιαία απώλεια μετακίνησης στο σώμα
Systran Translation
62; Who is the name of chronic neyrologjki's illness that attacks in the prwtej!njki' sheath that surrounds the elements neuron causing a gradual loss of locomotion in the body ; 8;
Boolean Expression
62; (is OR was) NEAR (appellation OR celebrity OR denomination OR fame OR izar OR name OR noun OR renown OR report OR reputation OR stature OR title) NEAR (besetting OR chronic OR confirmed OR constant OR perennial OR pertinacious) NEAR (disease OR illness OR sickness) NEAR (where OR whereabouts) NEAR (append OR apply OR superimpose OR superpose) NEAR (case OR encasement OR sheath OR slip OR theca) NEAR (where OR whereabouts) NEAR (array OR beset OR bound OR cloak OR close OR clothe OR drape OR embay OR embosom OR encase OR encircle OR encompass OR

Original
63 What nuclear-powered Russian submarine sank in the Norwegian Sea on April 7, 1989?
Greek Manual Translation
63; Ποίο Ρωσικό πυρινοκίνητο υποβρύχιο βυθίστικε στην θάλλασα της Νορβιγιάς στις 7 Απριλίου του 1989?
Systran Translation
63; Who Russian pyrjnokj'nito submarine vycj'stjke in ca'llasa the Norvjgja's on 7 April 1989? ; 8;
Boolean Expression
63; (Russian) NEAR (submarine) NEAR (dib OR dig OR dip OR dunk OR immerse OR plunge OR shipwreck OR sink OR steep OR submerge) NEAR (blue OR brine OR briny OR drink OR sea) NEAR ;20;

Original
64 Who is the voice of Miss Piggy?
Greek Manual Translation
64; Ποιά είναι η φωνή της Miss Piggy?
Systran Translation
64; Who it is the voice of Miss Piggy? ; 8;

Boolean Expression
64; (is OR was) NEAR (call OR voice OR voice) NEAR (Miss) NEAR (Piggy);20;

Original
65 Name a country that is developing a magnetic levitation railway system.
Greek Manual Translation
65; Ονομάστε μια χώρα που αναπτύσσει ένα σιδηροδρομικό σύστημα μαγνητικής ανύψωσης.
Systran Translation
65; Name a country that develops a railway system of magnetic elevation. ; 8;
Boolean Expression
65; (each OR one OR person OR some OR somebody) NEAR (country OR INEAR OR nation OR power OR region) NEAR
(where OR whereabouts) NEAR (array OR build OR deploy OR develop OR dilate OR discourse OR enunciate OR expNEAR OR flesh OR propound OR put OR sprout OR state OR unfold OR work OR enlarge OR explicate) NEAR (railway) NEAR (apparatus OR assembly OR contrivance OR edifice OR gear OR grid OR method OR practice OR system) NEAR (magnetic) NEAR (elevation OR hoist OR lift);20;

Original
66 Name the first private citizen to fly in space.
Greek Manual Translation
66; Ονομάστε τον πρώτο ίδιώτη πολίτη που πέταξε στο διάστημα.
Systran Translation
66; Name the first private individual of citizen that flew in the interval. ; 8;
Boolean Expression
66; (first OR front OR original OR primary OR prior) NEAR (citizen OR civilian OR commoner OR idiot OR individual OR private) NEAR (citizen OR civilian OR commoner) NEAR (where OR whereabouts) NEAR (drop) NEAR (interspace OR interval OR run OR space OR span OR spread OR time);20;

Original
67 What is the longest river in the United States?
Greek Manual Translation
67; Ποιός είναι ο μακρύτερος ποταμός στις Ηνωμένες Πολιτείες?
Systran Translation
67; Who is the longer river in the United States? ; 8;
Boolean Expression
67; (is OR was) NEAR (lengthy OR long) NEAR (river) NEAR (body OR city OR crown OR deportment OR government OR polity OR republic OR state);20;

Original
68 What does El Nino mean in spanish?
Greek Manual Translation
68; Τι σημαίνει El Ninio στα Ισπανικά?

Systran Translation
68; What means El Ninio in the Spanish? ; 8;
Boolean Expression
68; (chime OR denote OR go OR import OR mean OR ring OR signify OR sound OR speak OR strike) NEAR (El) NEAR (Ninio) NEAR ;20;

Original
69 Who came up with the name, El Nino?
Greek Manual Translation
69; Ποιός σκέφτηκε το όνομα El Ninio?
Systran Translation
69; Who thought the name El Ninio? ; 8;
Boolean Expression
69; (appellation OR celebrity OR denomination OR fame OR izar OR name OR noun OR renown OR report OR reputation OR stature OR title) NEAR (El) NEAR (Ninio);20;

Original
70 How many lives were lost in the China Airlines' crash in Nagoya, Japan?
Greek Manual Translation
70; Πόσες ζωές χάθηκαν στη συντριβή των αερογραμμών της Κίνας στο Νάγκουα της Ιαπωνίας?
Systran Translation
70; How much lives were lost in the crash of airlines of China in the Nagoya of Japan? ; 8;
Boolean Expression
70; (animation OR being OR bios OR life OR lifetime OR living OR wear OR ale) NEAR (blow OR bury OR lose OR mislay OR misplace OR miss OR waste) NEAR (breakdown OR comminution OR contrition OR crash OR distress OR smash) NEAR (air OR airline) NEAR (China) NEAR (Japan OR JaplNEAR);20;

Original
71 In what year did Joe DiMaggio compile his 56-game hitting streak?
Greek Manual Translation
71; Ποιά χρονία ολοκλήρωσε ο Joe DiMaggio το 56ο παιχνίδι του με hitting Streak?
Systran Translation
71; Who years did complete the Joe DiMaggio his 56th game with hitting Streak? ; 8;
Boolean Expression
71; (year) NEAR (accomplish OR button OR close OR complement OR complete OR conclude OR consummate OR do OR finish OR get OR make OR round OR sew OR wrap) NEAR (Joe) NEAR (DiMaggio) NEAR (56th) NEAR (game OR play OR toy) NEAR (my) NEAR (hitting) NEAR (Streak);20;

Original
72 When did the original Howdy Doody show go off the air?
Greek Manual Translation
72; Πότε σταμάτησε η αυθεντική εκπομπή Howdy Doody?
Systran Translation
72; When did stop the authentic emission Howdy Doody? ; 8;
Boolean Expression
72; (authentic OR canonical OR genuine OR kosh OR legitimate OR official OR original OR real OR true) NEAR (broadcast OR broadcasting OR emanation OR emission OR programme OR send OR transmission) NEAR (Howdy) NEAR (Doody);20;

Original
73 Where is the Taj Mahal?
Greek Manual Translation
73; Πού είναι το Taj Mahal?
Systran Translation
73; Where is the Taj Mahal? ; 8;
Boolean Expression
73; (is OR was) NEAR (Taj)NEAR (Mahal);20;

Original
74 Who leads the star ship Enterprise in Star Trek?
Greek Manual Translation
74; Ποιός ηγείτε του αστρόπλοιου Enterprise στο Star Trek?
Systran Translation
74; Who of igej'te astro'plojoy Enterprise in the Star Trek? ; 8;
Boolean Expression
74; (captain OR head OR lead OR spearhead) NEAR (Enterprise) NEAR (Star) NEAR (Trek);20;

Original
75 What cancer is commonly associated with AIDS?
Greek Manual Translation
75; Ποιος καρκίνος συνδέεται συνήθως με το AIDS?
Systran Translation
75; Who cancer is usually connected with the AIDS? ; 8;
Boolean Expression
75; (Cancer OR cancer OR crab) NEAR (associate OR bind OR colligate OR conjoin OR connect OR couple OR hitch OR join) NEAR (commonly OR customarily OR habitually OR usually) NEAR (AIDS);20;

Original
76 In which year was New Zealand excluded from the ANZUS alliance?
Greek Manual Translation
76; Ποιά χρονιά αποκλείστηκε η Νέα Ζηλανδία από τη συμμαχία ANZUS?

Systran Translation
76; Who year was excluded the New Zealand from alliance ANZUS? ; 8;
Boolean Expression
76; (year) NEAR (bar OR debar OR eliminate OR exclude OR knock OR preclude OR rule) NEAR (fresh OR little OR new OR young) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (alliance OR coalition OR confederacy OR league) NEAR (ANZUS);20;

Original
77 Who played the part of the Godfather in the movie, "The Godfather"?
Greek Manual Translation
77; Ποιος έπαιξε το ρόλο του νονού στη ταινία, "ο Νονός"?
Systran Translation
77; Who played the role of godfather in the film, "the Godfather "? ; 8;
Boolean Expression
77; (dally OR enact OR fidget OR game OR gybe OR jiggle OR joggle OR monkey OR oscillate OR perform OR pipe OR play OR shoot OR sport OR toy OR trifle OR wriggle) NEAR (part OR role) NEAR (christener OR godfather OR racketeer) NEAR
(bNEAR OR cinefilm OR cingulum OR commissure OR fillet OR picture OR ribNEAR OR ribbon OR sash OR streak OR tape OR tapeworm) NEAR (christener OR godfather OR racketeer);20;

Original
78 Which large U.S. city had the highest murder rate for 1988?
Greek Manual Translation
78; Ποια μεγάλη ΑΜΕΡΙΚΑΝΙΚΉ πόλη είχε το υψηλότερο ποσοστό δολοφονίων το 1988?
Systran Translation
78; Who big AMERICAN city had the higher percentage of murders in 1988? ; 8;
Boolean Expression
78; (big OR good OR grNEAR OR great OR hearty OR large OR million) NEAR (city OR town) NEAR (have OR hold OR
incorporate OR own OR possess OR read OR wear) NEAR (high) NEAR (percentage OR rate OR ratio) NEAR (assassination OR murder) NEAR (1988);20;

Original
79 What did Shostakovich write for Rostropovich?
Greek Manual Translation
79; Τι έγραψε ο Shostakovich για τον Rostropovich?
Systran Translation
79; What wrote the Shostakovich for the Rostropovich? ; 8;
Boolean Expression
79; (book OR capitalize OR compose OR dash OR make OR pencil OR

predestine OR put OR read OR will OR write) NEAR (Shostakovich) NEAR (about OR after OR at OR for OR of OR on OR over OR to OR towards) NEAR (Rostropovich);20;

Original
80 What is the name of the promising anticancer compound derived from the pacific yew tree?
Greek Manual Translation
80; Ποιό είναι το όνομα της πολλά υποσχόμενης αντικαρκινικής ένωσης που ξεκίνησε από το ειρηνικό δέντρο yew?
Systran Translation
80; Who is the name many of promising anticancer union that began from the peaceful tree yew? ; 8;
Boolean Expression
80; (is OR was) NEAR (appellation OR celebrity OR denomination OR fame OR izar OR name OR noun OR renown OR report OR reputation OR stature OR title) NEAR (lot OR much OR dog) NEAR (coalition OR compound OR enosis OR league OR unification OR union) NEAR (where OR whereabouts) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (eirenic OR pacific OR peaceable OR peaceful) NEAR (arbor OR tree) NEAR (yew);20;

Original
81 How many inhabitants live in the town of Ushuaia?
Greek Manual Translation
81; Πόσοι κάτοικοι ζουν στην πόλη Ushuaia?
Systran Translation
81; How much residents live in the city Ushuaia? ; 8;
Boolean Expression
81; (abider OR colonial OR denizen OR dweller OR habitant OR native OR occupant OR resident) NEAR (city OR town) NEAR (Ushuaia);20;

Original
82 How many consecutive baseball games did Lou Gehrig play?
Greek Manual Translation
82; Πόσα διαδοχικά παιχνίδια μπέιζ-μπώλ έπαιξε ο Lou Gehrig?
Systran Translation
82; How much successive games mpe'jz - did mpw'l play the Lou Gehrig? ; 8;
Boolean Expression
82; (consecutively) NEAR (game OR play OR toy) NEAR (dally OR enact OR fidget OR game OR gybe OR jiggle OR joggle OR monkey OR oscillate OR perform OR pipe OR play OR shoot OR sport OR toy OR trifle OR wriggle) NEAR (Lou) NEAR (Gehrig);20;

Original
83 What is the tallest building in Japan?

Greek Manual Translation
83; Ποιο είναι το πιό ψηλό κτήριο στην Ιαπωνία?
Systran Translation
83; Who is the tallest building in Japan? ; 8;
Boolean Expression
83; (is OR was) NEAR (more) NEAR (high) NEAR (Japan OR JaplNEAR);20;

Original
84 Which country is Australia's largest export market?
Greek Manual Translation
84; Ποια χώρα είναι μεγαλύτερη εξαγωγική αγορά της Αυστραλίας?
Systran Translation
84; Who country is bigger export market of Australia? ; 8;
Boolean Expression
84; (country OR INEAR OR nation OR power OR region) NEAR (is OR was) NEAR (big OR good OR grNEAR OR great OR hearty OR large OR million) NEAR (agora OR bazaar OR buy OR declaration OR emporium OR emption OR forum OR gaff OR market OR mart OR place OR purchase) NEAR (eduction OR exeresis OR export OR exportation OR extraction OR removal) NEAR (Australia);20;

Original
85 Which former Ku Klux Klan member won an elected office in the U.S.?
Greek Manual Translation
85; Ποιο πρώην μέλος της Ku Klux Klan κέρδισε εκλογικό γραφείο στις ΗΠΑ;
Systran Translation
85; Who former member of Ku Klux Klan gained electoral office in the USA? ; 8;
Boolean Expression
85; (erstwhile OR ex OR former OR late OR once OR one OR past OR quondam OR sometime) NEAR (colonial OR limb OR member OR music OR brother) NEAR (Ku) NEAR (Klux) NEAR (Klan) NEAR (earn OR gain OR make OR notch OR profit OR win) NEAR (electoral) NEAR (desk OR office OR writing) NEAR (deaf OR hear OR none OR tell OR wink);20;

Original
86 Who won two gold medals in skiing in the Olympic Games in Calgary?
Greek Manual Translation
86; Ποιος κέρδισε δύο χρυσά μετάλλια στο σκι στους ολυμπιακούς αγώνες του Κάλγκαρι?
Systran Translation
86; Who gained two golden medals in the ski in the Olympic fights of Calgary? ; 8;
Boolean Expression
86; (earn OR gain OR make OR notch OR profit OR win) NEAR (twa OR twain OR two) NEAR (aurum OR gold OR golden OR or OR yellow) NEAR (gong OR medal OR bravery) NEAR (ski) NEAR (battle OR bout OR cause OR combat OR

competition OR concours OR contest OR fight OR marathon OR struggle OR war) NEAR ;20;

Original
87 Who followed Willy Brandt as chancellor of the Federal Republic of Germany?
Greek Manual Translation
87; Ποιος διαδέχτηκε τον willy Brandt ως καγκελάριο της Ομοσπονδιακής Δημοκρατίας της Γερμανίας?
Systran Translation
87; Who succeeded the willy Brandt as chancellor of Federal Republic of Germany? ; 8;
Boolean Expression
87; (succeed OR supersede) NEAR (willy) NEAR (BrNEARt) NEAR (federal OR federative) NEAR (democracy OR majority) NEAR (Germania);20;

Original
88 What is Grenada's main commodity export?
Greek Manual Translation
88; Ποιά είναι η βασική εξαγωγή προϊόντων της Γρενάδας?
Systran Translation
88; Who it is the basic export of products of Grenada? ; 8;
Boolean Expression
88; (is OR was) NEAR (basal OR basic OR basilar OR elementary OR essential OR fundamental OR key OR main OR organic OR plain OR salient OR staple) NEAR (eduction OR exeresis OR export OR exportation OR extraction OR removal) NEAR (commodity OR proceeds OR produce OR product) NEAR ;20;

Original
89 At what age did Rossini stop writing opera?
Greek Manual Translation
89; Σε ποια ηλικία σταμάτησε ο Rossini την όπερα?
Systran Translation
89; In who age did stop the Rossini the opera? ; 8;
Boolean Expression
89; (whichever) NEAR (age OR time OR year) NEAR (Rossini) NEAR (opera OR comic OR opera);20;

Original
90 Who is the founder of Scientology?
Greek Manual Translation
90; Ποιος είναι ο ιδρυτής Scientology?
Systran Translation
90; Who is the founder Scientology? ; 8;
Boolean Expression
90; (is OR was) NEAR (father OR founder OR patriarch) NEAR (Scientology);20;

Original
91 Which city in China has the largest number of foreign financial companies?
Greek Manual Translation
91; Ποια πόλη στην Κίνα έχει το μεγαλύτερο αριθμό οικονομικά ξένων επιχειρήσεων?
Systran Translation
91; Who city in China has the bigger number of economically foreigner enterprises? ; 8;
Boolean Expression
91; (city OR town) NEAR (China) NEAR (have OR hold OR incorporate OR own OR possess OR read OR wear) NEAR (big OR
good OR grNEAR OR great OR hearty OR large OR million) NEAR (figure OR number OR numeral OR quantity OR tale) NEAR (budget OR cheap OR cut OR down OR economic OR economical OR low OR pecuniary OR saver) NEAR (alien OR
extraneous OR foreign OR foreigner OR outlNEARer OR outsider OR stranger OR correspondent) NEAR (business OR
company OR concern OR corporation OR enterprise OR establishment OR firm OR house OR operation OR undertaking OR

Original
92 Who released the Internet worm in the late 1980s?
Greek Manual Translation
92; Ποιος εξέδωσε το σκουλήκι του Διαδικτύου προς το τέλος της δεκαετίας του '80?
Systran Translation
92; Who published the worm of Internet to the end of decade the ' 80? ; 8;
Boolean Expression
92; (extradite OR give OR issue OR make OR publish OR write) NEAR (maggot OR worm) NEAR (at OR for OR on OR to OR
towards OR unto) NEAR (close OR conclusion OR death OR end OR finis OR finish OR impost OR last OR levy OR passing OR rate OR surcease) NEAR (decade) NEAR ;20;

Original
93 Who first circumnavigated the globe?
Greek Manual Translation
93; Ποιος έκανε πρώτος τον περίπλου της γης?
Systran Translation
93; Who made first the circumnavigation of ground? ; 8;
Boolean Expression
93; (be OR constitute OR cost OR do OR feign OR fit OR go OR leave OR make OR psych OR purpose OR render OR run OR send OR set OR take OR wage) NEAR (first OR front OR original OR primary OR prior) NEAR (circumnavigation) NEAR ;20;

Original
94 Who wrote the song, "Stardust"?
Greek Manual Translation
94; Ποιος έγραψε το τραγούδι, "Stardust"?
Systran Translation
94; Who wrote the song, "Stardust"? ; 8;
Boolean Expression
94; (book OR capitalize OR compose OR dash OR make OR pencil OR predestine OR put OR read OR will OR write) NEAR (song) NEAR (Stardust);20;

Original
95 What country is the worlds leading supplier of cannabis?
Greek Manual Translation
95; Ποιά χώρα είναι ο μεγαλύτερος προμυθευτής κάνναβης στη γη?
Systran Translation
95; Who ' country of is bigger promyceyti's cannabis in the ground? ; 8;
Boolean Expression
95; (country OR INEAR OR nation OR power OR region) NEAR (is OR was) NEAR (big OR good OR grNEAR OR great OR hearty OR large OR million) NEAR ;20;

Original
96 What time of day did Emperor Hirohito die?
Greek Manual Translation
96; Τι ωρα πέθανε ο αυτοκράτορας Hirohito?
Systran Translation
96; Which hour died the emperor Hirohito? ; 8;
Boolean Expression
96; (hour OR occasion OR period OR time) NEAR (away OR bucket OR conk OR croak OR cross OR debt OR depart OR die OR expire OR go OR life OR majority OR nature OR no OR pass OR peg OR snuff) NEAR (emperor) NEAR (Hirohito);20;

Original
97 How large is the Arctic refuge to preserve unique wildlife and wilderness value on Alaska's north coast?
Greek Manual Translation
97; Πόσο μεγάλο είναι το αρκτικό καταφύγιο για να συντηρήσει τη μοναδική αξία άγριας φύσης και αγριοτήτων στη βόρεια ακτή της Αλάσκας
Systran Translation
97; How much big is the Arctic shelter in order to it maintains the unique value of wild nature and ferocities in the northern
coast of Alaska ; 8;
Boolean Expression
97; (big OR good OR grNEAR OR great OR hearty OR large OR million) NEAR (is OR was) NEAR (arctic OR inchoative OR incipient) NEAR (bolt OR bosom

OR bunker OR cover OR dugout OR dugout OR harbourage OR haven OR hideaway OR laager OR preserve OR refuge OR reserve OR resort OR resource OR retreat OR sanctuary OR shelter) NEAR (about OR after OR at OR for OR of OR on OR over OR to OR towards) NEAR (keep OR maintain OR preserve OR run OR service OR support OR sustain) NEAR (alone OR class OR inimitable OR matchless OR nonesuch OR one OR only OR single OR singular

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Original
98 Where is the highest point in Japan?
Greek Manual Translation
98; Πού είναι το υψηλότερο σημείο στην Ιαπωνία?
Systran Translation
98; Where it is the higher point in Japan? ; 8;
Boolean Expression
98; (is OR was) NEAR (high) NEAR (angulation OR extent OR firing OR mark OR place OR point OR quarter OR sign OR spot) NEAR (Japan OR JaplNEAR);20;

Original
99 What is the term for the sum of all genetic material in a given organism?
Greek Manual Translation
99; Ποιος είναι ο όρος για το σύνολο όλου του γενετικού υλικού σε έναν δεδομένο οργανισμό?
Systran Translation
99; Who is the term on the total of all genetic material in a given organism? ; 8;
Boolean Expression
99; (is OR was) NEAR (article OR berg OR clause OR condition) NEAR (about OR after OR at OR for OR of OR on OR over OR to OR towards) NEAR (aggregate OR array OR caboodle OR commonalty OR ensemble OR gang OR group OR omnium OR outfit OR series OR set OR string OR sum OR total OR totality) NEAR (work) NEAR (genetic OR genetical OR genic OR code) NEAR (material OR matter OR stuff) NEAR (each OR one OR person OR some OR somebody) NEAR (datum OR fact OR datum) NEAR (bion OR body OR corporation OR edifice OR instrumentality OR organism OR service OR system);20;

Original
100 What is considered the costliest disaster the insurance industry has ever faced?
Greek Manual Translation
100; Ποιά θεωρείτε η δαπανηρότερη καταστροφή που έχει αντιμετωπίσει ποτέ η ασφαλιστική βιομηχανία?
Systran Translation
100; Who you consider the costlier destruction that has faced never the actuarial industry? ; 8;
Boolean Expression

100; (account OR attest OR call OR certify OR consider OR count OR deem OR hold OR look OR presume OR rank OR rate OR ratify OR reckon OR take OR treat OR validate OR vet OR view) NEAR (costly OR dear OR expensive OR posh OR rich) NEAR (calamity OR catastrophe OR destruction OR disaster OR disposal OR exode OR finish OR ravage OR ruin OR ruination OR undoing OR wreckage) NEAR (where OR whereabouts) NEAR (have OR hold OR incorporate OR own OR possess OR read OR wear) NEAR (combat OR confront OR contend OR counter OR cover OR deal OR discuss OR encounter OR face OR

Original
101 How many people live in the Falklands?
Greek Manual Translation
101; Πόσοι άνθρωποι ζουν στα Νησιά Falklands?
Systran Translation
101; How much persons live in the Islands Falklands? ; 8;
Boolean Expression
101; (bird OR bod OR cuss OR dude OR fellow OR homo OR human OR individual OR man OR omee OR person OR soul) NEAR (islNEAR OR isle OR islet) NEAR (FalklNEARs);20;

Original
102 Who is the Voyager project manager?
Greek Manual Translation
102; Ποιός είναι ο υπεύθυνος του σχεδίου Voyager?
Systran Translation
102; Who is the person in charge of drawing Voyager? ; 8;
Boolean Expression
102; (is OR was) NEAR (accountable OR answerable OR reliable OR responsible) NEAR (blueprint OR calculation OR design OR drawing OR figure OR idea OR pattern OR plan OR programme OR scheme) NEAR (Voyager);20;

Original
103 How many people died when the Estonia sank in 1994?
Greek Manual Translation
103; Πόσοι άνθρωποι πέθαναν όταν βυθίστηκε το Estonia το 1994?
Systran Translation
103; How much persons died when was sunk the Estonia in 1994? ; 8;
Boolean Expression
103; (bird OR bod OR cuss OR dude OR fellow OR homo OR human OR individual OR man OR omee OR person OR soul) NEAR (away OR bucket OR conk OR croak OR cross OR debt OR depart OR die OR expire OR go OR life OR majority OR nature OR no OR pass OR peg OR snuff) NEAR (as OR if OR when OR while) NEAR (dib OR dig OR dip OR dunk OR immerse OR plunge OR shipwreck OR sink OR steep OR submerge OR duck) NEAR (Estonia) NEAR (1994);20;

Original
104 What language is most commonly used in Bombay?
Greek Manual Translation
104; Ποια γλώσσα ο χρησιμοποιείται εβραίος στη Βομβάη?
Systran Translation
104; Who language is used Jew in the Bombay? ; 8;
Boolean Expression
104; (cheek OR jet OR language OR lingo OR sole OR speech OR style OR tongue) NEAR (apply OR bring OR call OR employ OR get OR play OR ply OR use) NEAR ;20;

Original
105 How many people does Honda employ in the U.S.?
Greek Manual Translation
105; Πόσους ανθρώπους απασχολεί η Honda στις ΗΠΑ?
Systran Translation
105; How much persons does occupy the Honda in the USA?; 8;
Boolean Expression
105; (bird OR bod OR cuss OR dude OR fellow OR homo OR human OR individual OR man OR omee OR person OR soul) NEAR (detain OR employ OR engage OR interest OR occupy OR work) NEAR (Honda) NEAR (deaf OR hear OR none OR tell OR wink);20;

Original
106 What is the second highest mountain peak in the world?
Greek Manual Translation
106; Ποια είναι η δεύτερη υψηλότερη κορυφή στον κόσμο?
Systran Translation
106; Who it is the second higher top in the world? ; 8;
Boolean Expression
106; (is OR was) NEAR (latter OR runner) NEAR (high) NEAR (aiguille OR apex OR crown OR head OR peak OR pinnacle OR tip OR top OR vertex) NEAR (commonwealth OR cosmos);20;

Original
107 When was China's first nuclear test?
Greek Manual Translation
107; Πότε έγινε η πρώτη πυρηνική δοκιμή της Κίνας?
Systran Translation
107; When did become the first nuclear trial of China? ; 8;
Boolean Expression
107; (be OR become OR come OR draw OR get OR go OR grow OR make OR meld OR turn) NEAR (first OR front OR original OR primary OR prior) NEAR (nuclear OR nuclear) NEAR (crack OR fling OR go OR rehearsal OR shot OR shy OR stab OR test OR trial OR try) NEAR (China);20;

Original
108 Which company created the Internet browser Mosaic?
Greek Manual Translation
108; Ποια εταιρεία δημιούργησε τον πλοηγητή Διαδικτύου Mosaic?
Systran Translation
108; Who company created ploigiti' Internet Mosaic? ; 8;
Boolean Expression
108; (beget OR being OR breed OR bring OR cause OR constitute OR create OR do OR establish OR found OR generate OR give OR make OR originate OR pose OR produce OR raise OR set OR start) NEAR (Mosaic);20;

Original
109 Where does Buzz Aldrin want to build a permanent, manned space station?
Greek Manual Translation
109; Πού θέλει να χτίσει έναν μόνιμα επανδρωμένο διαστημικό σταθμό ο Buzz Aldrin?
Systran Translation
109; Where it wants does build a permanently manned spatial station the Buzz Aldrin? ; 8;
Boolean Expression
109; (like OR please OR want OR will OR wish) NEAR (build OR construct OR erect) NEAR (each OR one OR person OR
some OR somebody) NEAR (chronic OR permanent OR regular OR set OR settled OR stNEARing OR substantive OR cap) NEAR (crew OR man) NEAR (space OR spatial) NEAR (station OR watershed OR broadcasting) NEAR (Buzz) NEAR
(Aldrin);20;

Original
110 Who killed Lee Harvey Oswald?
Greek Manual Translation
110; Ποιος σκότωσε το Lee Harvey Oswald?
Systran Translation
110; Who killed the Lee Harvey Oswald? ; 8;
Boolean Expression
110; (assassinate OR bag OR bump OR dead OR destroy OR do OR eliminate OR flog OR kill OR murder OR slay OR smite OR take) NEAR (Lee) NEAR (Harvey) NEAR (Oswald);20;

Original
111 How long does it take to travel from Tokyo to Niigata?
Greek Manual Translation
111; Πόση ώρα παίρνει το ταξίδι από το Τόκιο στη Νιγκάτα?
Systran Translation
111; How much hour takes the travel from the Tokyo in the Niigata? ; 8;
Boolean Expression

111; (hour OR occasion OR period OR time) NEAR (accommodate OR admit OR assume OR catch OR dab OR draw OR fit OR get OR have OR hold OR inherit OR mistake OR obtain OR pick OR presume OR receive OR remove OR seat OR shave OR shoot OR stomach OR strike OR take) NEAR (eyre OR faring OR journey OR travel OR trip OR voyage OR acquaint) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR ;20;

Original
112 Who is the President of Ghana?
Greek Manual Translation
112; Ποιος είναι ο Πρόεδρος της Γκάνας?
Systran Translation
112; Who is the Chairman of Ghana? ; 8;
Boolean Expression
112; (is OR was) NEAR (chairman OR president) NEAR ;20;

Original
113 What is the name of the medical condition in which a baby is born without a brain?
Greek Manual Translation
113; Ποιο είναι το όνομα της ιατρικής κατάστασης στην οποία ένα μωρό γεννιέται χωρίς εγκέφαλο?
Systran Translation
113; Who is the name of medical situation in which a baby is given birth without brain? ; 8;
Boolean Expression
113; (is OR was) NEAR (appellation OR celebrity OR denomination OR fame OR izar OR name OR noun OR renown OR report OR reputation OR stature OR title) NEAR (medicine) NEAR (case OR catalogue OR circumstance OR condition OR do OR go OR list OR nick OR order OR roll OR shape OR situation OR stNEARing OR state OR status OR table OR way) NEAR (any OR whoever) NEAR (each OR one OR person OR some OR somebody) NEAR (baby OR bambino OR poppet OR babble OR balderdash) NEAR (but OR ex OR minus OR sine OR without) NEAR (brain OR cerebrum OR egghead OR master OR

Original
114 How much stronger is the new vitreous carbon material invented by the Tokyo Institute of Technology compared with the material made from cellulose?
Greek Manual Translation
114; Πόσο ισχυρότερο το νέο γυάλινο υλικό άνθρακα που εφευρεύθηκε από το τεχνολογικό ίδρυμα του Τόκιο σε σχέση με το υλικό που γίνεται από την κυτταρίνη?
Systran Translation
114; The how much more powerful new glass material coal that efeyrey'cike from the technological institution of Tokyo

concerning the material that becomes from cellulose? ; 8;
Boolean Expression
114; (forceful OR influential OR long OR mighty OR potent OR powerful OR profound OR sound OR stiff OR strong OR
tenacious OR high) NEAR (is OR was) NEAR (fresh OR little OR new OR young) NEAR (material OR matter OR stuff) NEAR (carbon) NEAR (where OR whereabouts) NEAR (coin OR dream OR invent OR make) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (technological) NEAR (corporation OR establishment OR foundation OR institute OR institution OR trust) NEAR (affinity OR association OR bearing

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Original
115 What is Head Start?
Greek Manual Translation
115; Τι είναι το Head Start?
Systran Translation
115; What is the Head Start? ; 8;
Boolean Expression
115; (is OR was) NEAR (Head) NEAR (Start);20;

Original
116 Which team won the Super Bowl in 1968?
Greek Manual Translation
116; Ποια ομάδα κέρδισε το Super Bowl το 1968?
Systran Translation
116; Who team gained the Super Bowl in 1968? ; 8;
Boolean Expression
116; (bNEAR OR bracket OR cell OR field OR flock OR gang OR group OR outfit OR side OR team) NEAR (earn OR gain OR make OR notch OR profit OR win) NEAR (Super) NEAR (Bowl) NEAR (1968);20;

Original
117 What two researchers discovered the double-helix structure of DNA in 1953?
Greek Manual Translation
117; Ποιοί δύο ερευνητές ανακάλυψαν τη δομή διπλού έλικα του DNA το 1953?
Systran Translation
117; Who two researchers discovered the structure of double helix of DNA in 1953? ; 8;
Boolean Expression
117; (twa OR twain OR two) NEAR (groper OR researcher OR searcher) NEAR (discover OR find OR nose OR search OR
see OR sniff OR sus) NEAR (configuration OR constitution OR construct OR construction OR contexture OR fabric OR form OR pattern OR structure) NEAR (double OR dual OR gemellary OR twofold) NEAR (DNA) NEAR (1953);20;

Original
118 What percentage of the world's plant and animal species can be found in the Amazon forests?
Greek Manual Translation
118; Ποιο ποσοστό των παγκόσμιων φυτικών και ζωικών των ειδών μπορεί να βρεθεί στα δάση του Αμαζονίου?
Systran Translation
118; Who percentage the world plant and animal types can find itself in the forests of Amazon? ; 8;
Boolean Expression
118; (percentage OR rate OR ratio) NEAR (cosmic OR cosmopolitan OR global OR universal OR world OR worldwide) NEAR (vegetable) NEAR (NEAR OR et OR plus OR too OR with) NEAR (animal OR zoic) NEAR (article OR cast OR class OR commodity OR description OR form OR genus OR item OR kind OR manner OR sort OR species OR type) NEAR (can OR may) NEAR (catch OR come OR discover OR fetch OR find OR get OR hit OR meet OR obtain OR raise OR run OR think) NEAR (forest OR holt OR wood) NEAR (Amazon);20;

Original
119 What Nobel laureate was expelled from the Philippines before the conference on East Timor?
Greek Manual Translation
119; Ποιος νικητής Νόμπελ απελάθηκε από τις Φιλιππίνες πριν από τη διάσκεψη σχετικά με ανατολικό Timor?
Systran Translation
119; Who victor Nobel was expelled by the Philippines before the conference with regard to Eastern Timor? ; 8;
Boolean Expression
119; (vanguisher OR winner) NEAR (deport) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (ago OR before OR ere OR or OR previously OR to) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (conference OR meeting OR round OR table) NEAR (comparably OR rather OR regarding OR relatively) NEAR (east OR easterly OR eastern OR eastward) NEAR (Timor);20;

Original
120 Who held the endurance record for women pilots in 1929?
Greek Manual Translation
120; Ποιά είχε το ρεκόρ αντοχής για στις γυναίκες πιλότους το 1929?
Systran Translation
120; Who it had the record of resistance for in the women pilots in 1929? ; 8;
Boolean Expression
120; (enjoy OR fill OR hold OR know OR name OR occupy OR own OR possess OR understNEAR) NEAR (high) NEAR

(endurance OR resistance OR solidity OR stamina OR stoutness OR strength OR tenacity OR toughness OR wearability)
NEAR (about OR after OR at OR for OR of OR on OR over OR to OR towards) NEAR (broad OR dame OR lady OR petticoat OR piece OR sister OR wife OR woman) NEAR (airman OR fish OR flier OR pilot) NEAR (1929);20;

Original
121 Who won the first general election for President held in Malawi in May 1994?
Greek Manual Translation
121; Ποιος κέρδισε τις πρώτες προεδρικές εκλογές στο Μαλάουι τον Μάιο του 1994?
Systran Translation
121; Who gained the first presidential elections in Malawi in May 1994? ; 8;
Boolean Expression
121; (earn OR gain OR make OR notch OR profit OR win) NEAR (first OR front OR original OR primary OR prior) NEAR
(presidential) NEAR (choice OR eclogue OR election OR pick OR poll OR selection) NEAR ;20;

Original
122 Who is section manager for guidance and control systems at JPL?
Greek Manual Translation
122; Ποιος είναι ο διευθυντής του τμήματος καθοδήγησης και ελέγχου συστημάτων στην JPL?
Systran Translation
122; Who is the director of department of guidance and control of systems in the JPL? ; 8;
Boolean Expression
122; (is OR was) NEAR (controller OR department OR director OR governor OR head OR manager) NEAR (angulation OR branch OR catch OR department OR departmental OR desk OR division OR end OR part OR percentage OR piece OR point OR portion OR proportion OR section OR segment) NEAR (conduct OR guidance) NEAR (NEAR OR et OR plus OR too OR with) NEAR (check OR control OR elenchus OR examination OR grasp OR proof OR regulation OR report) NEAR (apparatus OR assembly OR contrivance OR edifice OR gear OR grid OR method OR practice OR system) NEAR (JPL);20;

Original
123 How many Vietnamese were there in the Soviet Union?
Greek Manual Translation
123; Πόσοι Βιετναμέζοι υπήρχαν στη Σοβιετική Ένωση?
Systran Translation
123; How much Vietnameses existed in the Soviet Union? ; 8;
Boolean Expression
123; (be OR exist OR occur) NEAR (Soviet OR soviet) NEAR (coalition OR compound OR enosis OR league OR unification OR union);20;

Original
124 What was Agent Orange used for during the Vietnam War?
Greek Manual Translation
124; Σε τι χρησιμοποιήθηκε ο Πορτοκαλί Πράκτορας κατά τη διάρκεια του πολέμου του Βιετνάμ?
Systran Translation
124; In what was used the Orange Agent at the duration of war of Vietnam? ; 8;
Boolean Expression
124; (apply OR bring OR call OR employ OR get OR play OR ply OR use) NEAR (agent OR contact) NEAR (after OR against OR alla OR anti OR at OR by OR con OR for OR of OR on OR per OR pro OR the OR to OR towards OR versus OR with) NEAR (duration OR floruit OR length OR run OR span OR term) NEAR (combat OR war) NEAR ;20;

Original
125 In what city is the US Declaration of Independence located?
Greek Manual Translation
125; Σε ποια πόλη βρίσκεται η αμερικανική δήλωση της ανεξαρτησίας?
Systran Translation
125; In who city is found the American statement of independence? ; 8;
Boolean Expression
125; (whichever) NEAR (city OR town) NEAR (catch OR come OR discover OR fetch OR find OR get OR hit OR meet OR
obtain OR raise OR run OR think) NEAR (bid OR call OR declaration OR pronouncement OR protestation OR return OR
statement) NEAR ;20;

Original
126 When did Israel begin turning the Gaza Strip and Jericho over to the PLO?
Greek Manual Translation
126; Πότε άρχισε το Ισραήλ να παραδίδει την λωρίδα της Γάζας και το Jericho πίσω στην PLO?
Systran Translation
126; When it began Israel to deliver the Gaza Strip and the Jericho behind in the PLO? ; 8;
Boolean Expression
126; (begin OR beginning OR commence OR enter OR fire OR go OR ground OR inchoate OR instigate OR institute OR mount OR proceed OR start OR strike) NEAR (Israeli OR Israelite) NEAR (deliver) NEAR (bNEAR OR fillet OR ribbon OR strip OR zone) NEAR (fisc) NEAR (NEAR OR et OR plus OR too OR with) NEAR (Jericho) NEAR (aback OR after OR around OR back OR behind OR past OR round) NEAR (PLO);20;

Original
127 Which city has the oldest relationship as a sister-city with Los Angeles?

Greek Manual Translation
127; Ποια πόλη έχει την παλαιότερη σχέση ως αδελφή-πόλη με το Λος □ντζελες?
Systran Translation
127; Who city has the older relation as brother - city with the Los ?ntzeles? ; 8;
Boolean Expression
127; (city OR town) NEAR (have OR hold OR incorporate OR own OR possess OR read OR wear) NEAR (affinity OR
association OR bearing OR concern OR connection OR footing OR intercourse OR proportion OR reference OR regard OR relation OR relationship OR relevance OR causal) NEAR (lotion OR lotion) NEAR ;20;

Original
128 Who was the second man to walk on the moon?
Greek Manual Translation
128; Ποιοw ήταν ο δεύτερος άνθρωπος που περπάτησε στο φεγγάρι?
Systran Translation
128; Was Pojow the second person that walked in the moon? ; 8;
Boolean Expression
128; (is OR was) NEAR (latter OR runner) NEAR (bird OR bod OR cuss OR dude OR fellow OR homo OR human OR individual OR man OR omee OR person OR soul) NEAR (where OR whereabouts) NEAR (thirty) NEAR (moon);20;

Original
129 How many times was pitcher, Warren Spahn, a 20-game winner in his 21 major league seasons?
Greek Manual Translation
129; Πόσες φορές ήταν pitcher ο Warren Spahn, νικητης σε 20 παιχνίδια στο 21ο πρωταθλήματα Major League?
Systran Translation
129; How much times were pitcher the Warren Spahn, victor in 20 games in 21st championships Major League? ; 8;
Boolean Expression
129; (case OR direction) NEAR (is OR was) NEAR (pitcher) NEAR (Warren) NEAR (Spahn) NEAR (vanguisher OR winner) NEAR (20) NEAR (game OR play OR toy) NEAR (21ο,) NEAR (Major) NEAR (League);20;

Original
130 When was Yemen reunified?
Greek Manual Translation
130; Πότε επανενώθηκε η Υεμένη?
Systran Translation
130; When epanenw'cike Yemen? ; 8;
Boolean Expression
130; ;20;

Original
131 Which Japanese car maker had its biggest percentage of sale in the domestic market?
Greek Manual Translation
131; Ποιος Ιαπωνικός κατασκευαστής αυτοκινήτων είχε το μεγαλύτερο ποσοστό πωλήσεων του στην τοπική αγορά?
Systran Translation
131; Who Iapwnjko's constructor of cars had his bigger percentage of sales in the local market? ; 8;
Boolean Expression
131; (builder OR constructor OR cutler OR maker) NEAR (auto OR autocar OR automobile) NEAR (have OR hold OR
incorporate OR own OR possess OR read OR wear) NEAR (big OR good OR grNEAR OR great OR hearty OR large OR million) NEAR (percentage OR rate OR ratio) NEAR (sale OR sell OR selling OR vending) NEAR (my) NEAR (local OR native OR topical) NEAR (agora OR bazaar OR buy OR declaration OR emporium OR emption OR forum OR gaff OR market OR mart OR place OR purchase);20;

Original
132 What is the capital of Uruguay?
Greek Manual Translation
132; Ποια είναι η πρωτεύουσα της Ουρουγουάης?
Systran Translation
132; Who it is the capital of Uruguay? ; 8;
Boolean Expression
132; (is OR was) NEAR (capital OR metropolis) NEAR ;20;

Original
133 What is the name for the technique of growing certain plants in soils contaminated with toxic metals, wherein the plants take up the toxic metals, are harvested, and the metals recovered for recycling?
Greek Manual Translation
133; Ποιο είναι το όνομα της τεχνικής του να μεγαλώνεις συγκεκριμένα φυτά σε χώματα μολυσμένα με τοξικά μέταλλα, κατα την οποία τα φυτά απορροφούν τα τοξικά μέταλλα, μαζεύονται και τα μέταλλα στέλνονται για ανακύκλωση?
Systran Translation
133; Who is the name of his technique you grow concrete plants in earth polluted with toxic metals, at which the plants do
absorb are the toxic metals, gathered and are the metals sent for recycling? ; 8;
Boolean Expression
133; (is OR was) NEAR (appellation OR celebrity OR denomination OR fame OR izar OR name OR noun OR renown OR report OR reputation OR stature OR title) NEAR (technical OR technician OR equipment) NEAR (breed OR bring OR grow OR lengthen OR nurture OR old OR rear) NEAR (concrete OR definite OR

determinate OR particular OR set OR special) NEAR (plant OR vegetable) NEAR (dirt OR earth OR ground OR INEAR OR soil OR terra) NEAR (attaint OR contaminate OR defile OR infect OR pollute) NEAR (intoxicant OR toxic) NEAR (chill OR metal) NEAR (after OR against OR alla OR anti OR at OR by OR con OR for

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Original
134 Where is it planned to berth the merchant ship, Lane Victory, which Merchant Marine veterans are converting into a
floating museum?
Greek Manual Translation
134; Που σχεδιάζετε να αγκυροβολίσει το εμπορικό πλοίο, Lane Victory, το οποίο έμποροι ναυτικοί το μετατρέπουν σε
πλωτό μουσείο?
Systran Translation
134; That you draw agkyrovolj'sej the commercial boat, Lane Victory, which tradesmen seamen him do change in navigable
museum? ; 8;
Boolean Expression
134; (contemplate OR dash OR describe OR design OR draw OR intend OR meditate OR plan OR plat OR propose) NEAR (anchor OR moor) NEAR (catchpenny OR commercial OR mercantile OR merchant OR trade OR trading) NEAR (ship OR vessel) NEAR (Lane) NEAR (Victory) NEAR (any OR whoever) NEAR (dealer OR monger OR trader OR coper) NEAR (marine OR mariner OR maritime OR nautical OR naval OR sailor OR seafarer OR seaman OR cadet OR midshipman) NEAR (ego OR I OR me OR myself OR self) NEAR (adapt OR alter OR commute OR convert OR make OR modify OR transmute) NEAR

Original
135 What famous communist leader died in Mexico City?
Greek Manual Translation
135; Ποιος διάσημος κομμουνιστικός ηγέτης πέθανε στην Πόλη του Μεξικού?
Systran Translation
135; Who famous communistic leader died in the Mexico-City? ; 8;
Boolean Expression
135; (celebrated OR famous OR great OR notable OR noted OR renowned OR superstar OR well) NEAR (captain OR head OR khan OR leader) NEAR (away OR bucket OR conk OR croak OR cross OR debt OR depart OR die OR expire OR go OR life OR majority OR nature OR no OR pass OR peg OR snuff) NEAR (city OR town) NEAR ;20;

Original
136 Who is the Queen of Holland?
Greek Manual Translation
136; Ποια είναι η βασίλισσα της Ολλανδίας?
Systran Translation

136; Who she is the king of Holland? ; 8;
Boolean Expression
136; (is OR was) NEAR (queen OR regina OR bee) NEAR ;20;

Original
137 Who is the president of the Spanish government?
Greek Manual Translation
137; Ποιος είναι ο Πρόεδρος της ισπανικής κυβέρνησης?
Systran Translation
137; Who is the Chairman of Spanish government? ; 8;
Boolean Expression
137; (is OR was) NEAR (chairman OR president) NEAR (administration OR cabinet OR government);20;

Original
138 What is the name of the normal process in all living things, including humans, in which cells are programmed to "commit suicide"?
Greek Manual Translation
138; Ποιο είναι το όνομα της φυσικής διαδικασίας σε όλους τους ζωντανούς οργανισμούς, συμπεριλαμβανομένων και των
ανθρώπων, κατα την οποία τα κυτταρα είναι προγραμματισμένα να "αυτοκτονούν"?
Systran Translation
138; Who is the name of natural process in all the live organisms, included the also persons, at which the cells are
programmed "aytoktonoy'n "? ; 8;
Boolean Expression
138; (is OR was) NEAR (appellation OR celebrity OR denomination OR fame OR izar OR name OR noun OR renown OR report OR reputation OR stature OR title) NEAR (intrinsic OR natural OR philosopher OR physical OR unsophisticated OR unstudied) NEAR (borrowing OR channel OR course OR formality OR procedure OR process OR radio) NEAR (all OR entire OR whole) NEAR (alive OR animate OR live OR living OR quick OR vivid) NEAR (bion OR body OR corporation OR edifice OR instrumentality OR organism OR service OR system) NEAR (NEAR OR et OR plus OR too OR with) NEAR (bird OR bod OR

Original
139 How many people did the United Nations commit to help restore order and distribute humanitarian relief in Somalia in
September 1992?
Greek Manual Translation
139; Πόσους ανθρώπους δέσμευτηκαν να βοηθήσουν τα Ηνωμένα Έθνη να αποκαταστήσουν την ταξη και να διανείμουν
ανθρωπιστική βοήθεια στη Σομαλία τον Σεπτέμβριο του 1992?
Systran Translation
139; How much persons they committed to help the United Nations to restore the

order and to distribute humanitarian help in Somalia in September 1992? ; 8;
Boolean Expression
139; (bird OR bod OR cuss OR dude OR fellow OR homo OR human OR individual OR man OR omee OR person OR soul) NEAR (aid OR assist OR befriend OR help OR relieve OR succour) NEAR (country OR ethnos OR lNEAR OR nation OR people OR power) NEAR (array OR category OR class) NEAR (array OR category OR class) NEAR (NEAR OR et OR plus OR too OR with) NEAR (apportion OR dispense OR distribute OR give OR hNEAR OR issue OR ration OR send OR serve) NEAR (humane OR humanistic) NEAR (aid OR assistance OR backing OR hNEAR OR help OR rescue OR service OR succour) NEAR ;20;

Original
140 How many people on the ground were killed from the bombing of Pan Am Flight 103 over Lockerbie, Scotland, December 21, 1988?
Greek Manual Translation
140; Πόσοι άνθρωποι σκοτώθηκαν στο έδαφος από το βομβαρδισμό της πτήσης Pan Am 103 πάνω από το Lockerbie στης Σκωτίας στις 21 Δεκεμβρίου 1988?
Systran Translation
140; How much persons were killed in the territory by the bombardment of flight Everything Am 103 above the Lockerbie of
stis Scotland on 21 December 1988? ; 8;
Boolean Expression
140; (bird OR bod OR cuss OR dude OR fellow OR homo OR human OR individual OR man OR omee OR person OR soul) NEAR (assassinate OR bag OR bump OR dead OR destroy OR do OR eliminate OR flog OR kill OR murder OR slay OR smite OR take) NEAR (deck OR earth OR ground OR lNEAR OR soil OR terra OR terrain OR territory) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (bombardment OR bombing) NEAR (flight OR flying) NEAR (Pan) NEAR (Am) NEAR (103) NEAR (aboard OR atop OR on OR

Original
141 What is the duration of the trip from Bristol to London by rail?
Greek Manual Translation
141; Ποια είναι η διάρκεια του ταξιδιού από το Μπρίστολ στο Λονδίνο με τραίνο?
Systran Translation
141; Who it is the duration of travel from Bristol in London with train? ; 8;
Boolean Expression
141; (is OR was) NEAR (duration OR floruit OR length OR run OR span OR term) NEAR (eyre OR faring OR journey OR travel OR trip OR voyage OR acquaint) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (boat);20;

Original
142 What is the population of Ulan Bator, capital of Mongolia?
Greek Manual Translation
142; Ποιος είναι ο πληθυσμός του Ulan Bator, πρωτεύουσα της Μογγολίας?
Systran Translation
142; Who is the population of Ulan Bator, capital of Mongolia? ; 8;
Boolean Expression
142; (is OR was) NEAR (population) NEAR (Ulan) NEAR (Bator) NEAR (capital OR metropolis) NEAR ;20;

Original
143 Where does most of the marijuana entering the United States come from?
Greek Manual Translation
143; Από που προέρχεται η περισσότερη μαριχουάνα που μπαίνει στις Ηνωμένες Πολιτείες?
Systran Translation
143; From that emanates the more marijuana that enters in the United States? ; 8;
Boolean Expression
143; (where OR whereabouts) NEAR (accrue OR come OR derive OR originate OR stem) NEAR (lot OR much OR dog) NEAR (grass OR marijuana OR weed) NEAR (where OR whereabouts) NEAR (catch OR come OR dig OR draw OR enter OR get OR go OR join OR savvy OR shrink OR step OR tackle) NEAR (body OR city OR crown OR deportment OR government OR polity OR republic OR state);20;

Original
144 How many megawatts will the power project in Indonesia, built by a consortium headed by Mission Energy of US,
produce?
Greek Manual Translation
144; Πόσα μεγαβάτισχύ θα παράγει το σχέδιο ενέργιας στην Ινδονησία που χτίζεται από μια κοινοπραξία που διευθύνεται από την Mission Energy των ΗΠΑ?
Systran Translation
144; How many megava'tjshy' it will produce the drawing ene'rgjas in Indonesia that is built by a consortium that is directed by the Mission Energy of USA? ; 8;
Boolean Expression
144; (ascendancy OR dint OR force OR horsepower OR leverage OR might OR mightiness OR potency OR power OR
puissance OR stress OR tooth OR validity OR drawing OR pull) NEAR (bring OR do OR generate OR make OR manufacture OR produce OR turn OR yield) NEAR (chare OR deed OR labour OR mission OR piece OR project OR task OR undertaking OR work) NEAR (act OR action OR energy OR move OR power OR step OR thing) NEAR (where OR whereabouts) NEAR (build OR construct OR erect) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR

Original
145 What did John Hinckley do to impress Jodie Foster?
Greek Manual Translation
145; Τι John έκανε ο Hinckley για να εντυπωσιάσει τη Jodie Foster?
Systran Translation
145; Which John made the Hinckley in order to it impresses the Jodie Foster? ; 8;
Boolean Expression
145; (be OR constitute OR cost OR do OR feign OR fit OR go OR leave OR make OR psych OR purpose OR render OR run OR send OR set OR take OR wage) NEAR (John) NEAR (Hinckley) NEAR (about OR after OR at OR for OR of OR on OR over OR to OR towards) NEAR (dash OR figure OR go OR impress OR splash OR strike OR thunder) NEAR ;20;

Original
146 In what year did Ireland elect its first woman president?
Greek Manual Translation
146; Ποιά χρονιά εξέλεξε η Ιρλανδία την πρώτη γυναίκα πρόεδρο?
Systran Translation
146; Who year elected Ireland the first woman chairman? ; 8;
Boolean Expression
146; (year) NEAR (choose OR elect) NEAR (emerald OR Erin OR green) NEAR (first OR front OR original OR primary OR prior) NEAR (broad OR dame OR lady OR petticoat OR piece OR sister OR wife OR woman) NEAR (chairman OR president);20;

Original
147 Who is the prime minister of Japan?
Greek Manual Translation
147; Ποιος είναι ο πρωθυπουργός της Ιαπωνίας?
Systran Translation
147; Who is the Prime Minister of Japan? ; 8;
Boolean Expression
147; (is OR was) NEAR (premier) NEAR (Japan OR JaplNEAR);20;

Original
148 How many soldiers were involved in the last Panama invasion by the United States of America?
Greek Manual Translation
148; Πόσοι στρατιώτες ενεπλάκησαν στην τελευταία εισβολή του Παναμά από τις Ηνωμένες Πολιτείες της Αμερικής;
Systran Translation
148; How much soldiers were involved in the last invasion of Panama from the United States of America? ; 8;
Boolean Expression

148; (enlist OR pawn OR private OR soldier) NEAR (embrangle OR embroil OR enmesh OR ensnarl OR entangle OR gear OR
immerse OR immesh OR implicate OR intermesh OR involve OR INEAR OR tangle OR throw) NEAR (bottom OR hindmost OR last OR late OR latter OR rearmost) NEAR (aggression OR foray OR infestation OR inroad OR invasion OR irruption OR onrush OR onset OR onslaught) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (body OR city OR crown OR deportment OR government OR polity OR

Original
149 Where is the Bulls basketball team based?
Greek Manual Translation
149; Που είναι η βάση της ομάδας καλαθοσφαίρισης Bulls?
Systran Translation
149; That is the base of team of basketball Bulls? ; 8;
Boolean Expression
149; (is OR was) NEAR (base OR basis OR foot OR footing OR ground OR holder OR mount OR premise OR rack OR shoe OR stNEAR OR station OR stock OR strength OR support) NEAR (bNEAR OR bracket OR cell OR field OR flock OR gang OR group OR outfit OR side OR team) NEAR (basket) NEAR (Bulls);20;

Original
150 What is the length of border between the Ukraine and Russia?
Greek Manual Translation
150; Ποιο είναι το μήκος των συνόρων μεταξύ της Ουκρανίας και της Ρωσίας?
Systran Translation
150; Who is the length of borders between Ukraine and Russia? ; 8;
Boolean Expression
150; (is OR was) NEAR (extent OR length OR run OR yardage) NEAR (border OR bound OR boundary OR frontier) NEAR
(among OR between) NEAR (NEAR OR et OR plus OR too OR with) NEAR ;20;

Original
151 Where did Dylan Thomas die?
Greek Manual Translation
151; Πού πέθανε η Dylan Thomas?
Systran Translation
151; Where did die the Dylan Thomas? ; 8;
Boolean Expression
151; (away OR bucket OR conk OR croak OR cross OR debt OR depart OR die OR expire OR go OR life OR majority OR
nature OR no OR pass OR peg OR snuff) NEAR (Dylan) NEAR (Thomas);20;

Original
152 How many people live in Tokyo?
Greek Manual Translation
152; Πόσοι άνθρωποι ζουν στο Τόκιο?
Systran Translation
152; How much persons live in the Tokyo? ; 8;
Boolean Expression
152; (bird OR bod OR cuss OR dude OR fellow OR homo OR human OR individual OR man OR omee OR person OR soul) NEAR ;20;

Original
153 What is the capital of California?
Greek Manual Translation
153; Ποια ειναι η πρωτεύουσα της Καλιφόρνιας?
Systran Translation
153; Who they is the capital of Kaljfo'rnjas? ; 8;
Boolean Expression
153; (being OR is OR must) NEAR (capital OR metropolis) NEAR ;20;

Original
154 How many Grand Slam titles did Bjorn Borg win?
Greek Manual Translation
154; Πόσους τίτλους Grand Slam κέρδισε ο Bjorn Borg?
Systran Translation
154; How much titles Grand Slam did gain the Bjorn Borg? ; 8;
Boolean Expression
154; (appellation OR championship OR designation OR honour OR security OR style OR title) NEAR (GrNEAR) NEAR (Slam) NEAR (earn OR gain OR make OR notch OR profit OR win) NEAR (Bjorn) NEAR (Borg);20;

Original
155 Who was the Democratic nominee in the American presidential election?
Greek Manual Translation
155; Ποιος ήταν ο υποψήφιος των δημοκρατικών στις αμερικάνικες προεδρικές εκλογές?
Systran Translation
155; Who was the candidate democratic in the American presidential elections? ; 8;
Boolean Expression
155; (is OR was) NEAR (applicant OR aspirant OR cNEARidate OR contestant OR prospective) NEAR (democratic) NEAR (presidential) NEAR (choice OR eclogue OR election OR pick OR poll OR selection);20;

Original
156 When was General Manuel Noriega ousted as the leader of Panama and turned over to U.S. authorities?

Greek Manual Translation
156; Πότε αντικαταστάθηκε ο στρατηγός Manuel Noriega από ηγέτης του Παναμά και παραδόθηκε στις ΑΜΕΡΙΚΑΝΙΚΈΣ αρχές?
Systran Translation
156; When was replaced the general Manuel Noriega from leader of Panama and was delivered in the AMERICAN beginnings?
; 8;
Boolean Expression
156; (general) NEAR (Manuel) NEAR (Noriega) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (captain OR head OR khan OR leader) NEAR (NEAR OR et OR plus OR too OR with) NEAR (deliver) NEAR (authority OR beginning OR break OR commencement OR creed OR estate OR inception OR inchoation OR initiation OR maxim OR offset OR opening OR origination OR outset OR postulate OR power OR precept OR principle OR rule OR set OR stNEARard OR start);20;

Original
157 Where is Dartmouth College?
Greek Manual Translation
157; Πού είναι το κολλέγιο του Dartmouth ?
Systran Translation
157; Where it is the college of Dartmouth? ; 8;
Boolean Expression
157; (is OR was) NEAR (Dartmouth);20;

Original
158 How many mines can still be found in the Falklands after the war ended?
Greek Manual Translation
158; Πόσες νάρκες μπορουν ακόμα να βρεθουν στα Νησιά Φόλκλαντ μετά από το τέλος του πολέμου?
Systran Translation
158; How much mines can still find themselves in the Islands Fo'lklant after the end of war? ; 8;
Boolean Expression
158; (dormancy OR lethargy OR mine OR stupor) NEAR (any OR anymore OR even OR further OR still OR yet) NEAR (islNEAR OR isle OR islet) NEAR (after OR afterwards OR cum OR following OR on OR round OR then OR upon OR with) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR inadvertence) NEAR (close OR conclusion OR death OR end OR finis OR finish OR impost OR last OR levy OR passing OR
rate OR surcease) NEAR (combat OR war);20;

Original
159 Why are electric cars less efficient in the north-east than in California?

Greek Manual Translation
159; Γιατί τα ηλεκτρικά αυτοκίνητα είναι λιγότερο αποδοτικά στα βορειοανατολικά απ' οτι στη Καλιφόρνια?
Systran Translation
159; Why the electric cars are more efficient in north-eastern that in the Kaljfo'rnja? ; 8;
Boolean Expression
159; (electric OR electrical OR succinic) NEAR (auto OR autocar OR automobile) NEAR (is OR was) NEAR (little OR mite OR remotely OR slightly OR somewhat OR more) NEAR ;20;

Original
160 When did French revolutionaries storm the Bastille?
Greek Manual Translation
160; Πότε επιτέθηκαν οι Γάλλοι επαναστάτες στη Βαστίλη?
Systran Translation
160; When did attack the French rebels in the Vastj'li? ; 8;
Boolean Expression
160; (append OR apply OR superimpose OR superpose) NEAR (French) NEAR (rebel OR revolutionary) NEAR ;20;

Original
161 How rich is Bill Gates?
Greek Manual Translation
161; Πόσο πλουσιος είναι ο Bill Gates?
Systran Translation
161; How much rich is the Bill Gates? ; 8;
Boolean Expression
161; (abundant OR affluent OR exuberant OR floppy OR full OR generous OR lush OR moneyed OR opulent OR plentiful OR profuse OR prolific OR rich OR strong OR voluminous OR wanton OR wealthy OR wide) NEAR (is OR was) NEAR (Bill) NEAR (Gates);20;

Original
162 What is the capital of Kosovo?
Greek Manual Translation
162; Ποιά είναι η πρωτεύουσα του Κοσόβου?
Systran Translation
162; Who it is the capital of Kosovo? ; 8;
Boolean Expression
162; (is OR was) NEAR (capital OR metropolis) NEAR ;20;

Original
163 What state does Charles Robb represent?
Greek Manual Translation
163; Ποιο κράτος εκπροσωπεί Charles Robb?

Systran Translation
163; Who state represents Charles Robb? ; 8;
Boolean Expression
163; (body OR country OR government OR grip OR imperium OR might OR mightiness OR nation OR power OR puissance) NEAR (body OR front OR represent) NEAR (Charles) NEAR (Robb);20;

Original
164 Who is the leading competitor of Trans Union Company?
Greek Manual Translation
164; Ποιός είναι ο βασικός ανταγωνιστής της εταιρείας Trans Union?
Systran Translation
164; Who is the basic competitor of company Trans Union? ; 8;
Boolean Expression
164; (is OR was) NEAR (basal OR basic OR basilar OR elementary OR essential OR fundamental OR key OR main OR organic OR plain OR salient OR staple) NEAR (antagonist OR competitor) NEAR (Trans) NEAR (Union);20;

Original
165 Which type of submarine was bought recently by South Korea?
Greek Manual Translation
165; Ποιος τύπος υποβρυχίου αγοράστηκε πρόσφατα από τη Νότιο Κορέα?
Systran Translation
165; Who type submarine was bought recently from the Southerner Korea? ; 8;
Boolean Expression
165; (bird OR bloke OR bod OR brew OR cast OR chap OR chappie OR codger OR cookie OR cove OR cuss OR customer OR description OR dog OR estate OR fish OR form OR formality OR formula OR gestalt OR guy OR individual OR make OR manner OR model OR mould OR pattern OR press OR print OR shape OR sort OR species OR specimen OR type OR version) NEAR (submarine) NEAR (bid OR buy OR call OR declare OR get OR purchase) NEAR (freshly OR just OR lately OR new) NEAR (beforehNEAR OR by OR ex OR from OR of OR off OR on OR over OR since OR than OR through OR to OR with OR

Original
166 When did communist control end in Hungary?
Greek Manual Translation
166; Πότε τελείωσε ο κομμουνιστικός έλεγχος στην Ουγγαρία?
Systran Translation
166; When you finish the communistic control in Hungary? ; 8;
Boolean Expression
166; (break OR cease OR clear OR close OR complete OR conclude OR do OR end OR finish OR get OR give OR go OR pass OR run OR sign OR terminate OR end OR smoke OR up) NEAR (check OR control OR elenchus OR examination OR grasp OR proof OR regulation OR report) NEAR ;20;

Original
167 What nationality is Pope John Paul II?
Greek Manual Translation
167; Ποιά είναι η υπηκοότητα του Πάπα Ιωάννη Παύλου του Δεύτερου?
Systran Translation
167; Who it is the citizenship of Priest Ioannis Pay'loy Second? ; 8;
Boolean Expression
167; (is OR was) NEAR (national) NEAR (holy) NEAR (latter OR runner);20;

Original
168 Who was the captain of the tanker, Exxon Valdez, involved in the oil spill in Prince William Sound, Alaska, 1989?
Greek Manual Translation
168; Ποιος ήταν ο καπετάνιος του βυτιοφόρου, Exxon Valdez, που είχε αναμειχθεί στη διαροή πετρελαίου στο Prince William
Sound, της Αλάσκας, το 1989?
Systran Translation
168; Who was the captain of tanker, Exxon Valdez, that had been mixed in djaroi' oil in the Prince William Sound, Alaska, in
1989? ; 8;
Boolean Expression
168; (is OR was) NEAR (captain OR chieftain OR master OR sea OR shipmaster OR skipper OR war) NEAR (Exxon) NEAR (Valdez) NEAR (where OR whereabouts) NEAR (have OR hold OR incorporate OR own OR possess OR read OR wear) NEAR (escape OR leak OR leakage OR seepage) NEAR (oil) NEAR (Prince) NEAR (William) NEAR (Sound) NEAR (1989);20;

Original
169 Whom did the Chicago Bulls beat in the 1993 championship?
Greek Manual Translation
169; Ποιούς κέρδισαν οι Chicago Bulls στο πρωτάθλημα του 1993?
Systran Translation
169; Who did gain the Chicago Bulls in the championship 1993? ; 8;
Boolean Expression
169; (earn OR gain OR make OR notch OR profit OR win) NEAR (Chicago) NEAR (Bulls) NEAR (1993);20;

Original
170 Who was President of Afghanistan in 1994?
Greek Manual Translation
170; Ποιος ήταν Πρόεδρος του Αφγανιστάν το 1994?
Systran Translation
170; Who was Chairman of Afghanistan in 1994? ; 8;
Boolean Expression
170; (is OR was) NEAR (chairman OR president) NEAR (1994);20;

Original
171 Who is the director of intergovernmental affairs for the San Diego county?
Greek Manual Translation
171; Ποιος είναι ο διευθυντης των διακυβερνητικών υποθέσεων για το νομό του Σαν Ντιέγκο?
Systran Translation
171; Who is the director of intergovernmental affairs for his prefecture As Ntje'gko? ; 8;
Boolean Expression
171; (is OR was) NEAR (controller OR department OR director OR governor OR head OR manager) NEAR (affair OR
assumption OR business OR case OR concern OR do OR guess OR hypothesis OR job OR matter OR presumption OR
proposition OR question OR shebang OR show OR speculation OR story OR supposal OR supposition OR surmise OR theory OR thing) NEAR (about OR after OR at OR for OR of OR on OR over OR to OR towards) NEAR (act) NEAR (as OR for OR like OR bat OR lightning) NEAR ;20;

Original
172 Where is the Keck telescope?
Greek Manual Translation
172; Πού είναι το τηλεσκόπιο Keck?
Systran Translation
172; Where it is the telescope Keck? ; 8;
Boolean Expression
172; (is OR was) NEAR (telescope) NEAR (Keck);20;

Original
173 How many moons does Jupiter have?
Greek Manual Translation
173; Πόσα φεγγάρια έχει ο Δίας?
Systran Translation
173; How much moons does have the Jupiter? ; 8;
Boolean Expression
173; (moon) NEAR (have OR hold OR incorporate OR own OR possess OR read OR wear) NEAR (Jove OR Jupiter OR
Zeus);20;

Original
174 When did Jaco Pastorius die?
Greek Manual Translation
174; Πότε πέθανε ο Jaco Pastorius?
Systran Translation
174; When did die the Jaco Pastorius? ; 8;
Boolean Expression
174; (away OR bucket OR conk OR croak OR cross OR debt OR depart OR die

OR expire OR go OR life OR majority OR
nature OR no OR pass OR peg OR snuff) NEAR (Jaco) NEAR (Pastorius);20;

Original
175 When did beethoven die?
Greek Manual Translation
175; Πότε πέθανε ο Beethoven?
Systran Translation
175; When did die the Beethoven? ; 8;
Boolean Expression
175; (away OR bucket OR conk OR croak OR cross OR debt OR depart OR die
OR expire OR go OR life OR majority OR
nature OR no OR pass OR peg OR snuff) NEAR (Beethoven);20;

Original
176 How many people in Tucson?
Greek Manual Translation
176; Πόσοι άνθρωποι υπάρχουν στο Tucson;
Systran Translation
176; How much persons exist in the Tucson? ; 8;
Boolean Expression
176; (bird OR bod OR cuss OR dude OR fellow OR homo OR human OR
individual OR man OR omee OR person OR soul) NEAR (be OR exist OR occur)
NEAR (Tucson);20;

Original
177 How tall is Mt. Everest?
Greek Manual Translation
177; Πόσο ψηλό είναι το όρος Everest?
Systran Translation
177; How much tall is the term Everest? ; 8;
Boolean Expression
177; (high) NEAR (is OR was) NEAR (article OR berg OR clause OR condition)
NEAR (Everest);20;

Original
178 What is the capital of Congo?
Greek Manual Translation
178; Ποιά είναι η πρωτεύουσα του Κογκό?
Systran Translation
178; Who it is the capital of Congo? ; 8;
Boolean Expression
178; (is OR was) NEAR (capital OR metropolis) NEAR (Congolese);20;

Original
179 What is the capital of Italy?

Greek Manual Translation
179; Ποιά είναι η πρωτεύουσα της Ιταλίας?
Systran Translation
179; Who it is the capital of Italy? ; 8;
Boolean Expression
179; (is OR was) NEAR (capital OR metropolis) NEAR (Italianate);20;

Original
180 What is the capital of Sri Lanka?
Greek Manual Translation
180; Ποιά είναι η πρωτεύουσα της Sri Lanka?
Systran Translation
180; Who it is the capital of Sri Lanka? ; 8;
Boolean Expression
180; (is OR was) NEAR (capital OR metropolis) NEAR (RgFwOr) NEAR ;20;

Original
181 What novel inspired the movie BladeRunner?
Greek Manual Translation
181; Ποιο μυθιστόρημα ενέπνευσε την ταινία BladeRunner?
Systran Translation
181; Who novel inspired the film BladeRunner? ; 8;
Boolean Expression
181; (fiction OR novel) NEAR (arouse OR commNEAR OR imbue OR infuse OR inspire OR stir OR suggest OR whip) NEAR (bNEAR OR cinefilm OR cingulum OR commissure OR fillet OR picture OR ribNEAR OR ribbon OR sash OR streak OR tape OR tapeworm) NEAR (RgFwOr);20;

Original
182 What was the first Gilbert and Sullivan opera?
Greek Manual Translation
182; Ποιά ήταν η πρώτη όπερα Gilbert και Sullivan?
Systran Translation
182; Who it was the first opera Gilbert and Sullivan? ; 8;
Boolean Expression
182; (is OR was) NEAR (first OR front OR original OR primary OR prior) NEAR (opera OR comic OR opera) NEAR (RgFwOr) NEAR (NEAR OR et OR plus OR too OR with) NEAR ;20;

Original
183 What was the name of the computer in "2001: A Space Odyssey"?
Greek Manual Translation
183; Ποιό ήταν το όνομα του υπολογιστή στο "2001: A Space Odyssey"?
Systran Translation
183; Who was the name of computer in the "2001: A Space Odysseus "? ; 8;
Boolean Expression

183; (is OR was) NEAR (appellation OR celebrity OR denomination OR fame OR izar OR name OR noun OR renown OR report OR reputation OR stature OR title) NEAR (calculating) NEAR (2001) NEAR (A) NEAR (Space) NEAR (Odyssey);20;

Original
184 When was Queen Victoria born?
Greek Manual Translation
184; Πότε γεννήθηκε η βασίλισσα Victoria?
Systran Translation
184; When was given birth the king Victoria? ; 8;
Boolean Expression
184; (queen OR regina OR bee) NEAR (Odyssey);20;

Original
185 When was the battle of the Somme fought?
Greek Manual Translation
185; Πότε έγινε η μάχη του Somme?
Systran Translation
185; When did become the battle of Somme? ; 8;
Boolean Expression
185; (be OR become OR come OR draw OR get OR go OR grow OR make OR meld OR turn) NEAR (action OR battle OR
combat OR encounter OR fight OR fighting) NEAR (Somme);20;

Original
186 Where did the Battle of the Bulge take place?
Greek Manual Translation
186; Που έλαβε χώρα η μάχη του Bulge?
Systran Translation
186; That did take place the battle of Bulge? ; 8;
Boolean Expression
186; (get OR have OR obtain OR read OR receive OR take) NEAR (country OR INEAR OR nation OR power OR region) NEAR (action OR battle OR combat OR encounter OR fight OR fighting) NEAR (Bulge);20;

Original
187 Where was Lincoln assassinated?
Greek Manual Translation
187; Πού δολοφονήθηκε ο Linkoln?
Systran Translation
187; Where dolofoni'cike the Linkoln? ; 8;
Boolean Expression
187; (assassinate OR hit) NEAR (Linkoln);20;

Original
188 When was the women's suffrage amendment ratified?
Greek Manual Translation
188; Πότε επικυρώθηκε η τροποποίηση ψήφου των γυναικών?
Systran Translation
188; When was ratified the modification of vote of women? ; 8;
Boolean Expression
188; (affirm OR certify OR conclude OR execute OR legalize OR legalise OR ratify OR execute) NEAR (alteration OR change OR modification OR qualification) NEAR (suffrage OR voice OR vote OR confidence) NEAR (broad OR dame OR lady OR petticoat OR piece OR sister OR wife OR woman);20;

Original
189 Where is Qatar?
Greek Manual Translation
189; Πού είναι το Κατάρ?
Systran Translation
189; Where it is the Qatar? ; 8;
Boolean Expression
189; (is OR was) NEAR (curse OR imprecation OR malediction OR accursed OR bloody OR confounded OR cursed OR damned);20;

Original
190 Where is South Bend?
Greek Manual Translation
190; Που είναι το South Bend?
Systran Translation
190; That is the South Bend? ; 8;
Boolean Expression
190; (is OR was) NEAR (South) NEAR (Bend);20;

Original
191 Where was Harry Truman born?
Greek Manual Translation
191; Που γεννήθηκε ο Harry Truman?
Systran Translation
191; That was given birth the Harry Truman? ; 8;
Boolean Expression
191; (Harry) NEAR (Truman);20;

Original
192 Who was Secretary of State during the Nixon administration?
Greek Manual Translation
192; Ποιος ήταν γραμματέας του κράτους κατά τη διάρκεια της διοικησης Nixon?
Systran Translation

192; Who was secretary of state at the duration of administration Nixon? ; 8;
Boolean Expression
192; (is OR was) NEAR (amanuensis OR clerk OR registrar OR secretary OR clerk) NEAR (body OR country OR government OR grip OR imperium OR might OR mightiness OR nation OR power OR puissance) NEAR (after OR against OR alla OR anti OR at OR by OR con OR for OR of OR on OR per OR pro OR the OR to OR towards OR versus OR with) NEAR (duration OR floruit OR length OR run OR span OR term) NEAR (administration OR commNEAR) NEAR (Nixon);20;

Original
193 Who was the 16th President of the United States?
Greek Manual Translation
193; Ποιος ήταν 16ος Πρόεδρος των Ηνωμένων Πολιτειών
Systran Translation
193; Who was 16th Chairman of United States? ; 8;
Boolean Expression
193; (is OR was) NEAR (16th) NEAR (chairman OR president) NEAR (body OR city OR crown OR deportment OR government OR polity OR republic OR state);20;

Original
194 Who wrote "The Pines of Rome"?
Greek Manual Translation
194; Ποιος έγραψε το "The Pines of Rome"?
Systran Translation
194; Who wrote the "The Pines of Rome"? ; 8;
Boolean Expression
194; (book OR capitalize OR compose OR dash OR make OR pencil OR predestine OR put OR read OR will OR write) NEAR (The) NEA(Pines) NEAR (of) NEAR (Rome);20;

Original
195 Who wrote "Dubliners"?
Greek Manual Translation
195; Ποιος έγραψε το "Dubliners"?
Systran Translation
195; Who wrote the "Dubliners "? ; 8;
Boolean Expression
195; (book OR capitalize OR compose OR dash OR make OR pencil OR predestine OR put OR read OR will OR write) NEAR (Dubliners);20;

Original
196 Who wrote "Hamlet"?
Greek Manual Translation
196; Ποιος έγραψε το "Hamlet"?

Systran Translation
196; Who wrote the "Hamlet "? ; 8;
Boolean Expression
196; (book OR capitalize OR compose OR dash OR make OR pencil OR predestine OR put OR read OR will OR write) NEAR (Hamlet);20;

Original
197 What did Richard Feynman say upon hearing he would receive the Nobel Prize in Physics?
Greek Manual Translation
197; Τι είπε ο Richard Feynman όταν άκοθσε οτι θα ελάμβανε το βραβείο Νόμπελ φυσικής?
Systran Translation
197; What did say the Richard Feynman when a'kocse that it would receive the Nobel price physics? ; 8;
Boolean Expression
197; (go OR pitch OR read OR say OR shoot OR spit OR tell OR utter) NEAR (Richard) NEAR (Feynman) NEAR (as OR if OR when OR while) NEAR (hear OR heed OR listen) NEAR (ought OR what) NEAR (get OR have OR obtain OR read OR receive OR take) NEAR (accolade OR award OR prix OR prize) NEAR (intrinsic OR natural OR philosopher OR physical OR unsophisticated OR unstudied);20;

Original
198 How did Socrates die?
Greek Manual Translation
198; Πως πεθανε ο Σωκράτης?
Systran Translation
198; That did die the Swkra'tis? ; 8;
Boolean Expression
198; (unmourned) NEAR ;20;

Original
199 How tall is the Matterhorn?
Greek Manual Translation
199; Πόσο ψηλό είναι το Matterhorn?
Systran Translation
199; How much tall is the Matterhorn? ; 8;
Boolean Expression
199; (high) NEAR (is OR was) NEAR (Matterhorn);20;

Original
200 How tall is the replica of the Matterhorn at Disneyland?
Greek Manual Translation
200; Πόσο ψηλό είναι το αντίγραφο του Matterhorn στη Disneyland?
Systran Translation

200; How much tall is the copy of Matterhorn in the Disneyland?; 8;
Boolean Expression
200; (high) NEAR (is OR was) NEAR (apograph OR copy OR duplicate OR echo OR ectype OR replica) NEAR (Matterhorn) NEAR (DisneylNEAR);20;

Appendix C: Translation of Question Word by Systran for TREC-8

Translation of Question Word by Question		
Question	Original	Translation
1	Who	Who
2	What	Who
3	What	What
4	How+Adj	How+Adj
5	What	Who
6	Why	Why
7	What	Which
8	What	Who
9	How+Adj	How+Adj
10	Name	Unidentified
11	Who	Who
12	How+Much+	How+Adj
13	How+Adj	How+Adj
14	What	Who
15	When	When
16	What	Who
17	How+Adj	How+Much+
18	Who	Who
19	Who	Who
20	Where	Unidentified
21	Who	Who
22	When	When
23	When	When
24	When	When
25	Who	Who
26	What	Who
27	Where	Unidentified
28	Who	Who
29	What	Who
30	What	Who
31	Where	Unidentified
32	Who	Who
33	What	Who
34	Where	Unidentified
35	What	Who
36	What	Who

Translation of Question Word by Question		
Question	Original	Translation
37	What	Who
38	Where	Unidentified
39	Who	Who
40	Who	Who
41	What	Who
42	What	Who
43	What	Who
44	Who	Who
45	When	When
46	Who	Who
47	What	Who
48	Where	Unidentified
49	Who	Who
50	When	When
51	Who	Who
52	Who	Who
53	Who	Who
54	When	When
55	Where	Unidentified
56	How+Adj	How+Adj
57	What	Who
58	Name	Name
59	Who	Who
60	What	How+Adj
61	What	Who
62	What	Who
63	What	Who
64	Who	Who
65	Name	Name
66	Name	Name
67	What	Who
68	What	What
69	Who	Who
70	How+Adj	How+Adj
71	What	Who
72	When	When

Translation of Question Word by Question		
Question	Original	Translation
73	Where	Where
74	Who	Who
75	What	Who
76	Which	Who
77	Who	Who
78	Which	Who
79	What	What
80	What	Who
81	How+Adj	How+Adj
82	How+Adj	How+Adj
83	What	Who
84	Which	Who
85	Which	Who
86	Who	Who
87	Who	Who
88	What	Who
89	What	Who
90	Who	Who
91	Which	Who
92	Who	Who
93	Who	Who
94	Who	Who
95	What	Who
96	What	Which
97	How+Adj	How+Much+
98	Where	Where
99	What	Who
100	What	Who
101	How+Adj	How+Adj
102	Who	Who
103	When	When
104	What	Who
105	How+Adj	How+Adj
106	What	Who
107	When	When
108	Which	Who
109	Where	Where
110	Who	Who
111	How+Adj	How+Adj
112	Who	Who
113	What	Who
114	How+Much+	How+Adj

Translation of Question Word by Question		
Question	Original	Translation
115	What	What
116	Which	Who
117	What	Who
118	What	Who
119	What	Who
120	Who	Who
121	Who	Who
122	Who	Who
123	How+Adj	How+Adj
124	What	What
125	What	Who
126	When	When
127	Which	Who
128	Who	Unidentified
129	How+Adj	How+Much+
130	When	When
131	Which	Who
132	What	Who
133	What	Who
134	Where	Which
135	What	Who
136	Who	Who
137	Who	Who
138	What	Who
139	How+Adj	How+Much+
140	How+Adj	How+Much+
141	What	Who
142	What	Who
143	Where	Unidentified
144	How+Adj	How+Adj
145	What	Which
146	What	Who
147	Who	Who
148	How+Adj	How+Adj
149	Where	Unidentified
150	What	Who
151	Where	Where
152	How+Adj	How+Adj
153	What	Who
154	How+Adj	How+Adj
155	Who	Who
156	When	When

Translation of Question Word by Question		
Question	Original	Translation
157	Where	Where
158	How+Adj	How+Much+
159	Why	Why
160	When	When
161	How+Adj	How+Adj
162	What	Who
163	What	Who
164	Who	Who
165	Which	Who
166	When	When
167	What	Who
168	Who	Who
169	Whom	Who
170	Who	Who
171	Who	Who
172	Where	Where
173	How+Adj	How+Much+
174	When	When
175	When	When
176	How+Adj	How+Adj
177	How+Adj	How+Adj
178	What	Who
179	What	Who

Translation of Question Word by Question		
Question	Original	Translation
180	What	Who
181	What	Who
182	What	Who
183	What	Who
184	When	When
185	When	When
186	Where	Unidentified
187	Where	Where
188	When	When
189	Where	Where
190	Where	Unidentified
191	Where	Unidentified
192	Who	Who
193	Who	Who
194	Who	Who
195	Who	Who
196	Who	Who
197	What	What
198	Basic How	Unidentified
199	How+Adj	How+Adj
200	How+Adj	How+Adj

Unidentified question words in the translation column mean that our question word determination script was not capable of determining the question word.

Appendix D: ILSPs POS Tagger Tag Set

1. Noun
1.1 Type
Cm Common
βιβλίο NoCmNeSgNm
Pr Proper
Γιώργος NoPrMaSgNm
1.2 Gender
Ma Masculine
ουρανός NoCmMaSgNm
Fe Feminine
καρέκλα NoCmFeSgNm
Ne Neuter
βιβλίο NoCmNeSgNm
1.3 Number
Sg Singular
ουρανός NoCmMaSgNm
Pl Plural
βιβλία NoCmNePlNm
1.4 Case
Nm Nominative
βιβλίο NoCmNeSgNm
Ge Genitive
τραπεζιού NoCmNeSgGe
Ac Accusative
παιδί NoCmNeSgAc
Da Dative
καιρώ NoCmMaSgDa
Vo Vocative
Γιάννη NoPrMaSgVo

2. Adjective
2.1 Degree
Ba Basic
ψηλός AjBaMaSgNm
Cp Comparative
μεγαλύτερος AjCpMaSgNm
Su Superlative
πυκνότατος AjSuMaSgNm
2.2 Gender, number, and case
As with nouns

3. Numeral
3.1 Type
Cd Cardinal
ένας NmCdMaSgNmAj
Od Ordinal
πρώτος NmOdMaSgNmAj
Ml Multiplicative
τριπλός NmMlMaSgNmAj
An Analog
τριπλάσιος NmAnMaSgNmAj
Ct Collective
τριάδα NmCtFeSgNmNo
3.2 Gender, number, and case
As with nouns
3.3 Function
Aj Adjectival
τετραπλάσιος NmMlMaSgNmAj
No Nominal
τετράδα NmCtFeSgNmNo
Ad Adverbial
τετραπλάσια NmAnXxXxXxAd

4. Article
4.1 Type
Df Definite
το AtDfNeSgNm
Id Indefinite
ένα AtIdNeSgNm
4.2 Gender, number, and case
As with nouns

5. Verb
5.1 Type
Mn Main
γράφω VbMn
Is Impersonal
βρέχει VbIs
5.2 Finiteness/Mood
Id Indicative
γράφω VbMnId
Mp Imperative
γράψε VbMnMp
Nf Infinitive
(έχει) γράψει VbMnNf
Pp Participle
γράφοντας VbMnPp
5.3 Tense
Pr Present
γράφω VbMnIdPr

Pa Past
έγραψα VbMnIdPa
Xx No value
(έχει) γράψει VbMnNfXx
(να) γράψει VbMnIdXx
5.4 Person
01
γράφω VbMnIdPr01
02
γράφεις VbMnIdPr02
03
γράφει VbMnIdPr03
Xx No value
(έχει) γράψει VbMnNfXxXx
γραμμένος VbMnPpXxXx
αλλά
(να) γράψει VbMnIdXx03
5.5 Number
Sg Singular
γράφεις VbMnIdPr02Sg
Pl Plural
γράφουμε VbMnIdPr01Pl
Xx No value
(έχει) γράψει VbMnNfXxXxXx
αλλά
(να) γράψει VbMnIdXx03Sg
5.6 Gender
Ma
εισαγμένος VbMnPpXxXxSgMa
Fe
Ne
Xx No value
γράφουμε VbMnIdPr01PlXx
5.7 Aspect
Ip Imperfective
γράφουμε VbMnIdPr01PlXxIp
Pe Perfective
γράψουμε VbMnIdXx01PlXxPe
5.8 Voice
Av Active
παίζουμε VbMnIdPr01PlXxIpAv
Pv Passive
παίζονται VbMnIdPr01PlXxIpPv
5.9 Case
Nm Nominative
εισαγμένος VbMnPpXxXxSgMaPePvNm
Ge
Ac
Da
Vo
Xx No value

παίζουμε VbMnIdPr01PlXxIpAvXx

6. Pronoun
6.1 Type
Pe Personal
εγώ PnPe01MaSgNmSt
Dm Demonstrative
εκείνος PnDm03MaSgNmXx
Po Possessive
σου PnPo02MaSgGeXx
Id Indefinite
κάτι PnId03NeSgNmXx
Ir Interrogative
ποια PnIr03FeSgNmXx
Re Relative
οποία PnRe03FeSgNmXx
Ri Relative Indefinite
όποια PnRi03FeSgNmXx
6.2 Inflection
St Strong
εγώ PnPe01MaSgNmSt
We Weak
με PnPe01MaSgAcWe
Xx No Value
All other pronouns

7. Adverb
7.1 Type
Xx
7.2 Degree
Ba Basic
ψηλά AdXxBa
Cp Comparative
ακριβότερα AdXxCp
Su Superlative
ακριβότατα AdXxSu

8. Adposition (= Preposition)
8.1 Type
AsPp
8.2 Form
Sp Simple
σε AsPpSp
Pa Prepart
στον AsPpPaMaSgAc
8.3 Gender, number and case
The three tags for gender, number and case, exist only for AsPpPa
9. Conjunction
9.1 Type
Co Coordinative

και CjCo
Sb Subordinative
ότι CjCo
10. Interjection
10.1 Ij Interjection
Αλί Ij

11. Particles
11.1 Type
Fu Future
θα PtFu
Ne Negative
μην PtNe
Sj Subjunctive
να PtSj
Ot Other
που PtOt

12. Residual
12.1 Type
Fw Foreign Word
Τσόμσκυ RgFwTr
Ab Abbreviation
κιλ. RgAbXx
An Acronym
OHE RgAnXx
Sy Symbol
\ RgSyXx
12.2 Transliteration
Tr Transliterated
Τσόμσκυ RgFwTr
Or Original
Chomsky RgFwOr
Xx No Value
OHE RgAnXx