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SENTENCE ORDERING IN MULTI DOCUMENT SUMMARY USING LOCALISED CONTEXTUAL INFORMATION

Ansamma John[1], Dr. M Wilscy[2]

[1]Research Scholar, Department of Computer Science
University of Kerala, Kariavattom,, Kerala-, 695581, India
ansamma.john.@gmail.com
[2] Head of the Department, Department of Computer Science
University of Kerala, Kariavattom,, Kerala-, 695581, India
wilsyphilipose@gmail.com

Abstract: *Relevance of automatic multi document summarization system increases day by day due to the availability of huge amount of textual data in the Internet. Multi document summarization system generate generic summary by extracting most relevant sentences from the input documents. Sentences are ranked based on statistical and /or linguistic information and sentences with high ranks are extracted to generate the summary. Generic summary generated automatically by extraction method may not guarantee cohesion, since summary holds sentences from multiple documents in a random manner. In this paper, we propose a sentence ordering method, which organizes the sentences in the generated summary to improve cohesion. The way the first sentence opens up the topic determines the overall readability of the summary. The most important step in our work is to identify the most appropriate sentence that is to be placed as the first sentence. Overall cohesion of summary is improved, if sentences are related to each other. Positions of remaining sentences are identified by maximizing the similarity between the consecutive sentences through the construction of maximum cost spanning tree using localized contextual information. Our system increases understandability and readability of the summary.*

Keywords: *Multi document summarization, Sentence Ordering, Spanning tree*.

1. INTRODUCTION

Document summarization has attracted a lot of researchers in recent years due to the availability of enormous amount of text data on the World Wide Web and lack of time to peruse them to understand the core concept in them. Situation become more critical if a lot of documents corresponding to the same topic are available. Automatic text summarization is the process of providing the succinct form of the document [1]. Depending upon the number of input documents handled by the summarizer at a time summarization can be classified as single document or multi document summarization [1][2]. Based on the approach adopted, summarization process can be classified as extractive or abstractive summarization. Extractive summarizers gather salient sentences from the input document to generate the summary [1][3][4]. In abstractive approach summary is generated by rephrasing the main concepts in the input documents. Abstractive summarization can be performed using natural language processing techniques and it is time consuming.

Research is going on to improve the quality of the summary generated in terms of conciseness, accuracy and objectivity. Conciseness specifies the degree of density of condensation of the input documents. Accuracy is the degree to which the reader can understand the view point of the document by reading the summary. Accuracy of the summary can be increased by gathering sentences with maximum relevance and content coverage. Objectivity assures that summary provides only the original document's view point.

Extractive summarizer rank the sentences based on some ranking algorithm and high ranked sentences are selected for the summary [5][6][7]. So in extractive summary conciseness can be preserved by limiting the number of sentences to be included in the summary and accuracy can be ensured by devising most appropriate ranking techniques. Extractive summaries are produced by the selection of sentences from the input document without any refinement, so they always preserve objectivity property.

Summaries generated by the extractive summarizer may not be coherent. So meaning of the summary will be lost to a great extent and it may not make sense. Coherency of single document summary can be achieved by reordering the sentences in the summary based on their positions in the input document. Generating coherent multiple document summary is a challenging task, since summary is generated from multiple documents written by different authors with different background knowledge.

In this paper, we propose a sentence ordering method to organize the sentences within a multi-document summary by analyzing the direct and indirect local information associated with the sentences in the summary. Our method identifies the most appropriate opening sentence of the summary and remaining sentences are arranged such that similarity between the successive sentences are maximized by analyzing the neighbouring sentences in the original document. A study is also performed to identify the number of local sentences to be considered for getting the most appropriate ordering. Evaluation of the proposed method is done by the summary generated for the DUC 2002 data set. Ordering is performed by our work and the results are evaluated by human evaluators. Results show that our ordering improves the overall readability of the summary.

The paper is organized as follows. In section 2 we present related work of our study. In section 3 we describe proposed work of ordering. Experimental result in section 4. In section 5 we present our conclusion.

2. LITERATURE REVIEW

Barzilay et al., 2002 [8] introduced majority ordering based on the thought that multi document summary has different themes and ordering can be performed based on the themes. Sentences in input documents are grouped into different themes and sentences are ordered based on the order of the themes. This system faces difficulty in grouping sentences into themes and proper arrangement of sentences within a topic. They also introduced chronological ordering where sentences are ordered based on their publishing time. Ordering is further improved by combining topic relatedness and chronological ordering.

Lapata (2003) [9] ordering is performed by evaluating conditional probabilities of sentence pairs. The conditional probability of a pair of sentences is calculated by conditional probability of feature pairs occurring in two sentences. Using greedy algorithm optimal global ordering of sentences is attained. The experiment results show that its readability of ordered summary is good compared to extracted summary without ordering.

Bollegala et al. [10] established the ordering by combining chronological, probabilistic, topic relatedness information associated with the sentences. How to combine these three information is determined by machine learning approach.

Gongfu Peng et al. [11] sentences for the summary are recognized using support vector machine and these sentences are ordered using Grey Model.

Furu Wei et al. [12] provided a graph based query specific summarization method, where vertices represent sentences. Edge weight is calculated using query sensitive information. Based on the semantic similarity between the words in the document, terms are assigned with a metric. Sentences are ordered based on the semantic similarity between sentences by using semantic similarity of words.

Yanxiang He et al. [13] formulated a sentence ordering for Chinese language by analyzing the logical order between adjacent sentences using Markov model. Transition probabilities in Markov model is calculated using term weight.

In this paper we propose a graph based approach to order the sentences in the extractive summary to improve the cohesiveness of the summary. Proposed method is explained in the next section.

3. PROPOSED METHOD

Generic multi document summary, generated by an extractive summarizer, is a collection of relevant and novel sentences selected from random positions of different input documents. So multi document summaries may lack coherence and cohesion, thereby reducing the overall readability of the summary. Cohesion can be improved, by keeping relevant sentences, by ordering of sentences, by keeping linking words in successive sentences and by keeping repetition of keywords related to main ideas in the summary. By selecting appropriate ranking technique relevance of the sentences and repetition of key words can be achieved automatically in extractive summary. Even then summary may not provide logical clarity. Process of relocating the sentences within the summary to increase the cohesion, readability and understandability is termed as ordering. So ordering can be placed as the last step of the summarization system to improve the overall quality of the summary.

Techniques using information such as chronological, cause effect, and compare and contrast are available for manual ordering of sentences. Ordering of sentences using these criteria is possible if summary is generated by abstraction. In extractive summarization system these methods may not work well with limited number of sentences selected from the random positions of the input document set.

We propose a sentence ordering method by finding the most appropriate sentence within the summary that is to be placed as the first sentence within the ordered summary to improve the cohesion. The way the first sentence, opens up the summary, determines the overall quality of the summary. Cohesion can be improved by developing the concept of the entire document set gradually from one sentence to another, starting from the first sentence. This is achieved by repositioning the sentences such that similarity between the successive sentences in the summary is maximized. Most of the sentences that appear within the summary may not have very high direct similarity among them. But some sentences in the summary may be related to some other preceding sentences in the original document of other sentences in the summary. How many such preceding sentences are to be considered for checking the similarity between the sentences in the summary to maintain the flow within the summary is also a critical problem. We developed an ordering method by considering the neighboring sentences of the summary sentences. Ordering is performed in three steps sentence transformation, graph based summary representation and construction of maximum weight spanning tree using localized information.

Let the summary is to be generated from multiple document set $D = \{D_1, D_2, D_3, ..., D_d\}$ of 'd' documents. Documents may contain a lot of information which may not be interesting from summarization view point. So document set is preprocessed to improve the efficiency of further processing. Preprocessing is done using three steps: segmentation to separate sentences from the document, stop word removal removes the words which does not have specific meaning from summarization perspective and stemming to represent the root form of the words in sentences to reduce the total number of words in the overall document. Let $\boldsymbol{m}$ be the number of unique stemmed words available in the entire document set after preprocessing. Each sentence in the document is represented as a vector using Vector Space Model (VSM), where each sentence is a vector of $\boldsymbol{m}$ dimension and i^{th} item of the vector represents the frequency count of i^{th} stemmed word in the sentence. Using an extractive summarization method sentences in the input documents are ranked based on the relevance and highly ranked $\boldsymbol{n'}$ sentences are selected to the extractive summary (ES) where $\boldsymbol{n'} \leq \boldsymbol{n}$. Ordering is performed on these $\boldsymbol{n'}$ sentences.

For processing purpose entire document set is represented as a single document with ***n*** sentences where, n_i is the number of sentences in the i^{th} document. Document set D can be represented as a collection of sentences, D = { S_{11}, S_{12}, …, S_{1n1}, S_{21}, S_{22}, …, S_{2n2}, ..., S_{d1}, S_{d2}, .., S_{dnd}}, where S_{ij} is the j^{th} sentence in i^{th} document. The order in which the documents are processed does not influence the remaining processing steps. So document D can be considered as a collection of n sentences, D= { S_1, S_2, S_3, …, S_n}. For each sentence $S_i \epsilon$ D, a data structure is maintained with the information such as first sentence flag to indicate whether that sentence is a first sentence of any one of the documents in the document set or not, indices of other identical sentences in the document set, VSM representation of the sentence (VS_i) and Cosine similarity between sentences S_i and S_j is calculated as given below summary flag indicating the presence or absence of the sentence in the summary. Two sentences say S_i and S_j are similar if the cosine similarity between them are greater than a threshold which can be controlled as required. Cosine similarity between sentences S_i and S_j is calculated as given below

$$CosineSimilarity(S_i, S_j) = \frac{\sum_{k=1}^{m} f_{ik} * f_{jk}}{\sqrt{\sum_{k=1}^{m} f_{ik}^2 * \sum_{k=1}^{m} f_{jk}^2}} \quad (1)$$

where f_{ik} *is the frequency of* k^{th} *term in* VS_i
f_{jk} - *frequency of* k^{th} *term in* VS_j

From the analysis of different documents it is evident that the first sentence of a document that opens up a topic has minimum similarity with other sentences. So the first sentence to be placed in the summary can be identified in the following way. Three cases are encountered here: 1) If there is only one sentence within the summary with first sentence flag is set that sentence will be considered as the first sentence of the ordered summary. 2) If more number of sentences are there in the summary whose first sentence flag is set then take the sentence which has minimum similarity with all other sentences in the document set. 3) If there is no sentence in summary with first sentence flag is set state then select a sentence in the summary which has minimum similarity with all other sentences in the document set as the first sentence.

Ordered summary always maintains connectivity between the sentences. Two sentences are adjacent within the summary, if the similarity between them is high compared to other sentences. By considering the sentences which are available in the summary alone for ordering process may not end up with a good result due to the diversity of sentences in the extractive summary. So ordering is performed not only by considering the sentences in the summary, but also considering few sentences preceding them in the original document set because these sentences convey more background information. After identifying the first sentence, remaining sentences are repositioned to get an ordered summary. If (i-1) sentences in the summary are ordered we can find the i^{th} sentence of the ordered summary by determining the pair wise cosine similarity between the each remaining unordered sentences in the summary and $(i-1)^{th}$ sentence in the ordered summary together with its local and global neighbours in the original document set. Local neighbors are the sentences preceding the current sentence and the global neighbours are the sentences preceding the similar sentences in the entire document set. A sentence which has maximum similarity with $(i-1)^{th}$ ordered sentence together with its neighbours become i^{th} ordered sentence.

To order the sentences within the summary, we are representing the summary as an undirected graph G = (V, E) where V is the set of vertices, |V| = n' = |ES| and E be the set of edges between every pair of vertices V_i and V_j such that $1 \leq i \leq n'$, $1 \leq j \leq n'$ and $i \neq j$. ie. Sentences in the summary ES act as the vertices of G. In each vertex V_i, we are keeping the vector representation of S_i (VS_i) and the a neighbor vector $S_i\alpha$ of S_i ($VS_{i\alpha}$), a vector formed by combining α local and global preceding neighbouring sentences of S_i. Edge weight W_{ij} is computed as the cosine similarity between the vector of S_j and $S_i\alpha$ vectors in V_i. A maximum weight spanning tree is constructed starting from the source vertex which is the first sentence node. The order in which vertices are included into the spanning tree indicates the order of the sentence in the ordered summary. By varying the value of α, study is performed to see the proximity or number of preceding sentences that influence the ordering process. Complete steps of ordering process is given in Algorithm1.

Algorithm 1: Ordering of sentences in summary.

Input: Sentences of summary generated by extractive summarizer (ES) and the input document set D.

α - Integer value indicating number of preceding sentences to be considered for ordering

Output: Ordered summary say OS, of extractive summary ES

Procedure Order (ES)

1. Call Preprocess (D)
2. For each sentence $S_i \epsilon$ D create vector VS_i, a vector representation of S_i with term frequency of stemmed words
3. Call Create_Similar _Sentence_List (ES, D)
4. Call Create_neighborvector(ES)
5. Call Create_weight_matrix(ES)
6. Find First Sentence say S_c from ES and place it in ordered summary OS. Update ES = ES – {S_c}.
7. Select the sentence S_l that is placed most recently in the ordered summary OS
8. Find a sentence $S_c \epsilon$ ES such that weight_mat(l,c) is maximum.
9. ES= ES- {S_c}, Add S_c to OS
10. If ES is not empty go to step 7 else return OS.

End procedure

Algorithm 2 gives the detailed preprocessing steps performed on the input document set. It separates sentences from the documents and creates a vector for each sentence in the document set which can be used for the further processing.

Algorithm 2. Preprocessing of document set D

Procedure preprocess (D)

1. **for** each document Di ϵ D do
2. Perform Segmentation to get Di = { Si1, Si2, …, Sini}
3. Perform Tokenizing
4. Perform Stop word removal.

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5. **end for**
6. return document D as set of sentence vectors {VS1, VS2, …, VSn}using term frequency of stemmed tokens.
7. **end procedure**

First step in the identification of global information associated with each sentences Sj in the summary is to determine the similar sentences of Sj in the entire input document set D using Algorithm 3.

Algorithm 3: Similar sentence list construction

procedure Create_Similar_Sentence_List (ES, D)

1. **for** each sentence S_j ϵ ES **do**
2. similar sentence list SSL(j) ← Φ
3. end for
4. **for** each sentence S_i ϵ D **do**
5. **for** each sentence S_j ϵ ES **do**
6. if CosineSimilarity (Si,Sj) > threshold
7. SSL(j) ← SSL(j) ∪ {i}
8. **end for**
9. **end for**
10. **return** SSL
11. **end procedure**

Local neighbouring information of each sentence in the summary can be determined using Algorithm 4 which takes extractive summary ES, similar sentence list (SSL) created by algorithm 3 and α as the input and creates a neighbor vector $S_{i\alpha}$, for each S_i ϵ ES. Algorithm 5 specifies the most important step in the computation of the maximum cost spanning tree which determines the similarity between the i^{th} sentence and the $(i-1)^{th}$ sentence together with its neighbours.

Algorithm 4: Creation of neighbouring sentence vector

procedure create_neighborvector (ES,SSL)

1. **for** each sentence S_i ϵ ES **do**
2. VSiα = VS_i
3. **for** each k ϵ SSL(S_i)**do**
4. **for** p =1 to α
5. VSiα= VSiα +VS_{i-p} // S_{i-p} ϵ D
6. **end for**
7. **end for**
8. **end for**
9. **end procedure**

Algorithm 5: Creation of similarity matrix

procedure create_Weight_matrix (ES,SSL)

1. **for** each sentence S_i ϵ ES **do**
2. **for** each sentence S_j ϵ ES**do**
3. weight_mat(i,j) = CosineSimilarity(VSiα,Sj)
4. **end for**
5. **end for**
6. **end procedure**

Pictorial representation of the algorithm is given in Figure 1, for a summary with seven sentences. A complete graph is constructed and a spanning tree is constructed as per the above algorithm. Vertex number indicates the position of the sentences in the ordered summary. For this example, sentence order after the construction of spanning tree is [s1,s7,s4,s5,s6,s3,s2]. Thick lines starting from the First sentence node indicate the spanning tree.

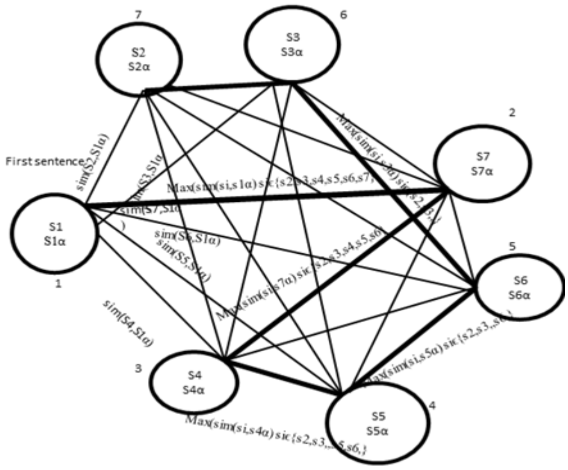

Figure 1: Ordering of sentences within a summary.

4. EXPERIMENTAL ANALYSIS

Analysis of the proposed system is done using multiple document sets corresponding to different topics taken from DUC 2002 data set. DUC 2002 data set has four categories of data set. We have taken 25 such data sets of four categories, where each set consist of more than 7 documents. Summaries of size 50, 100, 200, 400 and 500 words generated by extractive sentence ranking system are ordered using our ordering system. No appropriate automatic methods are available to evaluate the ordered summary. It is very difficult to score the ordering of sentences within the summary, since it is purely subjective. Some automatic methods available for the evaluation of sentence ordering are not comprehensive or mature. So we made, an opinion survey based evaluation, with 5 human experts to score the ordering of sentences for various summary length and for different values of α – the number of preceding sentences in the original document set of the sentences in the summary to be considered for the ordering. The three grades fixed for the evaluation are good, average and poor. A good summary is a text that maintains cohesion and conveys the idea of the document in a clear way. An average summary is one that makes sense, and logical clarity is not maintained due to lack of cohesion. Further revision is required to achieve better readability. A poor summary is one that loses cohesion at some places, and will not convey the entire concept of the document in a clear manner. We used 25 summary and 5 human expert to evaluate it and we got 125 score for each α. Result of the evaluation is shown in Table 1.

Table1: Result of human Evaluation

α	Good	Average	Poor
unordered	0	7	118
0	45	59	21
1	81	27	17
2	98	18	9
3	77	30	18
4	32	54	39

From Table 1 it is clear that good ordering is obtained when two neighbouring sentences (ie. α =2) of the sentences in the

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summary are considered for ordering, since they reveal more related information about the sentences in the summary. By considering only one neighbouring sentence (α=1) the amount of local information obtained is less and not getting good result but readability is better than without ordering or ordering without considering the neighbourhood sentences. If more neighbouring sentences (α>3) are considered for ordering then the results are not good since sentences which are far from a given sentence may not contain concepts that support or relevant to the sentence that is consider for ordering. Also they may convey more diverging information which will affect the ordering in an adverse manner. Ordering with one or two neighbouring sentences is better than three or four neighbouring sentences.

One sample output summary of 400 words with and without ordering with different α value is given below.

Summary without ordering
It is much cleaner, the service is faster, the interior is nicer, and it is not too expensive. The Belgrade media have suggested that the success of McDonalds in Yugoslavia depends on its acceptance by citizens long accustomed to a hamburger like fast food dish called the Pljeskavica ground pork and onions on a bun. The Big Mac meal consisting of a hamburger soft drink and french fries costs the equivalent of 257 or about as much the similar meal would cost in numerous Pljeskavica joints around town. SadikSeljami a waiter in a small Pljeskavica outlet just a few hundred yards from the McDonalds suggested that the American restaurant wants to drive Yugoslav fast food outlets out of business. Glen Cook an executive of the McDonalds Corp said during the opening ceremonies "We are very excited about the opening of this restaurant not only because it is the first one in a communist country but also because it is one of the nicest in Europe McDonalds and Genex contribute 1 million each for the flagship restaurant". The next East European McDonalds and the first in a Soviet bloc country is to open next month in Budapest Hungary. The crush of customers was so intense the company stayed open until midnight two hours later than planned. I'm taking it back for the girls at the factory to try Big Macs were priced at 375 rubles and double cheeseburgers at 3 rubles about two hours pay for a starting McDonalds staffer or the average Soviet but much cheaper than other private restaurants that have sprung up recently. Under the sign of the golden arches accented by the Soviet hammer and sickle flag hundreds lined up for the long awaited grand opening at 10 a.m. on Pushkin Square reaching out excitedly for McDonalds flags and pins as the hamburger chains army fulfilled the Soviet penchant for souvenirs with Western logos. The 500seat McDonalds restaurant in a three story building is operated by McDonalds Restaurant. Shenzhen Ltd a wholly owned subsidiary of McDonalds Hong Kong. It is managed by a Chinese national Chen Tikang and his son Chen Yin who is the restaurant manager. McDonalds proven determination to be here for the long term and to serve Russians in their own currency as opposed to the dollars charged by most other foreign joint ventures are just a couple of reasons for Russian gratitude. Seven years after the U.S. hamburger giant first tried to bring its Big Macs to South Korea the golden arches were finally going up.

Ordering with α =0
Under the sign of the golden arches accented by the Soviet hammer and sickle flag hundreds lined up for the long awaited grand opening at 10 a.m. on Pushkin Square reaching out excitedly for McDonalds flags and pins as the hamburger chains army fulfilled the Soviet penchant for souvenirs with Western logos. I'm taking it back for the girls at the factory to try Big Macs were priced at 375 rubles and double cheeseburgers at 3 rubles about two hours pay for a starting McDonalds staffer or the average Soviet but much cheaper than other private restaurants that have sprung up recently. The next East European McDonalds and the first in a Soviet bloc country is to open next month in Budapest Hungary It is much cleaner, the service is faster, the interior is nicer and it is not too expensive. The Belgrade media have suggested that the success of McDonalds in Yugoslavia depends on its acceptance by citizens long accustomed to a hamburger like fast food dish called the Pljeskavica ground pork and onions on a bun. It is managed by a Chinese national Chen Tikang and his son Chen Yin who is the restaurant manager. The 500seat McDonalds restaurant in a three story building is operated by McDonalds Restaurant Shenzhen Ltd a wholly owned subsidiary of McDonalds Hong Kong. Glen Cook an executive of the McDonalds Corp said during the opening ceremonies We are very excited about the opening of this restaurant not only because it is the first one in a communist country but also because it is one of the nicest in Europe McDonalds and Genex contribute 1 million each for the flagship restaurant. SadikSeljami a waiter in a small Pljeskavica outlet just a few hundred yards from the McDonalds suggested that the American restaurant wants to drive Yugoslav fast food outlets out of business. The Big Mac meal consisting of a hamburger soft drink and french fries costs the equivalent of 257 or about as much the similar meal would cost in numerous Pljeskavica joints around town. Seven years after the U.S. hamburger giant first tried to bring its Big Macs to South Korea the golden arches were finally going up . The crush of customers was so intense the company stayed open until midnight two hours later than planned. McDonalds proven determination to be here for the long term and to serve Russians in their own currency as opposed to the dollars charged by most other foreign joint ventures are just a couple of reasons for Russian gratitude.

Ordering with α = 1
Under the sign of the golden arches accented by the Soviet hammer and sickle flag hundreds lined up for the long awaited grand opening at 10 a.m. on Pushkin Square reaching out excitedly for McDonalds flags and pins as the hamburger chains army fulfilled the Soviet penchant for souvenirs with Western logos. I'm taking it back for the girls at the factory to try Big Macs were priced at 375 rubles and double cheeseburgers at 3 rubles about two hours pay for a starting McDonalds staffer or the average Soviet but much cheaper than other private restaurants that have sprung up recently. It is much cleaner the service is faster the interior is nicer and it is not too expensive. The Belgrade media have suggested that the success of McDonalds in Yugoslavia depends on its acceptance by citizens long accustomed to a hamburger like fast food dish

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It is managed by a Chinese national Chen Tikang and his son Chen Yin who is the restaurant manager.
The 500seat McDonalds restaurant in a three story building is operated by McDonalds Restaurant Shenzhen Ltd a wholly owned subsidiary of McDonalds Hong Kong.
McDonalds proven determination to be here for the long term and to serve Russians in their own currency as opposed to the dollars charged by most other foreign joint ventures are just a couple of reasons for Russian gratitude.
Glen Cook an executive of the McDonalds Corp said during the opening ceremonies "We are very excited about the opening of this restaurant not only because it is the first one in a communist country but also because it is one of the nicest in Europe McDonalds and Genex contribute 1 million each for the flagship restaurant".
The next East European McDonalds and the first in a Soviet bloc country is to open next month in Budapest Hungary.
The crush of customers was so intense the company stayed open until midnight two hours later than planned.
The Big Mac meal consisting of a hamburger soft drink and french fries costs the equivalent of 257 or about as much the similar meal would cost in numerous Pljeskavica joints around town.
SadikSeljami a waiter in a small Pljeskavica outlet just a few hundred yards from the McDonalds suggested that the American restaurant wants to drive Yugoslav fast food outlets out of business.
Seven years after the U.S. hamburger giant first tried to bring its Big Macs to South Korea the golden arches were finally going up.

Ordering with α =2

Under the sign of the golden arches accented by the Soviet hammer and sickle flag hundreds lined up for the long awaited grand opening at 10 a.m. on Pushkin Square reaching out excitedly for McDonalds flags and pins as the hamburger chains army fulfilled the Soviet penchant for souvenirs with Western logos.
I'm taking it back for the girls at the factory to try Big Macs were priced at 375 rubles and double cheeseburgers at 3 rubles about two hours pay for a starting McDonalds staffer or the average Soviet but much cheaper than other private restaurants that have sprung up recently.
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Seven years after the U.S. hamburger giant first tried to bring its Big Macs to South Korea the golden arches were finally going up.

Ordering with α =3

Under the sign of the golden arches accented by the Soviet hammer and sickle flag hundreds lined up for the long awaited grand opening at 10 a.m. on Pushkin Square reaching out excitedly for McDonalds flags and pins as the hamburger chains army fulfilled the Soviet penchant for souvenirs with Western logos.
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The crush of customers was so intense the company stayed open until midnight two hours later than planned.
It is much cleaner, the service is faster, the interior is nicer and it is not too expensive. The Belgrade media have suggested that the success of McDonalds in Yugoslavia depends on its acceptance by citizens long accustomed to a hamburger like fast food dish called the Pljeskavica ground pork and onions on a bun.

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From the above sample summaries it is evident that readability of the summary is very good for α = 2 or α = 1. For other values of α cohesiveness between the sentences can't be maintained, but the readability is better than unordered summary.

5. CONCLUSION

In this paper, we developed a sentence ordering system to order the sentences in the extractive summary. Extractive summary generated from the DUC 2002 data set by considering summaries with different size and by taking α number of sentences where α varies from 1 to 4 are evaluated by human experts. We are not getting good ordering for summaries where there are sentences that contain some year related information. The result can be improved further by detecting the sentences that contain year information and giving priorities for these sentences during ordering and remaining sentences in the summary can be arranged based on that sentence by considering both preceding and succeeding neighbouring sentences.

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