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Text Summarization Formed by Ranking Sentence from Key Phrase Extraction

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ABSTRACT: Text Summarization involves reducing large amount of text into smaller in size. So that we can get information about what kind of the data are present in that document. We can get more correct amount of information of the large text or document. Now days, various techniques are available to obtain the summary from the document or large text. In this, we represent the technique that help you to get summary of the document. This technique based on the ranking the sentence from key phrase extraction algorithm.

KEYWORDS: Ranking, Key phrase, text summary, Data mining algorithm.

I. INTRODUCTION

Now a day's tremendous amount of the data available everywhere in the form of wiki website, large text, documents and internet. So that to read that much amount of the data is the time consuming. Text summarization helps us to summarize that data into in the form of abstraction so that we can get exact and generic and more specific amount of information of that document or internet website or large text. According toMichelangeloCecia ,CorradoLogliscia , LucreziaMacchia[1] , they stated thatsummary of the document image is obtain using keyphrase extraction algorithm.
According to Jackson, P., they stated that summary can be obtained in the form of extracts, they are formed by extracting the key phrases of the original text or document and abstracts of the document. When they are formed by concluding the meaning of the original document or by re-generating the content of original document.[2]
According toSparck Jones K., They stated that summary can be obtained by more extractive way like selectingmore salient sentences through Machine Learning or Data Mining algorithms. So that we can obtained the summary of the original document by more effective way. According to PaiceC.D[3]. , they stated that sentences are mentioned in the form of lexical and structural features (e.g., keywords frequency, title keywords, sentence location, indicator phrases, etc.) and described or represented by as vectors of quantitative and categorical measures of those features (attribute-value representation) in the original document. And Zhuli, X., Li X., Barbara, D.E., Peter, N., Weimin, X., Thomas T[4] , they mentioned that the summary of the document is also obtained by Several supervised learning techniques which are the part of the Data Mining algorithms. To rank new sentences of the original document final ranking sentence function is used. Svore et al.[9] stated that resort to a neural network pair to generate a ranking composed of three sentences is also used to developed summary of the original document.

II. RELATED WORK

In based paper they use WISDOM++ tool for the transform the document image into XML format of that image. This Process complete into 6 steps. The document image is then divide into several part which shows coherent components or imp part of the document.

Ranking the sentence is based on the extracted based technique which leads to supervised data mining algorithm in data mining. To learn the ranking the model data mining algorithms is used. Several supervised learning techniques is found in the data mining algorithmand these are used to generate the ranking functions. We can generate the ranking functions using neural network pair [10].

III. PROPOSED ALGORITHM

1. Sentence Ranking for Summary:
Learning a preference model that leads to identify preference relations

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to be applied to new documents is used to solved the problem of calculating summary of the Document Text or URLs.

1.1 Mining Preference relations:

The problem of mining preference relations between sentences can be obtained as follows.
Given:
• A database schema *S* with *h* relational tables *S* = {*T*1, *T*2, . . . ,*Th*}
• Two sets *PK* and *FK* of primary and foreign key constrains on tables in S
• A target relation *T* ∈Srepresenting sentences that play the role of reference objects
• A precedence relation *PT* ∈Swith two attributes. Each tuple in this table represents an ordered pair of referenceobjects where the first reference object precedes the second one.
Find: A probability estimation *P* (*a* <*b*|*a*, *b*) for any couple of sentences *a* and *b* which are present to a new documentrepresented according to the schema *S* − *PT*. Objects in *S* − {*T*, *PT*} play the role of task relevant objects, while the
Precedence relation implicitly defines a partial ordering between two sentences.
In our approach, it is also possible to avoid to considersome sentences belonging to parts of the document that are not considered relevant for the task at hand (e.g. sentencesin tables or sentences in references of a original paper). This means that the preference relation in training data doesnot necessarily express total ordering of sentences in training documents.
By applying the Bayes theorem, *P*(*a* <*b*|*a*, *b*) can be computed as:
P(*a* <*b*|*a*, *b*) = *P*(*a* <*b*)*P*(*a*, *b*|*a*<*b*)/*P*(*a*, *b*) ……(1)

where:
• *P*(*a* <*b*) in (1) denotes the prior probability that a sentence precedes another. This probability might be differentfrom 0.5.
• *P*(*a*, *b*) = *P*(*a* <*b*)*P*(*a*, *b*|*a*<*b*) + *P*(*b* <*a*)*P*(*a*, *b*|*b*<*a*).

1.2. Patterns construction:

The relational pattern discovery is obtained by exploring level-by-level the lattice of relational patterns orderedaccording to a generality relation (>=) between patterns. Given two patterns *P*1 and *P*2, *P*1(>=)*P*2 showsthat *P*1 (*P*2) is more general (specific) than *P*2 (*P*1). Hence, the search gives us the most general pattern for the summary anditeratively alternates the candidate generation and candidate evaluation phases to obtain the summary. In14, the authors mention an enhanced version of the level-wise method15 to discover patterns from data in multiple tables of a relationaldatabase for the calculating the summary of the document. The space of linked relational patterns are searched by candidate patterns, which is constructed according tothe θ-subsumption generality order16.

This shows possible to obtain a levelwise exploration of the lattice of relational patterns ordered by θ-subsumption. Specifically, patterns are obtained by forming the pattern space one level at a time starting from the most specific
Pattern (the pattern have only the *preference*/2 predicate) and then by applying a breadth-first evaluation inthe relational patterns ordered according to >=θ.

1.3 Ranking Reconstruction

The main goal of this step is to produce ranking the sentences the sentences for the construction of the summary of the original document.
For the ranking the sentence for construction of the summary following algorithm are used:

Algorithm 1 ranking identification algorithm:
1: findranking (*G* = [*V*, *E*]): Ranking L
2: L← **Θ**;
3: while (#*L*<>#*V*) do
4: *L.add*(arg max((*bi*∈ *V*/*L*)*SUMPREFG*(*bi*));
5: end while

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Where,

- $G = \{V, E\}$ be a *labeled* directed graph where $V = \{b \in T\}$ and $E = \{(a, b, w(a,b) \in V^*V\times[0, 1] | w(a,b) = P(a <b|a, b)\}$ is the set of weighted edges of the graph where weights are the probabilities $P(a <b|a, b)$ computed according to equation (1),
- $SUMPREFG:V \rightarrow [0, \#V]$.

This Algorithm works on the method for the ranking identification. If the *SUMPREFG* ( ) of the sentence is high then that sentence is added to the summary of the document text. Once this implementation of the algorithm is done then that 'n' sentences is obtained from the algorithm is added to the Summary of the original document.

1.4. Data extraction and representation

Extraction of the key phrases from the document involves tokenization, sentence splitting, part-of-speech (POS) tagging, stop-word removing and stemming.

The representation ofthe sentences form by the ranking the key phrases extracted by extraction algorithm is done by means of a phase of natural language processing.

IV. SIMULATION RESULTS

Comparison based Confusion Matrix

	System Yes	System No
Manual yes		
Manual No		

Accuracy: (TP + TN)/Total

Misclassification Rate: (FP + FN)/ Total

True Positive Rate: TP/ actual yes

False positive Rate: FP/actual no

Specificity : TN/actual no

Precision : TP/ predicated yes

Prevalence : actual yes/ total

Where:

TP = True Positive

TN = True Negatives

FP = False Positives

FN = False Negatives

For Link1

	System Yes	System No
Manual Yes	2	3
Manual No	3	2

Table 4.1 Link 1

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For Link2

	System Yes	System No
Manual Yes	4	0
Manual No	4	2

Table 4.2 Link 2

For Link3

	System Yes	System No
Manual Yes	4	1
Manual No	1	4

Table 4.3 Link 3

For Link4

	System Yes	System No
Manual Yes	3	1
Manual No	2	4

Table 4.4 Link 4

For link6

	System Yes	System No
Manual Yes	3	0
Manual No	2	3

Table 4.5 Link 6

For Link7

	System Yes	System No
Manual Yes	0	5
Manual No	5	0

Table 4.6 Link 7

For link8

	System Yes	System No
Manual Yes	1	4
Manual No	3	2

Table 4.7 Link 8

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For link 9

	System Yes	System No
Manual Yes	3	2
Manual No	3	2

Table 4.8 Link 9

For link10

	System Yes	System No
Manual Yes	2	2
Manual No	4	2

Table 4.9 Link 10

For Link11

	System Yes	System No
Manual Yes	2	3
Manual No	3	2

Table 4.10 Link 11

For WordFile 1

	System Yes	System No
Manual Yes	3	1
Manual No	2	4

Table 4.11 WordFile1

For WordFile 2

	System Yes	System No
Manual Yes	3	2
Manual No	2	3

Table 4.12 WordFile2

For WordFile 3

	System Yes	System No
Manual Yes	4	0
Manual No	4	2

Table 4.13 WordFile3

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For WordFile 4

	System Yes	System No
Manual Yes	4	1
Manual No	1	4

Table 4.14 WordFile4

For WordFile 5

	System Yes	System No
Manual Yes	3	1
Manual No	2	4

Table 4.15 WordFile5

4.3 Performance Evaluation Table:

	Accuracy	M.Rate	True positive rate	False positive rate	Specificity	Precision	Prevalence
Link1	0.4	0.6	0.4	0.6	0.4	0.4	0.5
Link2	0.6	0.4	1	0	0.33	1	0.4
Link3	0.8	0.2	0.8	0.2	0.8	0.8	0.5
Link4	0.7	0.3	0.75	0.66	0.33	0.6	0.4
Link6	0.8	0.2	1	0.4	0.6	0.6	0.5
Link7	0.5	0.5	0	1	0	0	0
Link8	0.3	0.7	0.25	0.6	0.4	0.25	0.5
Link9	0.5	0.5	0.6	0.6	0.4	0.5	0.5
Link10	0.4	0.6	1	0.6	0.3	0.5	0.4
Link11	0.4	0.6	0.6	0.6	0.4	0.6	0.5
WordFile1	0.7	0.3	0.75	0.3	0.7	0.6	0.4
WordFile2	0.6	0.4	0.75	0.3	0.7	0.6	0.5
WordFile3	0.6	0.4	1	0.3	0.7	0.3	0.4
WordFile4	0.8	0.2	0.8	0.2	0.8	0.8	0.5
WordFile5	0.7	0.3	0.75	0.3	0.7	0.6	0.5

Accuracy of all 15 Documents:

((Sum of Accuracy of Docs)/15)*100

= ((8.8)/15)*100

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= 59%

Misclassification Rate of all Documents:

((Sum of all M. Rate of Docs)/15)*100

= ((6.2)/15)*100

= 41%

V. CONCLUSION

In this paper, we purpose the how to obtained the summary from large amount data or large document or URLS. For this we use sentence ranking algorithm to form summary of the original document using the key phrases. Key Phrases for ranking sentences is obtained by key phrases extraction algorithm using relational data mining algorithm or tools.

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