COMPUTATION LINGUISTIC: ONLINE SUBJECTIVE EXAMINATION MODELING

ASMITA DHOKRAT[1], GITE H.R.[2] AND MAHENDER C.N.[3]

Department of Computer Science and Information Technology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, MS, India.
*Corresponding Author: Email- [1]asmita.dhokrat@gmail.com, [2]hanumantgite@yahoo.com, [3]nam.mah@gmail.com

Abstract- Computational linguistic helps in understanding the meaning of sentence given by an individual as per situation. Our work of Descriptive examination comes under experiential cognition as we are modeling & finding correct meaning of answer given by any individual. In this paper we have explained how we used HMM to reduce the complexity of variation in answer and shown knowledge representational method for representing the answer. In our work even the context of the question is given a real importance & thus our representation has impact of Chomsky context sensitive grammar.
Key words- Computational linguistics, Question Answering System, Natural Language Processing, Information Retrieval, Web based learning.

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Introduction

Computational linguistics is an interdisciplinary field dealing with the statistical and /or rule-based modeling of natural language from a computational perspective [1].

Cognitive Linguistics is a new approach to the study of language which views linguistic knowledge as part of general cognition and thinking; linguistic behaviour is not separated from other general cognitive abilities which allow mental processes of reasoning, memory, attention or learning, but understood as an integral part of it.

The cognitive linguistic is divided into different parts i.e.

- The Experiential view
- The Prominence view
- The Attentional view of language.

Experiential view

The 'Experiential view' pursues a more practical and empirical description of meaning; instead of postulating logical rules and objective definitions based on theoretical considerations, this approach focuses on what might be going on in the minds of speakers when they produce and understand words and sentences.

Prominence View

The prominence principle explains why, when we look at an object in our environment, we single it out as a perceptually prominent figure standing out from the background. This principle can also be applied to the study of language, especially to the study of local relations

Attentional view

Finally, the 'Attentional view' assumes that what we actually express reflects those parts of an event which attract our attention.

Web based learning is often called online learning or e-learning because it includes online course content and the evaluation I also done online [6].

Question answering System

Question answering is a subfield of natural language processing, which itself is a specialized area of artificial intelligence. Question answering (QA) is the task of automatically answering a question posed in natural language. To find the answer to a question, a QA computer program may use either a pre-structured database or a collection of natural language documents. The general idea is to be able to answer questions written in English, by finding the answer in a collection of documents [5].

QA systems are classified in two main parts: Open domain QA system and closed domain QA system.

Open domain QA system

Open domain question answering deals with questions about nearly everything and can only rely on general ontology and world knowledge. On the other hand, these systems usually have much more data available from which to extract the answer [2].

Closed domain QA system

Closed-domain question answering deals with questions under a specific domain (for example medicine or weather forecasting and etc) and can be seen as an easier task because NLP systems can exploit domain-specific knowledge frequently formalized in ontology [4].

Online Examination System

Online examinations, sometimes referred as e-examinations, are the examinations conducted through the internet. Most of the examinations issue results as the candidate Online Examination helps the students for appearing the exam by online. Its mission is to offer a quick and easy way to appear the exam and it also provide the result immediately after the exam.

There are two types of online examination system i.e. Objective examination system and subjective examination system.

Subjective examination systems have lots of complexity like, different ways of answering for same question, some question required diagram or equation. Some question required answers more than one word. And as general practice question paper have following categories of question describe, explain, note on ,define, discuss so length even varies from individual to individuals.

Descriptive Question answering

Descriptive questions are questions which need answers that contain definitional information about the search term or describe some special events. Descriptive question are questions such as "Who is Columbus?", "What is tsunami?", or "Why is blood red?", which need answer that contain the definitional information about the search term, explain some special phenomenon.(i.e. chemical reaction) or describe some particular events[7].

For above all questions we need the answer that gives us a correct and brief introduction. For this brief answers we need system like these. On internet lots of information is available but sometimes it is not relevant to our question that time we need such systems which understand our problem and easily gives us the better answer. Our system plays this important role [7].

In our work we are solving complexity involved in assessing online descriptive examination using question answer method and applying HMM for representation.

Model Analysis

In our proposed work we follow the following stages as a base or the core for building the architecture of our system.

- Firstly we prepared a tutorial based on ready references which will be given to student as a reference material.
- Then on the basis of the tutorial a sample question paper is prepared.
- For this sample question paper a key is prepared by the expert in that subject.
- The question paper will generally have following types of question.
  a. Definition and example based
  b. Explanation and example-based
  c. One Compulsory question based on analogy i.e. they have to answer the question in their own words.

All these steps done by the faculty or expert members, then these set of tutorial and question set we hand over to the different candidate for answering because in our research we are trying to match the answer according to our model answer or standard answer which is prepared by the expert members then we also calculate the way of answering of different candidate and the time they required to solve the particular question.

The question answering system is divided into two parts i.e. Question based answer and Situation based answering [4].

Experimental Work

For above experiment we choose one topic i.e. Operating System, we prepared tutorial with the help of ready references which are easily available on internet or web and also from the books of various authors.

In our system we also provide the tutorial to the user and on the basis of this tutorial question were prepared. User has to write the answers to the question online. After submitting the paper our system checks the answer to our model answer then display the result. The sample tutorial and Question paper is given in appendix A and B.

Here on the basis of model answer we judge the answers written by different candidate. Then we note down the way of answering of different candidate.

Then statical existence is found to each word, if word present give 1's else 0. To describe that answer we follow the ones in the graph, and if the states leads to an accepting or final state that means the answer is correct. Figure 1 shows model diagram for a sample answer representation in our work.

For Example

Que: What is main objective of real-time Operating System?
Ans: Quick and predictable response to events.

So we note down the different answers from different candidate, then we divide that answer statically i.e.

Quick [1] predictable [1] response [1] to events [1]
C1: Quick and predictable response to events. [1 1 1 1]
C2: Quick and predictable response to events. [1 1 1 1]
C3: Quick and predictable response to events. [1 1 0 1]
   (Comment: 0 is spelling mistake)

C4: Quick and predictable response to events. [1 1 1 1]
C5: Quick and predictable response to events. [1 1 1 1]
C6: Quick and predictable response to events. [1 1 0 1]
  (Comment: 0 is spelling mistake)
C7: Quick and predictable response to events. [1 1 1 1]
C8: Quick and predictable response to events. [1 1 1 1]
C9: Quick and predictable response to events. [1 1 1 1]
C10: Quick and predictable response to events. [1 1 1 1]
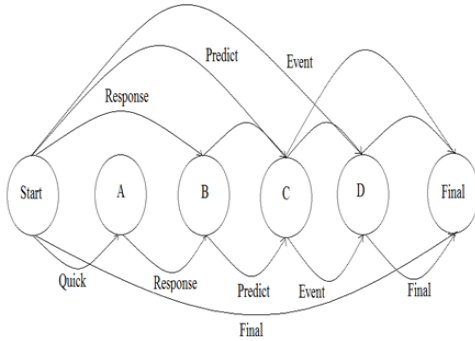
Fig. 1- Shows some alternative path for same question by different candidates.

Conclusion and Future Work

Web based learning is often called online learning or e-learning because it includes online course content. Question answering is a subfield of natural language processing, which itself is a specialized area of artificial intelligence. Here we have created few theoretical models for extracting clause in the answer.

Our work is on online subjective examination which has lot of complexity due to vocabulary, understanding of concept, individual way of writing, which adds to the variance in style wording and length of answer. To take care this issues we have propose method which consider multiple answer to the same question using HMM and final marks depends upon the states which has the match to the model answer ends with a path in accepting (final state) in our work we have not considered answer with diagram, equations.

Context sensitive grammer is used to set the grammer of our answer, followed by HMM to represent the answer, where we are able to represent many ways of answering the same question that has helped us in making a schematic structure for creating marking scheme.

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Appendix A- Tutorial

Appendix B- Question paper