Subjective Answer Evaluation System

Lalit Agrawal, Vikas Mhalunge, Bhavesh Pitale, Kishor Bahir

Department of Computer Engineering, PVPPCOE, Mumbai, Maharashtra, India

ABSTRACT

Every year many students apply for various examinations which include competitive, institutional, non-institutional. Competitive exams mostly have objective or multiple choice questions. As these exams are conducted on machines, their evaluation is easy and therefore is done on machines. However it has been observed that these examinations cater only objective or multiple choice questions and provision to subjective answer and its evaluation is still an open problem. Automation of descriptive answer evaluation process will be helpful for various universities and academic institutions to efficiently handle the assessment of exam answer sheets of students.

Keywords : Computer, Assessment, Descriptive, Processing, Evaluating, Grammar, Database, Extraction.

I. INTRODUCTION

Examinations have always been part of every educational, non-educational organization. Examinations can be either descriptive or objective or both. Every examination needs evaluation. Most of the competitive examinations are objective in nature. They are conducted on machines and evaluated on the same. This system or any other such systems are more advantageous in terms of saving resources. However it has observed that these systems contain only multiple choice questions and there is no provision to extend these systems to subjective questions.

There are a few problems due to which these systems cannot be used in board examinations, university examinations where student writes subjective answers so there is a need for a software system which will help in reducing the usage of resources. For countries like India, ever-growing population and poor infrastructure hampers quality education system. It can be imagined that the amount of pressure that is held on education systems and teachers to evaluate the number of answer copies. However, going forward, India will need to be focus more on quality. As per the latest (2015-16) report issued by the All India Council of Technical Education (AICTE), there are almost more than 10330 institutions that offer education in India to more than 2 million students. The AICTE also reported 6432 engineering colleges in India with an annual student is capacity of over 3 million and more than 1.6 million actually enrol with just 578245 faculties. On an average every institute has 4 examinations per year so when calculated more than around 6.4 million answer sheets are generated.

Keeping in mind the number of faculties evaluating papers and assessing marks is a tedious job. Automating the process of evaluating the descriptive answers will not only reduce the usage of resources but also overcome the human limitations. It will also speed up the overall educational system as the students won't have to wait for a long time for the results.

II. METHODS AND MATERIAL

A. Proposed System

The proposed system is a system that seeks to implement an application which will be able to evaluate the subjective answer to a question. It will allot the marks according to the percentage of accuracy present in the answer. This system is a software system in which user will be authenticated by using user login. After the authentication, users will be provided with the questions.

Our proposed system is designed to evaluate answers for five users providing five different answers. The standard answer is stored in the database with the description meaning and keywords. Then it will

evaluate each answer by matching the keywords or the key concepts as well as its synonyms with the standard answer. It will also check the grammar and spellings of the words. After the evaluation, it will grade the answer depending on the correctness of the answer. The entire process consists of three main steps: keywords and synonyms extraction, matching of keywords and synonyms, weighting the keywords and generating score. This evaluation system will grade the answers depending upon the number of keywords matched.

All paragraphs must be indented. All paragraphs must be justified, i.e. both left-justified and right-justified.

A. Modules of Proposed Project

The system comprises of four modules and they are Login module, Information extraction module, Weighting module and Score Generation module.

B. Login Module

The login module authenticates both the user and the admin. Once the authentication is done, the user and admin can perform their individual activities.

1. Admin Login:

The admin needs to enter the username and the password for authentication. Once authenticated, the admin can now create the question and store the answer for the same in the database. The admin can also add students, subjects and tests for those subjects. The admin should keep all the keywords present in the answer in capital letters. Thus admin should store the answer with a subject expert helping him to identify the keywords present in the answer. The question will be displayed to the user and the answer stored will be used as the standard answer for comparing with the user's answer.

2. User Login:

The user login enables the user to write the answer for the question displayed. The user is asked to enter his login id and test id. If all the credentials are satisfied then the student is redirected to the page where the question and a text box for the answer is displayed. Once the user has completed writing the answer, he/she can submit the answer for evaluation.

INFORMATION EXTRACTION MODULE:

Information extraction module is a module where the process of extracting the keywords from the standard answer and the user submitted answer would take place.

Along with the keywords, the synonyms of the keywords submitted by the user will also be extracted. The keywords are the words that provide the key concept or are of great significance in a document. The keywords that get repeated very often in a document is given less importance. But the keywords which occur rarely in a document will have great importance. The synonyms of the keywords will be extracted from the dictionary stored in the database.

WEIGHTING MODULE: 1. Keywords The keywords of the model answer must be written in capital letters while storing in the database. These keywords are extracted by our system and stored in a multidimensional array. Now these words are checked in the student's answer and depending on the percentage of keywords present in the student's answer, marks will be given. First of all, the student's answer is broken down into strings and is stored in a multidimensional array. Now the keywords extracted by the system from the admin's answer are checked with the array of the student's answer one by one.

2. Grammar

Grammar is used to form the structure of a sentence. There is a possibility that the user may only write the keywords without the sentences. Thus checking grammar plays an important role in subjective answer evaluation. In order to secure maximum marks the user must specify the keywords along with the proper sentence formation. Grammatically incorrect sentences in the student's answer will be given less marks even if there are a lot of keywords. The library that is used for checking grammar is "After the Deadline".

3. Grammar checking involves the following:

a) Spelling errors: The student's answer is broken down into words and these words are checked in a dictionary which is inbuilt in After the Deadline library. Those words which are not present in the dictionary are matched with the words within the array of model
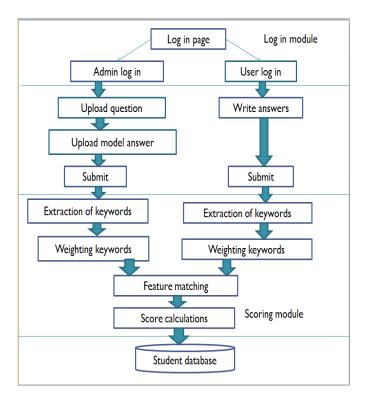
answer. If they are not present in either of them then they are considered as incorrect words.

b) Sentence formation: Only if the sentences are in the correct grammatical form marks for grammar are given.

3. Length Length of the answer is also important as the student may write the answer very shortly with all keywords and grammatically correct sentences. Such an answer would get all the marks for grammar and keywords but it will get less marks for the length.

Score Generation Module

The score or mark is generated depending on the above factors and the total marks will be sum of all the marks obtained from individual sections. Depending upon the priority, keywords are given 40% priority followed by grammar 30% and then synonyms 20% and finally the length of the answer 10%. The marks for length are dependent on the percentage of keywords matching and a marking scheme is tabulated for giving marks to the length. Thus if the student writes a completely different answer with no keywords matching, then marks for length won't be allotted.

Keywords matched in Percentage	Marks obtained out of Max marks for Length & Grammar
80-100	100% of Max marks
60-80	90% of Max marks
40-60	80% of Max marks
20-40	50% of Max marks
5-20	30% of Max marks
1-5	10% of Max marks
0	0% of Max marks

III. CONCLUSION

Examinations play a very important role in colleges, universities and various other educational institutes. Many educational institutes have their examinations conducted online. However, these exams only contain multiple-choice questions, which are proving to be very efficient in testing the student's aptitude, on the other hand fail to measure the conceptual knowledge a student or learner must possess. Therefore subjective answers must be included in online examinations. The proposed system attempts to evaluate the subjective answers. The proposed system evaluates the answer based on the keywords. By comparing the standard answer and the student's answer marks are obtained to the student. Maximum marks are obtained if the student utilizes all the keywords mentioned in the standard answer. Hence the said system could be of great utility to the educators whenever they need to take a quick test for revision purpose, as it saves them the trouble of evaluating the a bundle of papers. Also this system totally evacuates any circumstance of business .In future we are planning to evaluate subjective answers with diagrams and mathematical expressions. The current system only evaluates answers written in English. Further it can be extended to evaluate answers written in other languages also.

IV. REFERENCES

[1]. "Ontology Based Algorithm And Life Cycle For Subjective Answer Assessment System" International Journal of Advance Research In Science And Engineering, IJARSE, Vol. No.4, Special Issue (01), March 2015

[2]. Sheeba Praveen, "An Approach to Evaluate Subjective Questions for Online Examination System" published in International Journal of Innovative Research in Computer and Communication Engineering. Vol. 2, Issue 11, November 2014

[3]. M. Syamala Devi and Himani, "Subjective Evaluation using LSA Technique" Published in International Journal of Computers and Distributed Systems, Issue 10, December2014

[4]. Ani Thomas, M.K.Kowar& Sanjay Sharma, "Intelligent Fuzzy Decision Making for Subjective Answer Evaluation using Utility" published by Emerging Trends in Engineering and Technology, 2008. ICETET '08. First International Conference on Date 16-18 July 2008

[5]. A. Guruji, Mrunal M. Pagnis , Sayali M. Pawar and Prakash J. Kulkarni, "Evaluation of subjective answers using GLSA enhanced with contextual synonymy "Published in International Journal on Natural Language Computing (IJNLC) Vol. 4, No.1, February 2015

[6]. "Algorithm for Automatic Evaluation of Single Sentence Descriptive Answer" International Journal of Inventive Engineering and Sciences (IJIES) ISSN: 2319–9598, Volume-1, Issue-9, August 2013

[7]. Ani Thomas, M.K.Kowar, Sanjay Sharma, "Intelligent Fuzzy Decision Making for Subjective Answer Evaluation using Utility", Emerging Trends in Engineering and Technology, 2008.ICETET '08. First International Conference on Date 16-18 July 2008