Subjective Answer Evaluation System

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Abstract:
Every year many examinations are conducted like competitive, intuitional, non institutional which students apply for. Competitive and entrance exams typically contain objective or multiple choice questions. These exams are evaluated on machine as they conducted on machine and therefore their evaluation is easy. However as these exams accommodate only objective or multiple choice questions the ability to answer descriptive question is still not provided and evaluation of the same. It will be very helpful for educational institutions if the process of evaluation of descriptive answers is automated to capably assess student's exam answer sheets.

Keywords: computer, assessment, descriptive, processing, evaluating, grammar, database, extraction.

I.   INTRODUCTION

Usually all educational, non educational organizations conduct examinations. The questions asked in the examinations can be either descriptive or objective or both. Once the answers are submitted they need evaluation. Competitive examinations usually consist of objective or multiple choice questions. These are evaluated on machines itself. This technique or is very beneficial in terms of reducing usage of resources. Although this approach can only be implemented on objective questions and hence descriptive answer cannot be evaluated. These systems cannot be used in university examinations, board examinations where subjective answers are written by students so there is a necessity for an approach which will reduce the usage of resources. In India, the quality of education system is severely hampered due to ever-growing population and poor infrastructure. The amount of pressure education systems and teachers hold is imaginable as the number of answer sheets to evaluate is huge. the latest (2015-16) report by the All India Council of Technical Education (AICTE)[1] states that, there are approximately more than 10330 institutions offering education in India to about more than 2 million students. The AICTE reports[1] also states that there are 6432 engineering colleges in India with a yearly student intake capacity of over 3 million and more than 1.6 million truly enroll with only 578245 faculties. Typically every institute has 4 examinations every year; so on calculating 6.4 million answer sheets are generated.

II.   PROPOSED SYSTEM

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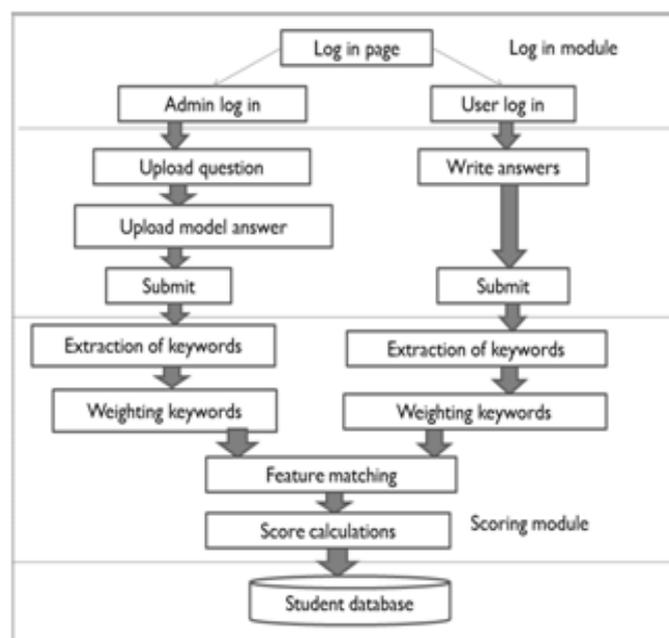
Modules of Proposed Project:

Figure.1.Flow of System

III.   METHODOLOGY

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

A.   LOGIN MODULE
The login module is used to authenticate the user and the admin. Once the both the user and the admin are authenticated, they may proceed with their individual activities.

1. Admin Login: The admin is authenticated using his user id and password. Once authentication is done, the admin can add

questions and their respective answers in the database. The admin can also add subjects, students and tests for those students. The admin needs to keep all the keywords from the answer in capital letters. Thus admin first needs to identify the keywords present in the answer. The question will be displayed to the students and the answer stored in the database will be used as the model answer for comparison with the user's answer.

2. User Login:

The user logs in with the user id and the test id as the password. 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. The user can then write the answer for the question displayed. After completing the answer, he or she can submit the answer for evaluation.

B.   INFORMATION EXTRACTION MODULE:

Information extraction module is a module where the keywords are extracted from the model answer and the answer submitted by the user would take place. The keywords provide the key concept to the answer or are of great importance in the answer. The keywords that are repeated very often in the answer are given less value. But the keywords which appear infrequently in the answer will have great importance.

C.   WEIGHTING MODULE:

1.   Keywords :

The keywords from the standard answer have to be written in capital letters while storing in the database. These keywords from the standard answer are stored in a multidimensional array. Firstly, the answer written by the student is broken down into strings and is stored in a multidimensional array. After this the keywords from the model answer are compared with the student's answer array one by one. The keywords are checked in the student's answer and depending upon the keywords present in the student's answer, marks are allocated.

Table.1.Keywords based Marking Scheme

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

2.   Grammar

The structure of the sentence is formed by using Grammar. The user may only write the keywords and nothing else. Hence checking whether the answer is grammatically correct or not, is important in subjective answer evaluation. To secure highest marks the student must include the keywords in proper sentence formation. Even if there are a lot of keywords, grammatically incorrect sentences will be given less marks in the student's answer. "After the Deadline" is the library used for checking grammar.

Grammar checking involves the following:
a) Spelling errors:
The student's answer is segregated into words and then these words are checked in the dictionary which is present in After the Deadline library. The words which are absent in the dictionary are then compared with the words which are present in the array of model answer. If those words are not present in either of them then they are considered as wrong words.

b) Sentence formation:
Only if the sentences are grammatically correct then only marks for grammar are given.

3.   Length:
Length of the answer is also an important factor as the student may write all keywords and grammatically correct short sentences . Such answer would get full marks for keywords and grammar but less marks for short length.

D.   SCORE GENERATION MODULE:
The final score for the student's answer is obtained by adding marks from individual sections which are keywords, grammar and length of the answer. Depending upon the significance, keywords have 50% priority after that grammar 25% and the length of the answer has 25%. The marks for length are reliant on the percentage of keywords matched. Hence if the student writes an answer with no keywords, then marks for length and grammar will also be deducted.

Table.2.Score Generation Criteria

Criteria	Percentage of marks allotted
Keywords	40
Length	20
Grammar	40=20+20
(a) Spelling	20
(b) Sentence Formation	20

IV.   CONCLUSION

In colleges, universities and various other educational institutes' examinations play a very vital role. Many educational institutes conduct online examinations. But, these exams only include multiple-choice questions, which are efficient in checking the student's aptitude skills, in contrast they fail to determine the theoretical knowledge a student possesses. Thus subjective answers must be incorporated in online examinations.   The proposed system attempts to calculate the subjective answers. The proposed system calculates the student's answer based on the keywords. By judging against the model answer and the student's answer marks are allocated to the student. Highest marks are gained if the student writes all the keywords declared in the model answer. Thus the proposed system could be of great effectiveness to the educational institutes, as it saves time and the trouble of checking bundles of papers. In future a system can be developed 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.

V. REFERENCES

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