

ARTIFICIAL INTELLIGENCE IN EDUCATION: A STUDY ON EVALUATING DESCRIPTIVE ANSWER SHEETS

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ABSTRACT

Automating the task of scoring descriptive answer is considered. Due to increasing number of courses and appearing students many hours of examiner and a lot of efforts are required for effective evaluation. Computer and technologies can be used to solve such complex problem. The goal is to evaluate and assign scores to descriptive answer which are comparable to those of human assigned score by coupling AI technologies. This process involves extraction and segmentation of words, removal of stop words, stemming. The scoring system is based on Machine Learning technology and Natural Language Processing. As a result the computer can assign score as good as human being.

KEYWORDS: Descriptive answer checking, Automatic evaluation, Artificial Intelligence.

1. INTRODUCTION

Online computerized test is popular in education system. In the field of Information Technology the online test for different competitive examination is gaining momentum. Such examinations are organized, evaluated and results are declared by computer system. Most of the cases the online test is based on only Multiple Choice Question (MCQ) but a lot of efforts and times of our valuable Professors and Examiners can be saved if a computer system is also able to check, evaluate and assign scores to descriptive answers like that of a human being. The research paper describes the usage of computer in educational system that includes developing a software which is capable of checking descriptive answers like that of a human being. The system consists of number of AI technologies like segmentation of words, stemming, removal of stop words and machine learning. Basically a model is constructed that will help student, teacher and a result of entire education system. At last the solution is concluded as a goal of developing descriptive answer checking system.

2. MATERIALS AND METHODS

The system consists of a web based platform with the following methods :-

- Examiner Registration
- Student Registration

After signing into his or her own account, the Examiner performs the following activities :

- Add question sets and their respective marks.
- Add solution answer for respective questions.

After signing into his or her own account, the Student performs the following activities :

- Select the exam he/she wants to appear.
- Answer the questions and submit for evaluation.

2.1 Methodology

On adding question sets by examiner, each question is run through a process consisting punctuation removal, stop word removal, stemming, synonyms generator and store the resulted keyword collection in respective database.

On submitting answer by student, each answer is run through a process of grammar checker and spelling checker and store the evaluated percentage for spelling and grammar. Then again run the answer String through process of punctuation removal, stop word removal, stemming and compare the resulted keyword collection with the previously stored keyword collection in database and store the evaluated matching percentage.

Now the evaluated percentages are submitted to a trained Machine Learning bot and the bot returns an evaluated score to be assign for the answer.

Training the ML bot : The ML bot is trained (Neural Networks Algorithm) with a given set of data consisting an answer given by examiner and a set of answers given by students along with the score assigned manually by the examiner so that the bot learn the pattern of assigning score based on the percentage match of spelling and grammar check as well as the keyword match percentage.

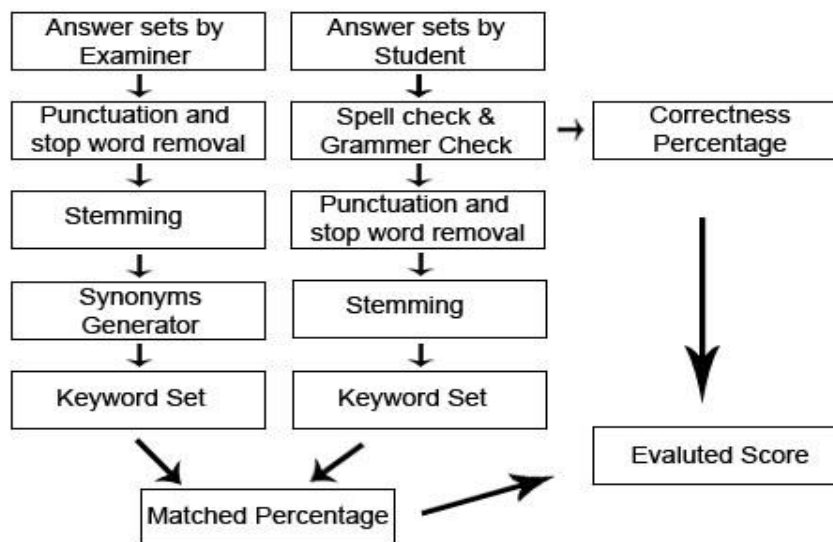


Fig. 1. Work flow of the system

3. RESULTS AND DISCUSSION

3.2 Algorithm

1. **Stop Word Removal:** It is the process for removing the non keyword words from a given String. It removes all the verbs and other non keyword words like am, is, are, were, the, a etc and filter the keywords.
2. **Stemming:** It is the process for removing the commoner morphological & In flexional ending from words in English. It is main use is as part of a term normalization process that is usually done when setting up information retrieval system. Stemming refers to the process of removing affixes (prefixes & suffixes) from words. In the information retrieval context, stemming is used to conflate word from to avoid mismatches that may undermine recall. As a simple example consider searching for a document entitled "How to write" if the user issues the query "writing " there will be no match with the title .however if the query is stemmed so that "writing "becomes "write" then retrieval will be successful. Stemming is the process of finding the root word.
3. **Synonyms generator:** It is process of generating all possible synonyms of a particular keyword that could probably be use by the student in their answer to define same meaning as the keyword of the examiner.
4. **Neural Networks Algorithm:** An algorithm to train a system with data consisting of a set of *training examples*, where each example is a *pair* consisting of an input and a desired output value (also called the *supervisory signal*, *labels*, etc).

4. CONCLUSION

In future online teaching learning method s will be widely used in many institutions. Descriptive answer checking methods will help to evaluate students answer. Our proposed method evaluate it more efficiently and accurately.

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