AUTOMATED QUESTION PAPER GENERATOR SYSTEM

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Problem Statement

To design an Automatic Question Paper Generator System which makes use of Bloom's Taxonomy to detect the standard of the question paper generated as well as generate it.

- Assessments or exams generally play an essential role in education and as well as in a student's life. It is considered as the primary indicator of students learning process.
- Bloom's Taxonomy cognitive model containing Knowledge, Comprehension, Application, Analysis, Evaluation and Synthesis is considered the best for classifying.
- This focuses on classifying the queries on which technical skills are used to equally cover the questions from all the domain levels in bloom's taxonomy.

Institutions can use our application with the help of which they can set standard question paper for conducting admission tests, as well as tutors/teachers. Test generator also can make use of this for assessments and Admission tests.

Background

- Few Inferences drawn can be - a set of rules categorize questions into distinct cognitive categories of Bloom's nomenclature.
- The rule-based approach makes use of nlp methods to recognize key verbs that aids in the classification of the given input question.
- Using nlp methods such as lemmatization, tagging, removal of stop words and tokenization are done before producing the rules that are used for categorization.

Project Requirement

Working PC with RAM > 8GB with Windows or Ubuntu OS.

- For single question Prediction, a user has to give input in the pdf format and as for Multiple Questions Prediction, the user has to input questions in the csv format. Another primary option available on the user interface is Generating Questions Paper, for which the inputs like question banks has to be in CSV format. The system must generate a high-quality Paper(pdf/word) as output.
- The user should be able to add percentages for levels and number of questions easily on the interface. The system must perform correct classification according to Bloom's taxonomy. Classification should be done properly even in the case of ambiguity.

Design Approach

- SVM classification was chosen as a primary step of classification.
- This is because verbs play an important role in this particular study and svm algorithm converts the words to vector and such that similar words have similar vector representation.
- This study needs questions that are labelled correctly according to bloom's taxonomy levels.
- SVM classifier is trained using the training data.
- Questions are tested with the classifier that is trained.
- The question may get categorized to multiple categories.
- So, the questions that got classified into multiple categories are made to go through a weighting algorithm which perfectly categorizes questions into only a single category.
- This test when compared to the actual result, gave us an accuracy of 68 percent.

Result and Discussions

- As for the SVM classifier alone, the accuracy found to be around 65-68% with multiple categories being predicted for each question.
- To solve this ambiguity, the primary classifier was blended with a weighting algorithm-based model classifier which reduced the prediction to exactly one.
- The hybrid model which is SVM combined with weighting technique performs better than other ML Algorithms which predict multiple classes.

Summary of Project Outcome

- For a user given question bank that has to be in the form of csv,a question paper is generated by taking the user percentages and number of questions as input.
- For single question prediction, the input is taken in pdf format and the expected bloom's category is given as output.
- For Multiple questions Prediction, input is taken in CSV format and the expected bloom's category is given as output.

Conclusion and Future Work

- The hybrid, as in SVM along with the weighting algorithm-based classifier performed better than SVM alone. This performs better and is also more dynamic than rule-based classifier that we tried to use during the first phase of the project.
- As for future work, collecting more keywords belonging to the six different learning levels as much as possible. Adding more rules to the second classifier can lead to the better model.

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