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Implementation of Automatic Quiz generator using NLTK

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Abstract

In this paper Automatic quiz generator system is proposed which will generate gap fill questions . This system allows the professor to select the content on which he/she would like to test the students. The framework then generates questions, which will be subjected to approval by the teacher. Schedule of the online quiz will then be notified to the concerned students. Students are provided with login and password to their respective accounts through which they can access the quiz and answer it. Responses will be recorded within the time slot, after which the correct answers will be displayed for self evaluation. The framework then evaluates the responses and records them. The overall performance of the student is reported after a series of such quizzes at the end of a logical session. The performance is analyzed individually as well as by comparing with class average using graphical representation.

1. INTRODUCTION

Traditionally, composing examination papers is done manually by using the writers' knowledge, experience and style. Despite the high credit of the questions, there are still some shortcomings. The main problem is a low quality of papers caused by some human factors such as instability and relatively narrow range of topics. Teachers need to spend a lot of time and energy in composing examination papers. This does nothing for the separation of teaching and testing. Therefore, with the use of computers, automatic generation of test papers is an important measure for achieving the separation of teaching.

Online smart quizzer is basically intended for educational institutions. The time involved in setting the question paper and evaluating it could be saved. Often the teacher refers to a source, usually a chapter from a text book in order to frame questions. Once the test is over the usual practice is to manually evaluate each answer by comparing it with a prescribed, predefined answer. The online smart quizzer intends to save the time and effort involved in doing this. Quizzes can be graded instantly reducing hours of paper work.

In this the teacher can upload a PDF of the related subject then the question generator generates fill the blank questions based on the PDF uploaded using NLTK [3] and [2]. Later the generated questions can be uploaded to a database which can be accessed by the student with the unique ID and password provided to them and takes the test within a particular time limit, students answer will be stored in database and is evaluated and the result is generated. This method reduces the time consumed

compared to old method where the teachers had to manually prepare the questions and also had to correct the answers manually which used to consume a lot of time by using this instant evaluation of the paper can be done and also the results are be stored in the database for future references.

Students can benefit greatly by taking simple online practice quizzes. It is possible to give them immediate response after taking the quiz. The online quiz program can focus on parts of the learning goal details that students might have overlooked. Students and teachers can see the student's progress over time as they see the online quiz scores. Random set of questions can be made available to each student avoiding malpractices .Statistics and learning pattern analysis after a series of quizzes makes the learning more interesting.

2. LITERATURE SURVEY

Traditionally, composing examination papers is done manually by using the writers' knowledge, experience and style. I.e. to conduct the examination, educator needs to generate the questions manually, educator should evaluate all the papers manually, and students need to wait for results which is very time consuming process and also there are high possibility of human error.

So researcher has decided to develop system through which, automatic questions can be generated, and time and efforts will be reduced. To develop automatic question generation, many researchers have presented their work and many algorithms are proposed to generate the automatic question from given file or text. Some of the works related to automatic examination by researcher are briefly shown below

Automatic Gap-fill Question Generation from Text Book was presented by Manish Agarwal and Prashanth Mannem 2011 .This system can generate gap-fill questions for content in a document. Gap-fill questions are fill-in-the-blank questions with multiple choices provided. The system finds the sentences from the document and generates gap-fill questions from them by first blanking keys from the sentences and then determining the distracters for these keys. Gap-fill questions are generated from it in three stages: sentence selection, key selection and distracter selection. Sentence selection involves identifying informative sentences in the document which can be used to generate a question. These sentences are then sent to key selection stage which will identify the key on which to ask the question. In the final stage, the distracters for the selected key are identified from the given chapter by searching for words with the same context as that of the key.

TEDDCLOG, a system developed by Simon smith who is used to generate gap fill questions for vocabulary learning. It is implemented using Sketch Engine which is leading corpus query system. It generates draft test items from corpus. It will take key (correct answer) as input. It will then find distracters (wrong answers) from the distributional thesaurus, and identifies a collocate of the key that does not occur with the distracters. Two Sketch Engine calls retrieve collocates and thesaurus items. It will work through the two lists, checking each pair in turn to see if they co-occur in the corpus. We continue until we find a collocate and three thesaurus entries that do not occur with it. Next it will find sentences containing both key and collocate. Then it will present sentence with distracters to instructor. Instructor can modify, select or reject the gap filling question formed.

Selection Strategy to Improve Cloze Question Quality, Juan Pino describes a baseline technique to generate cloze questions (gap-fill questions) which uses sample sentences from WordNet. Word Net is a lexical database

in which nouns, verbs, adjectives and adverbs are grouped in synonym sets, or synsets. Synsets have a semantic relationship such as synonym, antonym, and etc. Here after selecting the keyword from wordnet database, most suitable sentence will be selected from several sentence lists. That means for one word a sentence will be selected from several sentence list. Then the destructors (wrong answers) will be added along with the key to form options. He then refined this technique with linguistically motivated features to generate better questions. They used the Cambridge Advanced Learners Dictionary (CALD) which has several sample sentences for each sense of a word for stem selection (GFS).

Automatic Question Generation Using Software Agents by Shivank Pandey and K.C. Rajeswari. This system will take input in the form of text file which contains of the text upon which the user desires to fetch questions; the output is produced in form of a text file containing questions based on Bloom's taxonomy. Here initially document in processed section called DPA (Data processing Agent).Output of the DPA is then sent to next section where input will be classified on the basis of blooms taxonomy levels. Then it is processed by the Question Generation Module to the final stage of generating questions with the help of question templates from the database, the output is in the form of questions stored in a text file. The advantage of generating questions based on Blooms taxonomy enables to generate the questions that help to assess learning ability of the students

Automatic Question Paper Generation System using Randomization Algorithm by kapil naik [5], this system makes use of shuffling algorithm as randomization technique to generate automatic questions. In this system examiner initially needs to give subject on which question should be generated, difficulty level of questions, total number of questions as input. Based on the input Question paper generator module will fetch appropriate questions from question bank ,finally after selecting set of questions it will give output as question paper to examiner. This system takes intelligent decisions to eliminate repeated questions and checks even for the alternatives. It mainly deals with the gathering, sorting and administration of a large amount of questions about different levels of toughness from different subjects. This system introduces shuffling algorithm to generate questions, main part of the algorithm is to provide randomization technique in question paper generation system, thus different sets of question could be generated without repetition and duplication.

3. PROPOSED SYSTEM

3.1 Methodology

Web-based online examination system design and implementation [6], this system is based on client/server. Here all the examination procedure will be done online itself. All the examination questions given by examiner will be stored in a web database. Through the browser, students can access the examination system server request the appropriate subject papers online. Students need to complete the test in specified time. After specified time, session will end automatically. Answers will be stored web database and evaluation of the answers will be done automatically. Score of the test will shown to student .The main complexity of this system is that internet connection should be available. I.e. without internet student cannot take test.

This is web based examination system. In this system gap fill (fill in the blank) questions will be generated automatically by selecting a keyword using naive bayies classifier algorithm. This system will be using NLTK which is a framework in python language. MySQL and Wimp server is used for storing the details and mark of the students. Website will be built using php. Students or teacher can take or post test by accessing website through web browser. This system will contain two processes. They are Teacher uploading quiz and Student taking quiz.

Teacher Upload Quiz is the process for providing the quiz. It makes use of Question Generator module. The Question Generator module generates Question with the help of Upload File Module. The Upload File Module helps in uploading the files with the help of which question is generated. Then the Question Refinement Module refines the Questions with the help of the teacher. The Questions is updated to the Database and the Student notifier notifies the entire student registered for the course.

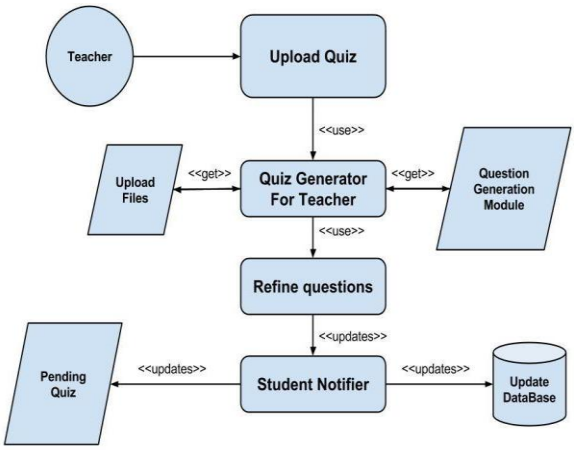

Fig 1: Process of uploading and generating Question

The Student Taking Quiz Process is the process for the student to take a quiz. It includes the Quiz Generator for the Student. The Quiz Generator for the student gets the Question from the Database and gives to the Randomizer. The Randomizer randomizes the questions and starts the Session for the Quiz. During the Quiz Anti-Cheat activity such as no alt tab and no right click works. After Session ends the Quiz Evaluator evaluates the Quiz and updates the Database.

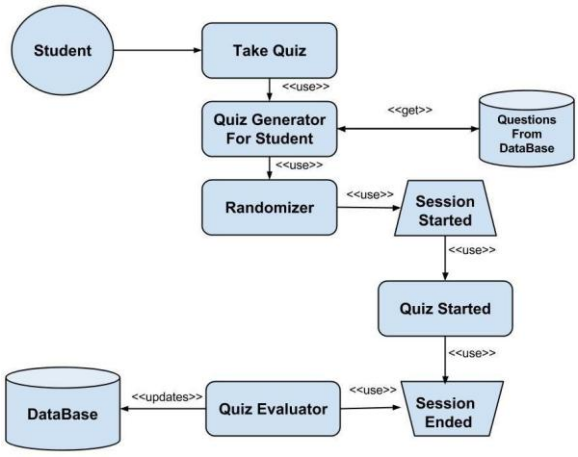

Fig 2: Process of taking the quiz and evaluating.

3.1.1 Architecture design

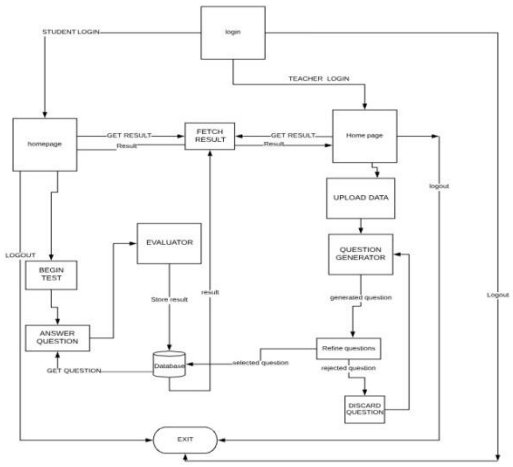

Fig 3: Architectural Design

The above diagram shows architecture design of automatic quiz generation system. Here User can login as either student or as teacher.

If he logins as teacher he will in itially move to home page from there he upload file to question generator process where questions will be generated. These generated questions will be refined in refine question process. Rejected question will be discarded else will be stored in database.

If he logins as student he will be initially placed in home page, from there he can move to begin test process where he will start answering the test question which are fetched from database. Finally after completing process answers will be stored in database.

3.1.2 Modular Design

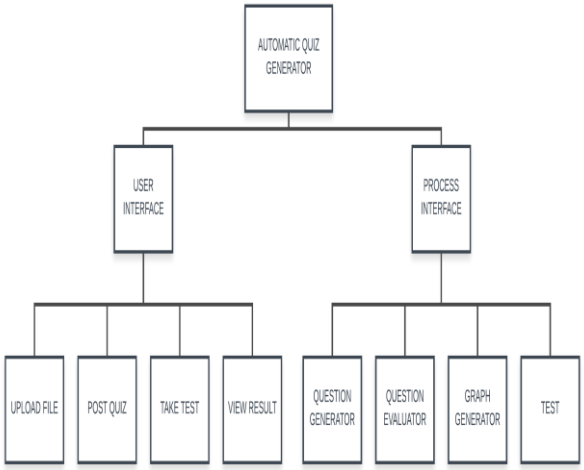

Fig 4 Modular Design Diagram of the proposed system

Above diagram shows modular diagram of automatic quiz generating system. It is divided into user interface and process interface. User interface contains modules like UPLOAD FILE where you can upload file for question generation, POST quiz where teacher can post quiz. TAKE TEST which is used to conduct examination .VIEW RESULT where result can viewed. Process Interface contains module like, QUESTION GENERTOR which is used to generate questions from given file, QUESTION EVALUATOR which will be used for evaluation of answer of students, GRAPH GENERATOR module for generating graph for result, TEST which will manage online exams.

3.1.3 Data flow diagram

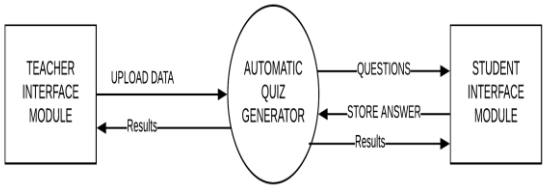

Fig 5 level 0 Data Flow Diagram

The above diagram shows level 0 data flow diagram of automatic quiz generator. It consists of Teacher and student as main entities. And Automatic quiz generator as main process. Teacher will upload data to main process from which question will be generated and used while student taking test. Answers selected by student will evaluated by main process and result will be shown to both Teacher as well as Student.

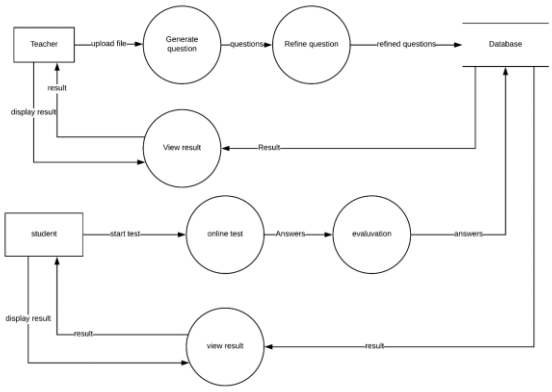

Fig 6 level 1 Data Flow Diagram

Above figure show level 1 block diagram for automatic quiz generator. Initially Teacher will upload file to GENERATE QUESTION process where question will be generated. These questions will be sent REFINE QUESTION process where question will be selected or rejected by teacher. Selected question will be stored in database. Student will start test in ONLINE TEST process. From ONLINE TEST PROCESS, selected answers will be moved EVALUATION process. Where selected answers will be evaluated and results will be stored in database. Both student and teacher can view results using VIEW RESULT process which fetch requested result from database and will present to TEACHER or STUDENT in specified form.

4. RESULT AND DISCUSSION

4.1 Login

Below fig shows login page for users.

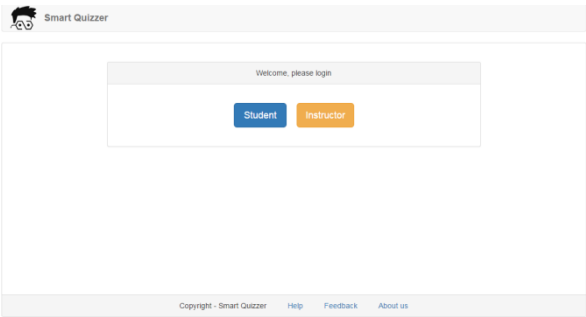

Fig 7 login page

The system consists of two kind of user. One is STUDENT for taking exams and other is INSTRUCTOR for teachers to set quizzes

Instructor Interface

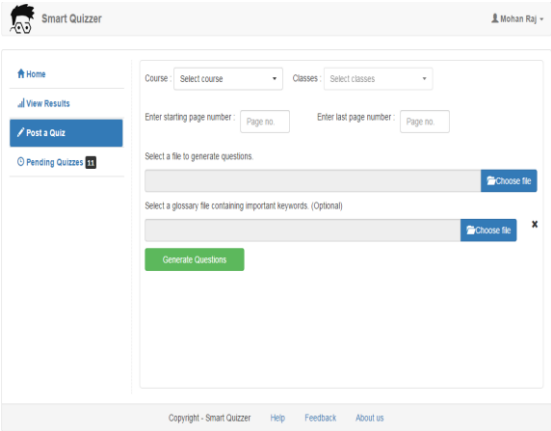

Fig 8 File choosing page

Above Fig shows window where instructor needs to select and upload file from which question should be generated.

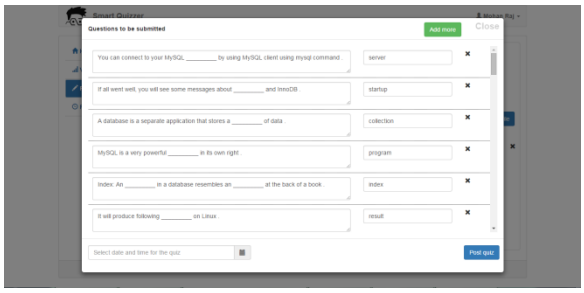

Fig 9 Refining Generated questions

Shows refining page where Instructor will select or reject generated questions.

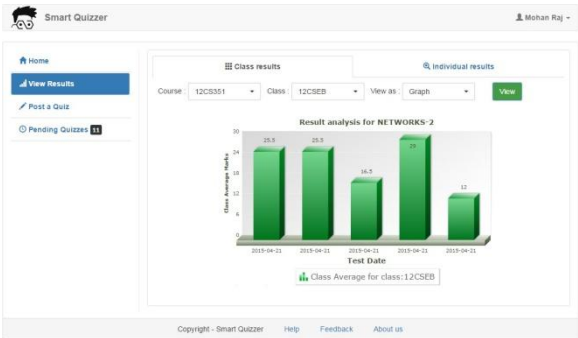

Fig 10 Results of quiz

Figure shows result page, where Instructor can see results of test.

Student Interface

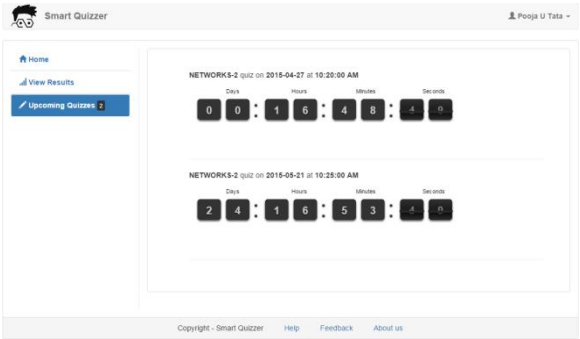

Fig 11 Upcoming Quizes page

Figure shows Upcoming quizzes page where student will get to when are upcoming quizzes.

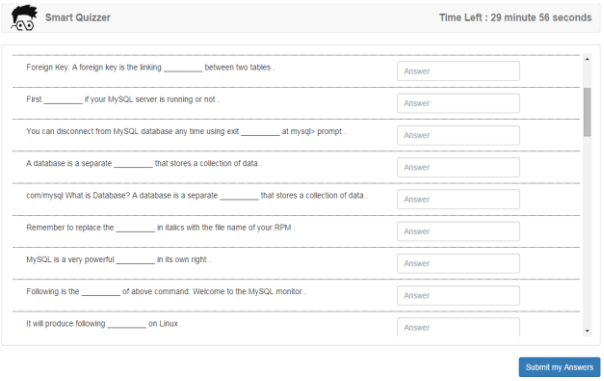

Fig 12 Student taking quiz

Figure shows student taking quiz, where student answers quiz questions.

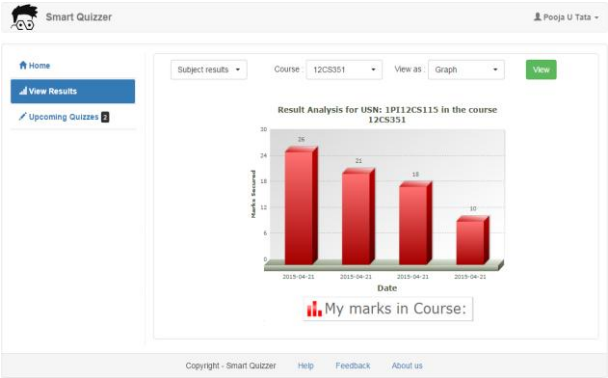

Fig 13 Results of quiz

Figure shows results page, where student can see his results in particular test.

5. CONCLUSION

This Proposed system identifies will generate gap fill (fill in the blank) questions from a given file automatically for English language and through website test for the generated questions will be conducted and result of the test

will be stored in database for future reference .I.e. This system will be more efficient in terms of time and money compared to traditional way of examinations. Future enhancements can be done by improving accuracy of question generation process. Identifiable weakness of student so that he can be tutored and made to give test on those topics more.

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