

SAESA - Semi Automated Evaluation of Subjective Answers

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Abstract - Evaluation of answer scripts is nothing but correcting papers and giving marks to particular answer. Manual evaluation of subjective answers is a tedious and time-consuming process. Also, it's erroneous as faculty is likely to complete the evaluation of the total class as early as possible. There are chances that distinct marks will be awarded to the same answer when it's evaluated by different faculty. SAESA (Semi Automated Evaluation of Subjective Answers) is a tool that is designed to assist the faculty to overcome the above-mentioned problems. The SAESA project is implemented through four modules: one is user interface module, in which we provide required data to the system. Second is the assignment module, in which the faculty assign the marks to important phrases and keywords. Third is evaluation module, which is used to assess the answer script. Fourth is the report module, in which the faculty generate the student report.

Keywords: Machine Learning, Answer scripts, Automated Evaluation, Python Qt, MY SQL server, Pyuic.

I. INTRODUCTION

Evaluation of answer script is correcting the papers and granting marks to particular answer. Evaluation is of two types, manual evaluation and system evaluation. In manual evaluation the papers are evaluated by the faculty. In system evaluation papers are evaluated by the system. The system evaluation allows the faculty to reduce their effort. In the current evaluation system, descriptive answers given by the students are evaluated by the faculty. This is an error-prone process; as different professors are likely to award various marks to the same answer.

As per reference during final semester from Anna university four hundred and twenty students applied for reevaluation of their answer scripts, as they believe that the first evaluation is incorrect. Nineteen percent of the failed students passed after the reevaluation. This shows that the marks obtained during reevaluation differ from the initial evaluation. In the reevaluation, the same answer scripts are given with various

marks. This instance demonstrates one of the problems with manual evaluation of answer scripts.

Marks awarded during manual evaluation depend not only on the content of the answer script, but also on other factors like hand writing, style of answering and even on the perception of the evaluator. Manual evaluation is a time taking process, and any delay in the process would eventually lead to a delay in the announcement of results which is discomfort to the students. For instance, Jawaharlal Nehru Technological University conducted the first semester end examinations for the final year engineering students, during 3rd week of November, 2016 and the corresponding results were announced on 9th Feb 2017. There is time gap of 80 days between the conduction of examination and declaration of results.

Jannat et al developed an Intelligent Classroom System. The primary goal of intelligent classroom system is to produce subjective questions and evaluation of subjective answers. The URL of the webpage and the specific topic are taken as input from the teacher. The questions together with the selected answers are shown to the teacher for confirmation. The questions are generated using data mining techniques.

Evaluation of subjective answers is done using natural language processing techniques. The drawbacks are in manual evaluation system the same answer awarded with different marks when it evaluated by different faculty and the intelligent system failed to understand the synonyms of the words.

II. PROPOSED METHOD

The project aims at developing a tool for the semi-automated evaluation of subjective answers. SAESA is developed for semi- automated evaluation of subjective answers. It uses a smart and systematic method to correct the answers. In SAESA we have admin profile and faculty login profile. An administrator is responsible for the authentication of the faculty, assigning the faculty to assignment process and assigning the faculty to evaluation process. The faculty assigns the marks to particular questions, phrases and

keywords during the assignment process. In evaluation process the faculty evaluate the answer scripts and generate the report.

SAESA evaluates the descriptive answers with the phrases and keywords of the original answer in the answer given by the student. The keywords and phrases of the original answers are stored in the database of the system. The database includes the keyword and phrase entities and the amount of marks to be awarded for each of their occurrences. The SAESA automatically generates the evaluation reports in either .PDF format or .XLS format as chosen by the faculty. The keywords and phrases of the original answers are stored in the database of the system. SAESA accepts disciple answer scripts as text files. The name of the text file, containing an answer script is provided as an input to the system. If the file does not exist, the system will provide an error message. If not, the file will be accepted and evaluated. The system gets the keywords and the corresponding marks to be awarded, from the answer base. It verifies that the keywords exist in the answer script. If phrase occurs in the given answer, then the marks corresponding to that particular keywords are added to the marks to be given to that answer. For the phrases too, the same process is repeated.

The total marks to be awarded are calculated by summing up the marks for keywords. The system can update all of these marks. The system generates a report, in the format (either in .pdf, or in .xls format) chosen by the faculty. This report includes the marks information provided to each keyword and each phrase of the given answer.

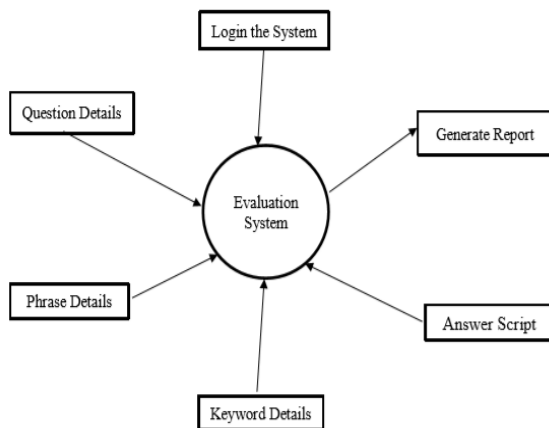


Fig 1: Data Flow Diagram of Proposed Method

We need to create various user interfaces for the storage of information in SAESA. After creating user interfaces, we need

to create one database. The data is stored in the database using user interfaces. In SAESA system first we have admin and faculty login profile. The admin can login to the system using username and password, navigates into admin functionalities screen. The admin functionalities are authenticating faculty, assigning faculty for assigning process and assigning faculty for evaluation process.

The faculty can login to the system using username and password. After login to the system, the faculty navigates into faculty functionalities screen. The faculty functionalities screen contains assignment process and evaluation process. In assignment process the faculty assign the marks to particular question, keywords and phrases. In assignment process we have three buttons. Use the first button to store the questions and marks to that particular question into database. After clicking the first button it will go to another user interface which is having question and marks field. In the same way second and third buttons for storing the phrases and keywords respectively.

In Evaluation process the faculty evaluate the answer script and generate the report. In evaluation process we have three buttons. First button is checking whether that particular file exists or not. Second button evaluates the answer script. Third button is generating the report for the answer. The report contains student information and marks.

III. SAESA ARCHITECTURE

SAESA system contains admin login profile and user login profile. The admin can login to the system using username and password. After login to the system, the admin navigates into admin functionalities screen. The functionalities of admin are user authentication, assigning faculty for giving the marks for keywords and phrases and assigning faculty for evaluation process. If any new faculty want to login to the system, the faculty register the details using registration form. After registration the faculty connect to the system using username and password. After logging into the system, the user moves into the faculty functionalities.

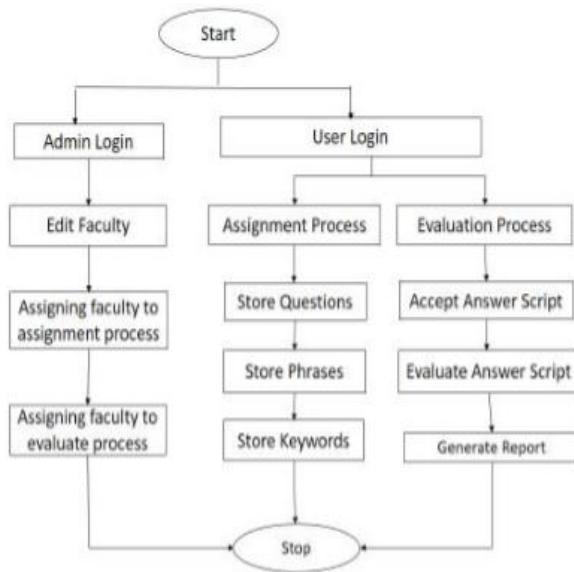


Fig.2: Flow chart for SAESA system

The faculty functionalities are assignment process and evaluation process. Assignment process has three buttons. First button is store questions, store the particular questions into database along with marks. Second button is store phrases, store the particular phrases into database along with marks. Third button is store keywords, store the keywords into database with marks. In SAESA system for storing data we need to enter details like qid, marks and question/phrase/keyword. In Evaluation process we provide answer script to the system. If file name exists, it will read the answer and remove the newline characters. Now the cursor goes to phrase table and check the phrase with answer. If phrase is found then it will allocate marks to particular answer, otherwise not. If file name does not exist it will print error message. Evaluate answer script is used to evaluate the answer script and give the marks. In Generate report the faculty generate the report. The report includes student information, marks obtained after evaluation of answer script and phrase and keyword details. In the evaluation module the faculty correct the answer scripts based on phrases and keywords. This program gives the details of the keywords and phrases, of the answer to be evaluated, from the answer base. The file name is given to the system for evaluating answer script. If file name exists it will correct the answer script, otherwise it prints an error message.

While evaluating the answer the cursor moves to phrases table and take phrases and compare the phrases in the answer. If phrases are present it will give marks to the phrase otherwise it won't assign any marks. After completion of phrase table, it will go to keyword table. The cursor will check

for keywords and if keyword is present in the answer it will add marks. If the cursor presents at the end of the file, then the system will print total marks.

IV. METHODOLOGY

The SAESA system includes an admin and faculty login profile. The Administrator have username and password to login the system. The role of admin is authenticating user, allot the subject to faculty for assignment process and allot the subject to faculty for evaluation process. In SAESA system we have two processes. One is assignment process and other is evaluation process. In assignment process we have three functionalities. First functionality is store the particular questions into database along with marks. Second functionality is store particular phrases into database along with marks. Third functionality is store particular keywords into database along with marks.

In evaluation process we have three functionalities. First functionality is check whether the filename present in the system or not. Second functionality is evaluating the answer script. Third functionality is generating the report. SAESA system have four modules. User Interface module, is used to provide the needed data to the project. In the assignment module the faculty assign the marks to particular question, phrases and keywords. In assignment module important keywords and phrases are stored in database. Through a PyQt Screen, the faculty may indicate the marks (0.25/0.50) which may be issued for these keywords and phrases. Likewise, faculty can assign the marks for important phrases and keywords.

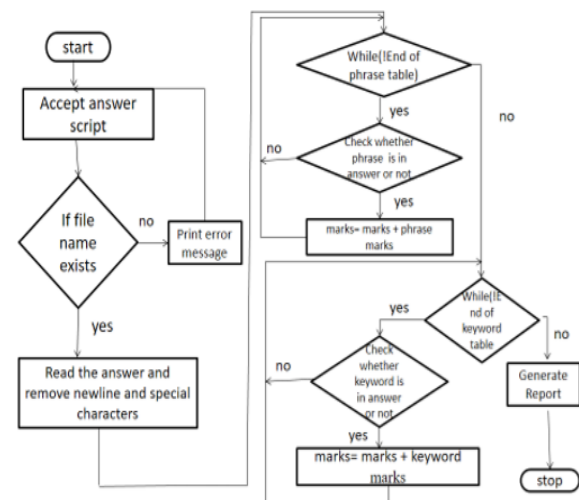


Fig 3: Flow chart for Evaluation Process

In the evaluation module the faculty evaluate the answer script. In evaluation module SAESA uses keyword separation and matching algorithm. The algorithm searches for the occurrence of the keyword and phrase in the given answer, and awards the marks mentioned for that keyword and phrase, if it occurs in the answer. Finally, it sums up the marks awarded. In the report module the faculty generate the report includes the marks awarded based on the evaluation along with student information

V. IMPLEMENTATION

SAESA system has admin profile and faculty login profile. In SAESA (Semi Automated Evaluation of Subjective Answers) system first we need to create various interfaces to connect and save the data. After creating user interfaces, we need to create one database. The interfaces are saving the data into database. To store keywords and phrases along with marks we need to generate distinct tables in the database. We store the information in tables using interfaces. Based on keywords and sentences, the scheme evaluates the answer script.

In evaluation process we give file name as input to the system. If file name exists, it will correct the answer otherwise it prints error message like file does not exist. While evaluating the answer the system first goes to phrase table and take phrases and compares in the answer. If phrases are matched it will add marks to that particular phrase otherwise not give marks. After completion of phrase table, it will go to keyword table.

In the answer we have expected keywords and synonyms for that particular keyword. For expected keywords we assign more weightage and for synonyms we assign low weightage. While storing keywords and phrases we need to sum up the total count to maximum marks of a particular question. SAESA system not only deals with the evaluation of question papers, but it also generates the report to the students.

- **Admin Login Profile**

In SAESA system the admin places a major role. The responsibility of the admin is authenticating the faculty, subject allotment to faculty for assigning marks and subject allotment to faculty for evaluating answer script. The admin login the system using username and password. The admin can add the faculty into system. Based on the subject the admin assigns the faculty for assignment and evaluation process. SAESA system has assignment process and evaluation process

- **Faculty Login Profile**

The faculty can login to the system using username and password. After login to the system the faculty has two

processes. One is assignment process and other is evaluation process. The faculty can select one process based on the subject. In assignment process the faculty store the data along with marks. In evaluation process the faculty correct the answer and generate report.

In SAESA system we have two processes. Assignment process is for storing data along with marks and evaluate process is for evaluating answer script.

- **Assignment Process**

The admin allots the subjects to faculty for assigning marks. In assignment process we have three buttons. Save the questions in database is, store the questions into database and assign the marks to question. Save the phrases in database is, store the phrases in database and assign the marks to phrases. Save the keywords in database is, store the keywords into database and assign the marks to keyword.

- **Evaluation Process**

The admin allots the subjects to faculty for evaluating answer scripts. In evaluation process we have three buttons. Accept answer script button is, check whether the file name exists in the system or not. Evaluate answer script button is, correct the answer and assign the marks to phrases and keywords in the answer. Generate report is, generate the report to the student.

MODULES

SAESA is developed for semi- automated evaluation of subjective answers. It uses a smart and systematic technique to evaluate the answers. SAESA evaluates the descriptive answers based on keywords and phrases in the answer written by the student, with the keywords and phrases of the original answer. Answer base contains the keywords and phrases with marks to be awarded for each of their occurrences. SAESA (Semi-Automated Evaluation of Subjective Answers) comprises of four modules.

1. UI module.
2. Assignment Module.
3. Evaluation Module.
4. Report Module.

ALGORITHM STEPS

1. Start
2. Login the system.
3. Connect to database

4. Open ('answer script', 'r') as file
5. text=myfile. read (). replace ('\n', '')
6. Select phrase from phrase table for given question
7. if (text. find(phrase)!=-1 Marks=tmarks+0.5
8. Select keyword from keyword table for given question
9. if (text. find(keyword)!=-1 marks=tmarks+0.25
10. Insert marks into marksdiv table
11. Generate report 11. Stop.

VI. RESULT



Fig 6: Faculty Functionalities

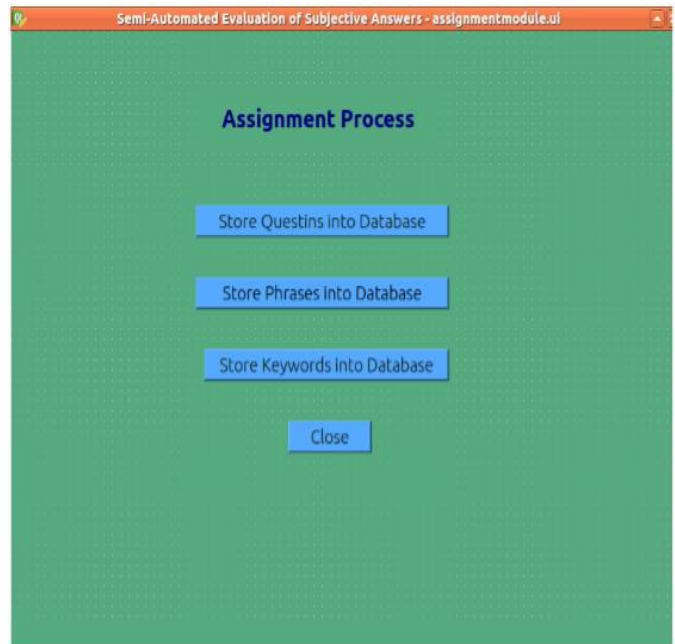


Fig 7: Assignment Process

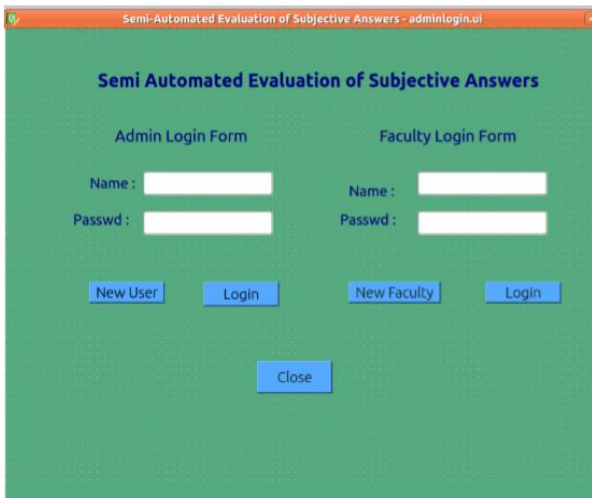


Fig 4: Admin and Faculty Login Page

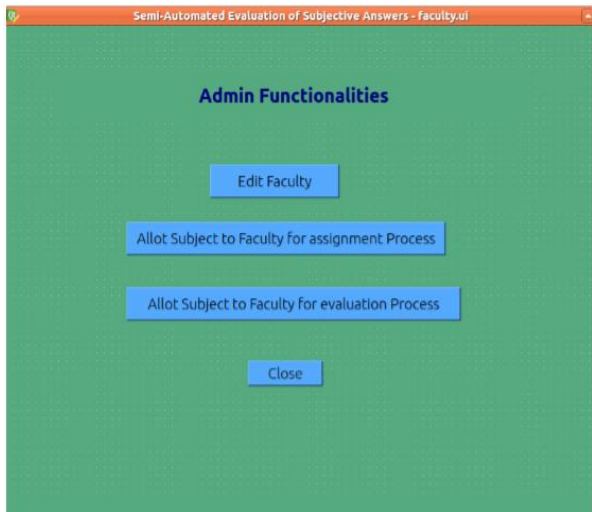


Fig 5: Admin Functionalities

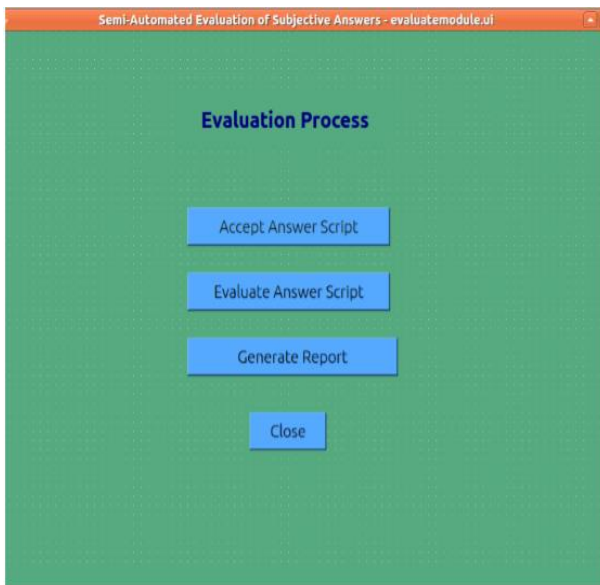


Fig 8: Evaluation Process



Fig 9: Generate Report details

Name: Gouthami	Sub Name: STM	Sub Code: 113AB
Roll NO: 814	Total Marks Obtained: 12.5	Max Marks: 25
		Grade: C

Qno.1

less effective when compared to functional testing	0.50
method for performing white box testing	0.50
structural testing	0.25

Total marks obtained for Qno.1 : 1.25

Qno.2

goal of testing is detect errors	0.50
program	0.25
expected	0.25
scheduled	0.25
constraints	0.25
debugging	0.25
unknown conditions	0.25
capability	0.25

Total Marks obtained for Qno.2 : 2.25

Fig 10: Report

VII. CONCLUSION AND FUTURE ENHANCEMENT

Automation is the use of various control systems for operating equipment such as machinery, processes in factories, boilers and heat-treating ovens, switching on telephone networks, steering and stabilization of ships, air crafter and other applications and vehicles with minimal and reduced human intervention. Some processes have been completely automated. The biggest benefit of the automation is that it saves labor. It is utilized for energy savings energy and materials and to improve quality, accuracy and precision. In combination with mechanical, hydraulic, pneumatic, electrical, electronic devices and computers, automation has been achieved through various means. Typically, complicated systems, such as modern factories, aircraft and ships, use all of these combined techniques.

Semi-Automated Evaluation of Subjective Answers for Online Examination Systems would be beneficial for the universities, schools and colleges for Academic purpose by providing ease to faculties and the examination evaluation cell.

The developed SAESA tool is applied to evaluate the answer scripts of the subject entitled “software testing methodologies” and can be expanded to include all subjects regardless of departments by design. Improvements to be done to evaluate all the answers scripts in one go.

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