A Project Review-1 Report

on

Automatic Answer Checker

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ABSTRACT

We are pleased to present Automatic Answer Checker that will ease out the process of checking of answer papers with accuracy. The system will let students give exam online, calculate the results automatically as well as preduce a record for the administrator. The paper will focus on correcting on the basis of certain keywords that every answer will contain and give marks to the students according to the presence of the keywords in the answers. This system will help reduce all human errors thereby making the system more efficient. An automatic answer checker application that checks and marks written answers similar to a human being.

This software application is built to check subjective answers in an online examination and allocate marks to the user after verifying the answer. The system requires you to store the original answer for the system. This facility is provided to the admin. The admin may insert questions and respective subjective answers in the system. These answers are stored as notepad files. When a user takes the test he is provided with questions and area to type his answers. Once the user enters his/her answers the system then compares this answer to original answer written in database and allocates marks accordingly. Both the answers need not be exactly same, word to word.

The system consists of in built artificial intelligence sensors that verify answers and allocate marks accordingly as good as a human being. This software application is built to check subjective answers in an online examination and allocate marks to the user after verifying the answer. The system requires you to store the original answer for the system. This facility is provided to the admin. The admin may insert questions and respective subjective answers in the system. These answers are stored as notepad files.

When a user takes the test he is provided with questions and area to type his answers. Once the user enters his/her answers the system then compares this answer to original answer written in database and allocates marks accordingly. Both the answers need not be exactly same, word to word. The system consists of in built artificial intelligence sensors that verify answers and allocate marks accordingly as good as a human being.

In todays scenario , examinations can be classified into 2 types , one is objective and the other is subjective . Competitive ex ams are usually of mcq types and due to this they need to be conducted on computer screens as well as evaluated on them. Currently , almost every competetive exam is conducted in online mode due to the large number of students appearing in them . But apart from competitive exams , computers cannot be used to carry out subjective exams like boards exam . This brings in the need of Artificial Intelligence in our online exam systems . If artificial intelligence gets implemented in online exam conduction systems , then it will be a great help in checking subjective answers as well. Another advantage of this would be the speed and accuracy with which the results of the exams would be produced. Our proposed system would be designed in such a way that it will give marks in a similar way as of a human. This system will hence be of great use to educational institutions .

Every year educational institutes conduct various examinations, which include institutional and non-institutional competitive exams. Now a day's online tests and examinations are becoming popular to reduce the burden of the examination evaluation process. The online exams include either objective or multiple-choice questions. Nevertheless, the exams include only objective or multiple-choice questions. However, subjective-based questions and answers are not involved due to the evaluation process complexity and efficiency of the evaluation process. An automatic answer checker application that checks the written answers and marks the weightage similar to a human being is more helpful in the current modern era is necessary.

.Hence, the software applications built to check subjective answers may be more useful for allocating marks to the user after verifying the answers for online examination. This type of tool/application/system has the challenge of having an abundant resource database, including questions, corresponding answers, and the marks allocated to the corresponding answers. At the same time system need to verify the answers provided by the users by checking the template answers and the answers provided by the user. However, Artificial Intelligence is required to identify the core element of the answers while allocating marks. Hence, an Artificial Intelligence-based answer verifier is proposed to do the job of examiner/evaluator automatically. As a result of this artificial intelligence-based answer verifier, the evaluator's time and energy can be conserved, with improved work efficiency.

CHAPTER:-1

INTRODUCTION

The Online Examination is very helpful to users. The aim of this project is to provide quick, immediate and easy way to appear the exam. It can provide special advantages to the students/applicants that can't be found anywhere else through partnerships with agencies/boards that are conducting the multiple choice type examination. Its working is that students allows registering for the exam and teacher allows registering for conducting the exam. This will continue to grow ultimately providing a wide breadth of services for beneficial to the students. Tests can be created on a random basis per student. The online examination system can automatically add the marks allocated in each question to determine the total mark for the test. The online examination system limits the number of times a student can write a test. Students can be forced to go through all the questions at least once, before exiting the test. Students can be allowed to exit the test before completing all the questions. The objective is to check and mark written answers similar to a human being. This software application is built to check subjective answers in an online examination and allocate marks to the user after verifying the answer. The system requires you to store the original answer for the system .Once the user enters his/her answers the system then compares this answer to original answer written in database and allocates marks accordingly. Both the answers need not be exactly same, word to word. Examiners get bored by checking many answer sheets, hence the system reduces their workload by automating the manual checking process accurately to provide unbiased results questions papers each time can be avoided. Examiners get bored by checking many answer sheets, hence the system reduces their workload by automating the manual checking process accurately. The system calculates the score and provides results instantly .It removes human errors that commonly occur during manual checking. The system provides an unbiased result. Thus the system excludes human efforts and saves time and resources. This system can be used in schools, colleges, coaching and institutes for checking answer sheets .The system can also be implemented in different organizations that conduct regular exams.

An automatic answer checker application that checks and marks written answers similar to a human being. This software application is built to check subjective answers in an online examination and allocate marks to the user after verifying the answer. The system requires you to store the original answer for the system. This facility is provided to the admin. The admin may insert questions and respective subjective answers in the system. These answers are stored as notepad files. When a user takes the test he is provided with questions and area to type his answers. Once the user enters his/her answers the system then compares this answer to original answer written in database and allocates marks accordingly.

Automating the answer checking process would not only relieve the exam checker but the checking process would also get way more transparent and fair as there would not be any chances of biasedness from the teacher side . Nowadays various online tools are available for checking multiple choice questions but there are very few tools to check subjective answer type examinations .Currently there are many exam conduction ways , be it online exams or OMR sheet exams or MCQ type exams .Various examinations are conducted every day around the world . the most important aspect of any examination is the checking of the answer sheet of the student . Usually it is done by the teacher manually ,thus making it a very tedious job if the number of students is very large. In such a case automating the answer checking process would definitely prove to be of great use .

This project aims to carry out the checking of subjective answer type examinations by implementing machine learning .This application can be used in various educational institutes for checking subjective answer type examinations . Further , on improving the application , it can even be extended for conducting online subjective answer type examinations application , it can even be extended for conducting online subjective answer type examinations. On running the application , the main window of the application will give two options to the user , whether to login as an admin or as a student

. After selecting one of the options , the user will get to see a login window where he will be asked to login using his/her credentials . The admin will have the options like uploading the question paper and seeing the responses of the students . The student will have the option to upload the answer sheet and see the marks alloted to them there and then .

Why did I choose Automatic Answer Checker ?

There is a lot of reasons why introduction of Artificial intelligence into the online exam systems would prove to be of great use. Firstly , as currently exams are marked by examiners and so this leads to fatigue and boredome as they have to check large number of answer sheets , but with the online system , this problem automatically gets solved . Moreover, the accuracy and speed with which a computer can generate results , it is something which a human would take hours to do. The proposed system would also produce unbiased results which would further make everything more transparent

System is:

Load Balancing:
Since the system will be available only the admin logs in the amount of load on server will be limited to time period of admin access.

Easy Accessibility: Records can be easily accessed and store and other information respectively.

User Friendly: The system will be giving a very user friendly approach for all user.

Efficient and reliable: Maintaining the all secured and database on the server which will be accessible according the user requirement without any maintenance cost will be a very efficient as compared to storing all the customer data on the spreadsheet or in physically in the record books.

Easy maintenance: AI Answer Verifier system is design as easy way. So maintenance is also easy. The project report entitled "online subjective answer checker" has come to its final stage. The system has been developed with much care that it is free of errors and at the same time it is efficient and less time consuming. The important thing is that the system is robust. Also provision is provided for future developments in the system. The entire system is secured. This online system will be approved and implemented soon.

CHAPTER 2

LITERATURE SURVEY

In todays world , competition among people has increased substantially . With growing population of the world , competetion among people can be seen everywhere as everyone wants to live life of their dream . Everyone wants to be better than everyone else . Another big reason for this increased competetion is limited resources , particularly jobs if we limit our focus of study to professional world . This competition begins in ones life from schools and colleges . The criteria to decide who is better than other academically is decided by exams in schools and colleges . The person who scores the highest marks is considered to be the most intelligent student , as simple as that . There are a number of types of examinations that are conducted all around the world . Some types are online examinations , mcq types examinations , omr based examinations .

The next part of examination and it can also be called the most important part of the examination is its evaluation process . All the above listed examinations are evaluated either manually or in automated form . Another important type of examination is subjective examination . Subjective examinations are the ones that consist mostly of theory . Evaluating such examinations can be tiring and boring for the examiner especially when the number of students is quite large . The presented application intends to solves this problem by automatically checking the answer sheet of the student .

2.DATA COLLECTION

Data collection can be described as the process of firstly collecting and then measuring the information against the changes which are targeted in a well established system, which helps an individual to evaluate the situation and find answers to particular relevant questions. Data collection is such a part of research which exists everywhere in different domains of studies be it physical or social sciences, business, humanities etc. The main purpose of this phenomenon of Data Collection is that it helps in gathering quality material and evidence that would ultimately lead in the formation of concrete answers to the questions presented . The data that has been used in this project has been created from scratch .

Sheeba Praveen, Published in International Journal of Innovative Research in Computer and Communication Engineering. Vol. 2, Issue 11, November 2014. As observed that these systems contain only multiple choice questions and there was no provision to extend these systems to subjective questions. The paper presents an approach to check the degree of learning of the student/learner, by evaluating their descriptive exam answer sheets. By representing the descriptive answer in the form of graph and comparing it with standard answer are the key steps in our approach.

B vanni, M. shyni, and R. Deepalakshmi [4] OCR refers to translate handwritten text to format which is machine readable which can be used for searching, editing and indexing. This paper is using the artificial neural network to achieve high accuracy for optically recognize the character. The proposed approach is tested and implemented on character database consisting of English characters, digits and special characters.

J.Pradeep , E.Srinivasan and S. Himavathi [7] worked on off-line handwritten alphabetical character recognition system which uses multilayer feed forward neural network. A new method other than horizontal and vertical method was introduced called diagonal based feature extraction. Fifty datasets were taken to train the network. Each dataset contained 26 alphabet written by different people. The system performed quite well with higher levels of accuracy in recognizing the alphabets.

CHAPTER 3

SYSTEM ANALYSIS

3.1 REQUIRED TOOLS

- ### 3.1.1 Hardware Requirements
  - Processor – i3
  - Hard Disk – 5 GB
  - Memory – 1GB RAM
  - COMPUTER: Personal
  - Processor: Core 2 Duo
  - RAM: 2 GB.
  - Hard Disk Drive: 320 GB
  - .Monitor: 15 inch color Samsung.
  - Mouse: Logitech
  - Keyboard: Board with 104 Keys

- ### 3.1.2 Software Requirements
  - Windows Xp, Windows 7(ultimate, enterprise)
  - Visual studio 2010
  - Sql 2008
  - Front End : ASP.NET 2010
  - Back End : SQL Server 2008

3.2 MODULE

- Admin

  The Admin is a person who run and manage the system in this project the owner or director of the school has rights of admin.
  The Admin creates the structure of a system to creating Subject.
  ✓ Update Student Profile✓ Add Subject✓ Add Question ✓ Add Answer ✓View Feed Back
 ✓ Logout

- Student

  All students have unique username and password to access the system. After login to system student can view his Profile and manage his account.

If any student has any problem regarding education he can directly make complain to his class Feedback using this system.
Student can Type for Question and Answer through the system and he can get reply from his Answer status.
✓View Your Profile ✓Check Question✓ View Answer
✓ FeedbacK ✓Logout
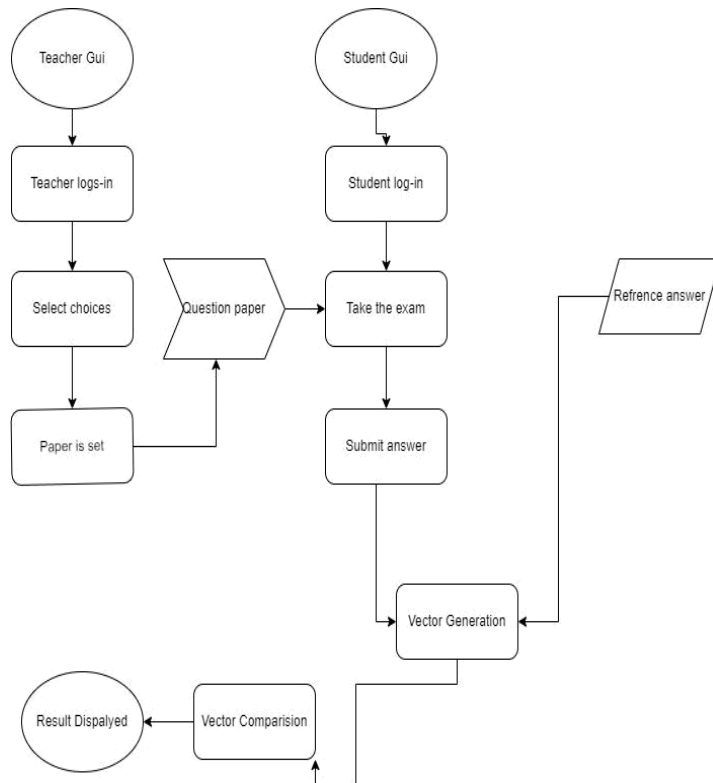
Features

User Registration/ Login: User taking the test must first create an account in the system by registering themselves and then can login into the account to take test.

Admin Login: Admin would be having a login account. He can add questions in the system and their respective answers. The answers are stored as a base for reference for AI to use while checking answers.

Answer checking: The system checks the answer by matching the keywords in original and users answer. The other factors are the number of sentences or points that user has written.

Answer marks allocation: The marking criteria is decided by the admin and stored in the system for reference. AI uses these references and allots respective marks to the user.

Question answer addition: Admin can add questions from the system.

3.3   EXISTING SYSTEM

Existing System : In the existing system the exams are done only manually but in proposed system we have to computerize the exams using this application.
Disadvantages
- The system must be given proper inputs otherwise system can produce wrong results.
- Lack of security of data.
- More man power.
- Time consuming.
- Consumes large volume of pare work
- .Needs manual calculations.
- No direct role for the higher officials

Question Paper

In 1820, Avogadro became a professor of physics where?

Where was Volta born?

What does Avogadro's Law state?

Why did Avogadro lose his chair at the University of Turin?

A year before improving and popularizing the electrophorus, what did Volta become?

result

3.4 PROBLEM FORMULATION

- Main issue of subjective examination is the explanation, example and description given by students which may have different words i.e. synonym used to frame the sentence but they must have the same meaning and point's necessary for the answer to be correct.

- Second issue is the size or the length of the sentences in an answer. Indirectly the answer vary person to person, which requires huge efforts to put them into the category according to context.

If we consider the problem of online subjective examination it needs a good language command many a times may be literature or technical question paper thus it can be preview under Natural Language Processing.

3.5 PROPOSED SYSTEM

: The aim of proposed system is to develop a system of improved facilities. The proposed system can overcome all the limitations of the existing system. The system provides proper security and reduces the manual work.

Advantages

- Examiners get bored by checking many answer sheets, hence the system reduces their workload by automating the manual checking process accurately.
- The system calculates the score and provides results instantly.
- It removes human errors that commonly occur during manual checking.
- The system provides an unbiased result.
- Thus the system excludes human efforts and saves time and resources.

METHODOLOGY

DEVELOPMENT ENVIRONMENT

The portion of the application which consists of Machine Learning to perform the analysis of the students answer sheet has been conducted in Google Colab Notebook. This Notebook is widely used for performing and conducting projects and experimentations in the field of data science and visualisation of data. It is an open-source tool based on web. Most of the machine learnig applications out there make use of this notebook.

Visual Studio Code has been used for developing the Graphical User Interface through Flask . Visual Studio Code is an Integrated Development Environment developed by Microsoft. It provides us with a vast array of features which causes it to be one of the most preferred alternatives for development of applications in frameworks like Django and Flask which are based on Python . It also supports many other frameworks and is usually the go to option for any code designer for code editing.

ANALYSIS OF DATA

- The data set is collected in the very first step which consists of answers to the questions in the question paper.

- Upon collecting the data , all the text in the data is converted to lowercase .

- After the conversion to lower case , word tokenization is performed on the text . Word tokenization is the process of splitting a large sample of text into words. This is a requirement in natural language processing tasks where each word needs to be captured and subjected to further analysis like classifying and counting them for a particular sentiment etc. The Natural Language Tool kit (NLTK) is a library used to achieve this.

- Moving forward , next important step that is performed is removal of stopwords and punctuations . A stop word is a commonly used word (such as the, a, an, in) that a search engine has been programmed to ignore, both when indexing entries for searching and when retrieving them as the result of a search query.We would not want these words to take up space in our database, or taking up valuable processing time.

- At the end , stemming is applied to the dataset leading to a separate set of word . Stemming is the process of producing morphological variants of a root/base word. Stemming programs are commonly referred to as stemming algorithms or stemmers. A stemming algorithm reduces the words chocolates, chocolatey, choco to the root word, chocolate and retrieval, retrieved, retrieves reduce to the stem retrieve. Stemming is an important part of the

pipelining process in Natural language processing. The input to the stemmer is tokenized words.

FORMATION OF WEBSITE

- The website has been designed using technologies like flask which is a python based framework .

- The website has a main page which provides the user to login as an admin or as a student .

- The admin window provides the option to upload the question paper

- The student window has got the facilities to upload his/her answer sheet .

WORKING

An automatic answer checker is an application that helps in checking the answer sheets submitted by the student in a similar manner as a human being .

This application has been built with an aim to check the subjective and long answer type questions and then allot marks to the students after performing the verification of the answers

To carry out the whole operation , it is required by the user to store the answers of the questions so that the application can cross verify the answers from the answer sheet .

In this system , the admin has been provided the options to upload the question paper and also see which student has submitted the answer sheet .

When the student successfully logs into the system , he/she would be able to view the question paper and download it as well.

Upon completing all the answers , the student would be required to upload the answer sheet in pdf format for the system to evaluate it.

The answers of the questions may not be word to word same as in the answers given by the admin . Variations in the answers could be seen and that would be easily handled by the system and so the student need not worry about the incorrect checking of the answer sheet .

The system has been built with the help of various machine learning algorithms that at the end calculate marks of the students and return the same to them.

The application would be consisting of the following components :

Logging Facility:

Upon opening the main window of the application , the user would be greeted with two options namely Admin and Student . User can choose any one option and proceed further .

Student log-in: For the student log-in the system uses the name of the student as ID and the registeration number of the student as password to successfully log-in . If the student fails to log-in, then he would be required to re-enter the ID and password . After successfully logging-in , the student would be able to see the question paper uploaded by the examiner as well as he would be able to download it.

The student would then be required to upload the answer sheet that he/she wants to be evaluated . Upo uploading the answer sheet , the student would be required to click the see marks button and then the marks of the student would be displayed along with the grade .

Admin log-in: The admin is a teacher and so this log-in has been configured for them .

The admin would be required to input his/her name as ID and a specific password assigned to the as password to be able to log- in into the system.

The admin will have the option to upload the question paper and see which student has subitted his/her answer sheet and which student hasnt.

Answer Checking Process: From the training input that would be provided to the machine learning algorithms , the system would perform word tokenization , remove stopwords and punctuation and also perform stemming which at the end would yeild a set of separate words . From these set of words , the system would then decide a set of keywords that must be in the answer . Depending on the number of keywords in the answer , appropriate marks would be given to the student .

ALGORITHM

Step 1: Start

Step 2: Main window opens

Step 3: Login as Admin or a Student If user logins as a Student , goto step 4

If user logins as an Admin , goto step 8 Step 4: Student window opens

Step 5: View / download question paper Step 6: Upload answer sheet.

Step 7: Click see marks button Step 8: Admin window opens Step 9: Upload the question paper Step 10: See responses of students

EVALUATION

The project proposed has been evaluated on terms of various aspects to get a deep insight into the accuracy of our proposed method . The first aspect is on the basis of Quality . The Automatic Answer Checker was evaluated on the basis of quality to measure the accuracy of our system. The second aspect on which evaluation was conducted is performance which was done to get a deep insight into the comparison of automated answer checking method with traditional answer checking method .

QUALITY EVALUATION

A survey was conducted whose sole purpose was to check the quality of the automatic answer checker system . This survey was conducted on a bunch of university students as wll as on the faculties of various departments in the university . Choosing such a sample was obvious as our automatic answer checker is related to their domain . There was almost an equal ratio of male and female among the sample chosen for survey . When all the results of the survey were analysed , we got to know that 85% of the survey participants strongly agreed and 15% of them agreed to the fact that our designed system was giving precise results when they used it . 77% of the survey participants strongly agreed and 23% of them agreed to the fact that the efficiency of our designed system was fast enough to fulfill all of their tasks. 97% of the survey participants strongly agreed and 3% of them agreed to the fact that designed system was quite user friendly and easy to use even when they had not used any similar typoe of thing before. 95% of the survey participants strongly agreed and 5% of the participants agreed to the fact that all the operations of user were fulfilled by the designed system . Thus , to sum up , each one of the persopn who participated

in the survey was very much satisfied by the designed system. Therefore , our designed system passed the quality evaluation test pretty well .

AUTOMATIC SYSTEM V/S TRADITIONAL SYSTEM

This automatic answer checker has been experimented on a couple of students of the university . This study was done with the sole puropose of finding out the measures of evaluation such as precision , accuracy , recall , F-measure which would further help us in comparing the effectiveness of automated answer checking with the traditional approach of checking the answer sheets.

The following table shows the evaluation measure namely recall , accuracy , precision , F-measure . The True Positive represents the total number of questions that were answered accurately and which were actually the correct answers and so they are then termed as positive . The True Negative represents the total number of questions that were answered as incorrect by our system and in reality as well , they were incorrect and so they are then termed as negative. The False Positive represents the number of questions that were declared by our system as correct but in reality they were incorrect . False Negative represents the total number of questions that were declared by our system as incorrect but in reality they were correct .

Evaluation Measure	Expression
Recall	TP / (TP+FN)
Precision	TP / (TP+FP)
Accuracy	(TP+TN) / (TP+TN+FP+FN)
F-measure	(2*Recall*Precision) / (Recall + Precison)

Table 1. Evaluation Measures

Figure depicts the difference between the automated approach and the traditional approach on the basis of evaluation measures.The Recall is also known as True Positive Rate and was observed to be 0.9712 for the automated approach where as it was observed to be 0.9443 in the case of traditional approach . The Precision is also called Positive Predictive Value and it was observed to be 0.9062 in the automated approach where as it was observed to be 0.9771 in the case of traditional method . The Accuracy is also called True Results and it was observed to be 0.8800 in the automated approach where as it was observed to be 0.9500 in the case of traditional method . F- measure can also be stated as the geometric mean of Recall and Precision and it was observed to be 0.9311 in the automated approach where as it was observed to be 0.9656 in the case of traditional method .

From this study , we can easily make out that the system that we have developed is quite near to the traditional method for checking theanswer sheets . On comparing both the methods on the basis of evaluation measure , we can conclude that the Recall , Precision , Accuracy , F-measure are higher in the case of traditional approach than the automated approach .

 This is the performance analysis between the automated approach and the traditional approach. The Below bar graph clearly depicts the differnce in the marks given by the system and the marks given to the student following the traditional approach . As it can be clearly seen that the difference between the marks given by the system and the marks given in the case of traditional method is marginal , it clearly shows that our system has been designed with high accuracy and precision . This further goes on in proving the reliability of our designed project in correctly predicting the marks of the student .

Comparison between the marks given by system with the marks given in traditional method . Upon seeing the marks predicted by our designed project and when we compare them with the marks that would have been alloted to the student had the checking been done following the traditional method , we found that the Mean Square Error in correctly predicting marks comes out to be 0.205 . Observing the value of the mean square error , we can no doubtly conclude that our system has been designed with quite high precision and can be considered to be highly reliable when it comes to predicting the marks of the students correctly .

Chapter:-4

Conclusion:-

The system calculates the score and provides results instantly. It removes human errors that commonly occur during manual checking. The system provides an unbiased result. Thus the system excludes human efforts and saves time and resources.

The project report whose title is Automatic Answer Checker has now reached its last stage . The application has been made keeping every possible chance of error in mind and so the system is quite efficient and reliable. The application has a very unique property of being robust in nature due to which there are many ways of implementing improvisations in the application in the near future . The application would soon be approved and authenticated and then implemented . Future work would be consisting of creating an algorithm for the assessment whose purpose would be tofind all the syntax errors in our keywords and then we would be investigating it for high performance and high equality for addressing them .

Output:- It will show the calculated plagiarism of two answer sheets and show its percentage as the output.

SET PAPER

Choose the set

Choose No. of Questions

Choose Complexity

Click to proceed

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