INTRODUCING A NOVEL FRAMEWORK FOR ONLINE DESCRIPTIVE EXAMINATION SYSTEMS UTILIZING NATURAL LANGUAGE PROCESSING

[1] GAJJELA SANDHYARANI,[2] SRILEKHA THOTAKURI,[3] AMBATI MUKESH

[123]Assistant Professor

Department of CSE

Vaagdevi Engineering College, Bollikunta, Khila Warangal, Warangal, Telangana, India ,506005

ABSTRACT:

This world has seen a lot many examination portals that are deployed over several servers which are used to conduct online examination for various purposes among which some may include conducting a test for entrance examinations, or olympiads at national and international level and while some portals are designed to conduct a test for placement purposes. But what we have seen is that mostly all the portals are designed to conduct tests that contain multiple choice questions. Here our aim is not to work on the technology that is already existing, rather some technology that is very rare. Here we talk of the descriptive online examination system. Multiple choice questions are easy to deal as they have a question, a few options and a field in the same question that stores the correct option in the database. While in the case of descriptive questions it is not so. It brings in or uses the concepts of Natural Language Processing or NLP to assign marks to answers. Answers are nothing but strings and the job of the model is to do some operations on the answer string such that it can assign the correct marks to answers written by the examinee. The data is basically collected from a descriptive online examination system. Further, it is analyzed and the designed model assigns accurate marks to the answers for the question. The back-end is written in Python where the web framework used is Django, the library used for Natural Language Processing includes NLTK and for database purpose, SQLite version 3 is used, while for the front-end HTML version-5, CSS version-3, Bootstrap and Javascript is used.

I.INTRODUCTION

We come to hear news from around the globe that a particular exam was conducted for a job or for a college or examination in schools and the result was published after some time, while this is a good way to conduct an exam but it is inefficient with respect to the current world where automation is the future. The examination system relies on manual work from printing to transporting the paper to the examination hall, then invigilation and the most tedious task of checking the answer sheets which is a huge mess for any examiner which sometimes leads to resource loss. Also, we hear news about paper leaks and answer sheet being lost in the transporting process. The manual checking process will always have that human error based on certain factors like biasing, the mood of the examiner, target completion and much more such factors. Also if we take account of all the paper wastage and the stationary waste which harms our environment leading to do more bad then good as the enormous amount of trees being chopped off across the world for the process. This helps us understand that the offline examination system is not cost effective or time efficient, resources are also

wasted in the process and moreover we all know that resources are scarce in nature and we need to utilize it efficiently to get the maximum output of it.

While the offline examination system has a big disadvantage but are not getting replaced at a bigger scale because new online examination system features only multiple choice type of question's while most of the exams contain descriptive question for which multiple choice answers do not work and hence they are not that compatible and efficient to replace it at a larger level. We all know that if we have to remove a universally accepted system, the new system should not be just good, rather it should be able to make a quality difference so that the organizations accept it. While there are some examination system and they are good at evaluating the answers but they have little to no scope for the descriptive ones and the analysis is not well implemented to get meaningful results. Even most famous of them just have a simple system of storing the correct options in the database and just matching the correct option with it to calculate the result.

In the proposed model we are taking the online examination system to a new level by enabling the

examinee to write descriptive answers which will get evaluated on their own i.e automating the entire offline examination system with the efficiency of computing having no human error involved, this can be done using NLP or Natural Language Processing. The evaluated answers will be stored in the database and they can be viewed anytime and a particular student profile will be maintained for better evaluation of the student.

This will be a huge boost to the online examination system as this will allow it to overcome its biggest con and it will also help the online examination system to stretch its paw even in the half-yearly or annual examination conducted by schools or college for evaluating the profile of the student. This will have instant benefits like the system will relieve the burden of the teachers and professors of checking copies and in return they can be more productive with their time in teaching things, this will also eliminate biasing in answer script checking and will have leased space for any human error as copies would not be scanned and the entire marks will be allotted according to the way answers are written by the examinee while he was on and there will be little to no space for acquisition, it will help in resource management as this will cut corners on stationery products, it will also have greater efficiency with respect to time as it will produce instantaneous results and will be more secure and reliable.

Talking about the technology used in order to build such a model for evaluating descriptive answers, NLP or Natural Language Processing is has a great role to play. NLP can do a lot of innovative jobs like predicting if a message or an email is a spam or a ham, the quality search that we can do on shopping websites like www.amazon.in and www.flipkart.com in order to search for different categories of items that include kitchen utensils, electronics gadget,apparels, food items and much more such products that are available online. The basic idea was that did anyone ever think of knowing how these search bars or how these hamspam classifications work? The answer to this question is that rarest of the rare people have tried getting into this and tried to know what the mechanism or the back-end work in order to give

such powerful search results and such predictive classification techniques. For those who are not aware of the mechanism behind this, it's all just about playing with strings of characters, numbers and special characters or what we call as string manipulations to arrive at such results.

For example when a product is stored in the database of the online shopping website, what happens is that additional keywords are stored for them such that they can be searched using those keywords. The string input by the customer in the search bar contains keywords using which products are searched and displayed on the customer dashboard. Even the back-end for such applications contains quality search algorithms that are out of the scope of this paper's discussion which is on the model of the descriptive online examination system. Similarly, the scenario is quite the same here for evaluating answers for questions that are descriptive in nature. Keywords are stored for every question and on the basis their occurrence in the answer string, the examinee is allotted marks. In order to perform this in Python language, there exists a library that makes it a little easier for the algorithm developers to perform string manipulations. The name of the library used is NLTK which is specifically designed for python to work on NLP. It is discussed in detail in the section where the algorithm is discussed.

II.LITERATURE SURVEY

1)An automatic classifier for exam questions in Engineering: A process for Bloom's taxonomy
AUTHORS: K. Jayakodi, M. Bhandara and I. Perera

Assessment is an essential activity to achieve the objective of the course being taught and to improve the teaching and learning process. There are several educational taxonomies that can be used to assess the efficacy of assessment in engineering learning by aligning the assessment tasks in line with the intended learning outcomes and teaching and learning activities. This research is focused on using a learning taxonomy that fits well for computer science and engineering to categorize and assign weights to exam questions according to the taxonomy levels. Existing Natural Language Processing (NLP) techniques, Wordnet similarity

algorithms with NLTK and Wordnet package were used and a new set of rules were developed to identify the category and the weight for each exam question according to Bloom's taxonomy. Using the result the evaluators can analyze and design the question papers to measure the student knowledge from various aspects and levels. Prior evaluation was conducted to identify most suitable NLP preprocessing techniques to the context. A sample set of end semester examination questions of the Department of Computer science and Engineering (CSE), University of Moratuwa was used to evaluate the accuracy of the question classification; weight assignment and the main category assignment were validated against the manual classification by a domain expert. The outcome of classification is a set of weights assigned under each taxonomy category, indicating the likelihood of a question to fall into a certain category. The highest weight category was considered as the main category of the exam question. According to the generated rule set the accuracy of detecting the correct main category of a question is 82%.

2)Detection of users suspected of using multiple user accounts and manipulating evaluations in a community site
AUTHORS: N. Ishikawa, K. Umemoto, Y. Watanabe

Some users in a community site abuse the anonymity and attempt to manipulate communications in a community site. These users and their submissions discourage other users, keep them from retrieving good communication records, and decrease the credibility of the communication site. To solve this problem, we conducted an experimental study to detect users suspected of using multiple user accounts and manipulating evaluations in a community site. In this study, we used messages in the data of Yahoo! chiebukuro for data training and examination.

3)Automated Online Exam Proctoring" , IEEE Transactions on Multimedia,
AUTHORS:Y. Atoum, L. Chen, A. X. Liu, S. D. H. Hsu, and X. Liu

This study found journalists use government sites most often to retrieve information. Problems include

difficulty with verification, unreliable information and lack of contact information.

4)Design of Paperless Examination System for Principles of Database Systems
AUTHORS:G. Zhang, and H. Ke

Paperless examination is an important role of modern education, which can effectively reduce the teachers' workload and improve work efficiency. However, the current paperless examination system mainly deals with the objective questions, it is almost impossible to deal with subjective questions such as programming languages, particular in SQL. There is no such practical system as far as know. This article describes a novel SQL-based paperless examination system, including objective questions as well as SQL programming questions.

5)Task Based Automatic Examination System for Sequenced Test
AUTHORS:S. Luo, J. Hu and Z. Chen

Computer greatly influences our educational environment. Over the last years, automatic computer examination systems have been widely used for computer-based tests. But these systems are based on traditional question-answer examination style which is not fit for the sequenced test. The sequenced test should consider the context of the examinee, e.g. the order of questions or the permissions of the examinee, to grade an examinee. In this paper, we propose an effective and practical automatic examination architecture based on task. The task is abstracted from the examination process and can meet the requests of the sequenced test, such as order and dependency. At the end of the paper, we implement an automatic examination system based on task for the stake test which proves quite efficient in practice.

III.IMPLEMENTATION:
MODULES DESCRIPTION:
● Examcell
● student
● Admin
● Python and Data-analysis.
Examcell:
Examcell conducts the exams on particular technologies.first it will store all questions about particular technology into the database.Then store all

answers of every technology into the database.After conducting the exam it will check the student answers with database answers.Finally by using nltk and nlp concept give the result to students.

Student:

The content of it may be overlapping with that of others, but it also has its own discipline characteristics and is constantly developing new theories and methods.

user after login into the session they will choose their particular exam .Then student will write the exam and submit the answers.after clicking test result automatically student will get the result based on their performance.all these concepts i.e getting of student score by using nltk and nlp concepts.

Admin:

Admin will give authority to Exam-cell and students. In order to facilitate activate the Exam Cell and activate the students. the admin can see the details of Exam cell and students.. Admin can see the score of all students..

Python and data-analysis:

Python is an increasingly popular tool for data analysis. In recent years, a number of libraries have reached maturity, allowing R and Stata users to take advantage of the beauty, flexibility, and performance of Python without sacrificing the functionality these older programs have accumulated over the years.python focus on simplicity and readability, python it boasts a gradual and relatively low learning curve. This ease of learning makes an ideal tool for beginning programmers. Python offers programmers the advantage of using fewer lines of code to accomplish tasks than one needs when using older languages.

IV.SCREEN SHOTS:

Home page
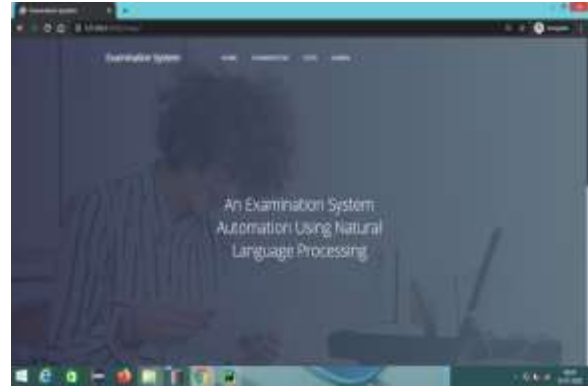
Examination Registration:

Examination login:

Examination Home

View users:

Add Questions:

Add Answers:

Test:

User Registration:

V.CONCLUSION

It can be seen by conducting tests using such an algorithm at regular intervals that one can determine the trend in the marks obtained by different students and we can give them an analyzed report on the different subjects they need to focus on for which they are weak. With the existing data, we can also implement a predictive machine learning model on the data so that it can predict marks that the students will score in the future. It is observed that students mainly study those subjects that are placement oriented or which are required for placement purpose only. While students neglect the subjects of their core domain. Deep knowledge in the domain is required as it is of no use to study if you do not have a core domain knowledge. So it can help students get quality knowledge as everything will be digital and there will be no cumbersome process of conducting a pen-paper test. Also, answers are evaluated at that moment itself and the student can see the solutions and can correct the mistakes or errors committed while appearing for the exam.

FUTURE ENHANCEMENT

The future works on it, it can be tracked using the system that which student has cheated from any other student. This will again use the concepts of Machine Learning and Data Science to work upon these.

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