

1. INTRODUCTION

Computerized and online systems have been increasing in every aspect of education. Information Technology plays a very important role in nowadays education. Computers and internet have made dramatic changes in the education system. Information technology enables institution of high learning to save time, and allow the delivery of education with easiness, anywhere, and anytime. Paper based books are replaced by online and off-line applications. In computer software, it has the availability of accessing the huge databases of information. This gives fundamental change to the education. In the modern era, technological progress has minimized the information in the world. Advancement of technology has many advantages in education and all business industries that use it. Online Examination System for introduction to management is an application that is designed and developed for students and Teachers. The system helps students to take examination. It helps Teachers to upload the questions and answers in the database and they can see the results of the MCQ answers.

Behaviour Analytics along Artificial Intelligence on Online Examination System is a review based analysis on the behaviour of the student during online exam. The dataset included in project contains various attributes and variables in respective to the malpractice, for instance the lip movement, the eye detection and background noise etc, has been included. With the help of project they can easily categorize the students who did malpractice and not. There are many factors that is taken into consideration hence for the examiner they can visualize each and every aspect in decision making and the examiner can easily concentrate in the exam and on the students without any difficulties.

1.1 ABOUT ORGANIZATION

Gateway Software Solutions, Delivery Partner of HP Enterprise, was established a year ago, as an IT Training partner to provide current IT technology as per current IT trend with the staff augmentation & knowledge augmentation is also the motto through our corporate training infrastructure. Our Mission To provide our clients with technical services

having one and only dominant, key property of success: treating 'Quality' as the #1 priority, which apart from providing Success, builds a strong foundation to the business with our Clients. Our endeavour is to delight our Customers with Value-Added solution(s). GATEWAY Software Solutions stands as a "PATH FOR SUCCESS". GATEWAY Software Solutions is a rapidly growing company that provides Job Oriented Training, and Professional IT Services.

Today, Gateway Software Solutions have strong footprint in Coimbatore and are one of the largest and best software companies in Tamilnadu with focus on Java, J2ee, ASP.Net, VB.Net, PHP, SEO, Android, Embedded, Big Data, Cloud and Web Design. They have Software Development office in Coimbatore.

1.2 PROJECT DEFINITION

With the advent of COVID-19, remote learning has blossomed. Schools and universities may have been shut down but they switched to Online Examination System to finish their academic years. Examination system allowing students to give exams from home where they will be monitored by a proctor for the whole duration of the exam. The objective of the project is analysing the behaviour of the student in examination. In online exam the machine itself automatically generate the score and it is secured to save the values. They can predict whether the students are malpracticing or not by using Jupiter notebook. In this Jupiter notebook use some of the machine learning algorithms that is logistic regression. Hence using the results they can compare and determine the Behaviour Analytics along Artificial Intelligence on online Examination System.

1.3 PROJECT OBJECTIVE

The online examination has become primary part in education throughout the world. The main objective of the project is analysing the behaviour in examination using AI. System allows only one login per user, so that user can't do any unfair means and System will capture image of user at every time while entering into the examination. Behaviour

analysis is a method of analysing the students behaviour with the use of past dataset of the exam, like facial expressions, noises around the students, lip movements etc. The project involves the behaviour analysis on students to check whether involving in malpractice or not. The technique that is involved in the project is machine learning algorithm called Logistic Regression.

1.4 PROJECT OVERVIEW

Module Description

1. STUDENT

2. TEACHER

3. ADMIN

1. STUDENT

Lists of sub-modules

A. Authentication

Basic Login, Register,etc.,System allows only one login per user, so that user can't do any unfair means and also System will verify image of user at every time while entering into the examination.

B. Dashboard

In student dashboard displays available exams and total questions.

C. Examination

In examination there are two sub modules are available. That is theory examination and practical examination. In theory examination multiple choice questions are available. In

practical examination compiler is available student can compile their coding's in that. It support for randomize questions and also Support for Calculator for Mathematical type of Exam.

D. My Marks

Students mark is auto generated and marks will be available after the completion of the exam. When submit button is clicked mark will be displayed.

2. TEACHER

List of sub-modules

A. Authentication

When teacher is register, their request will be sent to admin. After admin accept the request then only teacher can login into their profile.

B. Dashboard

In the teacher dashboard, displays registered students, total teachers, total courses and available questions.

C. Manage Course

In manage course, there are two sub-modules are available. That are add courses and view courses. In add course, course details are added that are course name, total marks for the examination and total questions for the examination. In view course, course details are viewed and teacher can also delete the course

D. Manage Questions

In manage question, there are two sub-modules are available. That are add questions and view questions. In add questions, they have to give course name, MCQ question, add marks

to the particular questions, options and also correct answer where the marks are auto generated. In view questions, questions added the teacher can the questions based on the course name and also teacher can delete the particular question, question cannot be deleted during examination.

3. ADMIN

List of sub-modules

A. Authentication

Admin login is a background process that is done by using command .To login as an admin first they have to give username and password. Then admin has been created and they can create the user.

B. Dashboard

In admin dashboard displays, registered students, total teacher, total courses, total questions and data analysis.

C. Data Analysis

I. Data collection

The first phase is to collect the data that are interested in collecting for pre-processing and to apply prediction and machine learning methods. Data pre-processing is a data mining technique that involves transforming raw data into an understandable format. Real world data is often incomplete, inconsistent, and lacking certain to contain many errors. Data pre-processing is a proven method of resolving such issues. Data pre-processing prepares raw data for further processing. For pre-processing they have used standardization method to pre-process the CSV dataset. This step is very important because the quality and quantity of data that you gather will directly determine how good predictive model can be.

II. Data acquisition

Data Preparation, where they load data into a suitable place and prepare it for use in machine learning training. First put all data together, and then randomize the ordering.

III. Pre-processing the data

In machine learning and statistics, feature selection, also known as variable selection, attribute selection, is the process of selecting a subset of relevant features for use in model construction.

IV. Classification using Logistic Regression

Logistic regression is one of the most popular Machine Learning algorithms, which comes under the Supervised Learning technique. It is used for predicting the categorical dependent variable using a given set of independent variables. Logistic regression predicts the output of a categorical dependent variable. Therefore the outcome must be a categorical or discrete value. It can be either Yes or No, 0 or 1, true or False, etc. but instead of giving the exact value as 0 and 1, it gives the probabilistic values which lie between 0 and 1. Logistic Regression is much similar to the Linear Regression except that how they are used. Linear Regression is used for solving Regression problems, whereas Logistic regression is used for solving the classification problems. Logistic Regression is a significant machine learning algorithm because it has the ability to provide probabilities and classify new data using continuous and discrete datasets.

ALGORITHM

Step 1: Load the data

In this step, pre-process/prepare the data so that can use it in classification.

Step 2: Logistic Regression Logic

Logistic regression predicts the output of a categorical dependent variable. Therefore the outcome must be a categorical or discrete value. It can be either Yes or No, 0 or 1, true or False, etc. but instead of giving the exact value as 0 and 1, it gives the probabilistic values which lie between 0 and 1.

Step 3: Extraction of data

Extract the dependent and independent variables from the given dataset using iloc function. Then split the data into training set and test set. Here they only scale the independent variable because dependent variable have only 0 and 1 values.

Step 4: Fitting Logistic Regression to the Training set:

The well prepared dataset, and now it is ready to train the dataset using the training set. For providing training or fitting the model to the training set, import the **LogisticRegression** class of the **sklearn** library and create a classifier object and use it to fit the model to the logistic regression.

Step 5: Predicting the Test Result

Model is well trained on the training set, so now predict the result by using test set data and created an y_pred vector to predict the test set result.

Step 6: Test Accuracy of the result

Now, create the confusion matrix here to check the accuracy of the classification. To create it, need to import the confusion matrix function of the sklearn library. The confusion matrix provides us a matrix/table as output and describes the performance of the model. The matrix consists of predictions result in a summarized form, which has a total number of correct predictions and incorrect predictions.

Step 7: Visualizing the training set result

Visualize the training set result. To visualize the result, use heatmap class of matplotlib library.

Step 8: Report is generated

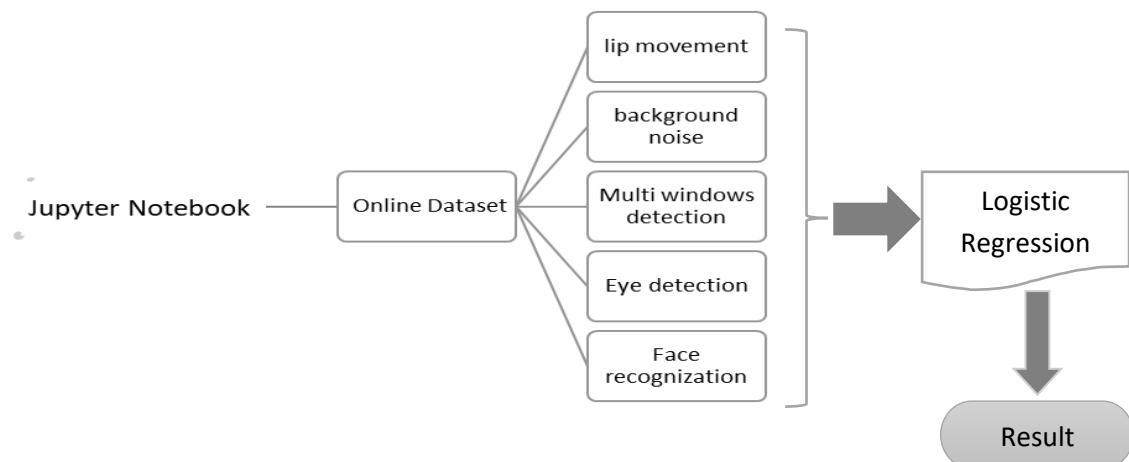
```
In [524]: confusion_matrix = pd.crosstab(y_test, y_pred, rownames=['Actual'])
sns.heatmap(confusion_matrix, annot=True)
```

```
print('Accuracy: ', metrics.accuracy_score(y_test, y_pred))
plt.show()
```

```
Accuracy: 0.676
```



Flow Chart



Dataset

The screenshot shows an Excel spreadsheet with the following structure:

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | | |
|----|---------------|-----------|------|-------------------|----------|-----------|----------|-----------|-----------|------------|-----------|------------|-----------|-----------|-------------------------|-------------------------|-------------------------|---|---|--|--|
| 1 | Student_ID | Subject | Year | Text_DeteSpeech_D | Phone_De | Active_Wi | Lip_Move | Face_Recc | Eye_Detec | Background | Multi-Win | malpractic | Attempt_L | College_N | | | | | | | |
| 2 | 2019MBA:CS001 | Marketing | 2020 | 2 | 1 | 2 | 2 | 1 | normal | normal | speech | 1 | 1 | 2 | King management studies | | | | | | |
| 3 | 2019MBA:CS002 | DBMS | 2020 | 2 | 3 | 2 | 1 | 1 | 1 | movemen | right | burp | 1 | 2 | 2 | Rhythm B Schools | | | | | |
| 4 | 2019MBA:CS002 | DBMS | 2020 | 1 | 1 | 1 | 3 | 3 | normal | left | chair mov | 2 | 2 | 1 | Rhythm B Schools | | | | | | |
| 5 | 2019MBA:CS002 | DBMS | 2020 | 2 | 3 | 2 | 1 | 1 | movemen | normal | door knoc | 1 | 2 | 2 | Rhythm B Schools | | | | | | |
| 6 | 2019MBA:CS002 | DBMS | 2020 | 1 | 1 | 1 | 3 | 3 | normal | right | open/clos | 3 | 2 | 1 | Rhythm B Schools | | | | | | |
| 7 | 2019MBA:CS002 | DBMS | 2020 | 3 | 3 | 2 | 1 | 1 | 1 | movemen | left | drink | 1 | 2 | 2 | Rhythm B Schools | | | | | |
| 8 | 2019MBA:CS002 | DBMS | 2020 | 1 | 1 | 1 | 1 | 3 | normal | normal | gasp | 3 | 2 | 1 | Rhythm B Schools | | | | | | |
| 9 | 2019MBA:CS002 | DBMS | 2020 | 3 | 1 | 1 | 2 | 1 | 1 | movemen | right | phone rinj | 1 | 1 | 3 | Rhythm B Schools | | | | | |
| 10 | 2019MBA:CS001 | Marketing | 2020 | 1 | 2 | 3 | 2 | 2 | 3 | normal | left | silence | 1 | 1 | 1 | King management studies | | | | | |
| 11 | 2019MBA:CS001 | Marketing | 2020 | 1 | 2 | 1 | 2 | 1 | 1 | movemen | normal | paper mo | 2 | 1 | 3 | King management studies | | | | | |
| 12 | 2019MBA:CS001 | Marketing | 2020 | 2 | 2 | 3 | 2 | 1 | 1 | normal | right | speech | 2 | 1 | 1 | King management studies | | | | | |
| 13 | 2019MBA:CS002 | DBMS | 2020 | 2 | 2 | 1 | 2 | 2 | 2 | movemen | left | burp | 2 | 1 | 1 | Rhythm B Schools | | | | | |
| 14 | 2019MBA:CS002 | DBMS | 2020 | 2 | 2 | 3 | 2 | 2 | 2 | normal | normal | chair mov | 2 | 1 | 2 | Rhythm B Schools | | | | | |
| 15 | 2019MBA:CS001 | Marketing | 2020 | 2 | 2 | 1 | 1 | 1 | 2 | movemen | right | door knoc | 2 | 1 | 2 | King management studies | | | | | |
| 16 | 2019MBA:CS001 | Marketing | 2020 | 2 | 1 | 1 | 1 | 1 | 2 | normal | left | open/clos | 2 | 1 | 2 | Rhythm B Schools | | | | | |
| 17 | 2019MBA:CS001 | Marketing | 2020 | 2 | 1 | 2 | 1 | 2 | 2 | movemen | normal | drink | 1 | 1 | 2 | Rhythm B Schools | | | | | |
| 18 | 2019MBA:CS002 | DBMS | 2020 | 1 | 1 | 2 | 2 | 2 | 2 | normal | right | gasp | 1 | 2 | 2 | King management studies | | | | | |
| 19 | 2019MBA:CS002 | DBMS | 2020 | 1 | 2 | 2 | 1 | 1 | 1 | normal | left | door knoc | 1 | 1 | 2 | Rhythm B Schools | | | | | |
| 20 | 2019MBA:CS002 | DBMS | 2020 | 1 | 1 | 2 | 2 | 2 | 1 | movemen | normal | open/clos | 2 | 2 | 1 | Rhythm B Schools | | | | | |
| 21 | 2019MBA:CS002 | DBMS | 2020 | 2 | 2 | 2 | 2 | 1 | 1 | normal | normal | drink | 1 | 1 | 1 | King management studies | | | | | |
| 22 | 2019MBA:CS001 | Marketing | 2020 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | movemen | right | gasp | 2 | 2 | 1 | King management studies | | | | |

D. Teacher Section

In teacher section, there are three sub modules they are approved teacher, pending teacher and teacher's salary. In approved teacher, admin can view teacher profile after approval from them, they can edit and delete their profile. In pending teacher, request given by the teacher after registration, that should be accept by the admin. In teacher's salary, it displays the salary of individual teachers.

E. Student Section

In student section, there are two sub modules they are registered students and student marks. In registered students, they can view registered students profile and they can also edit and delete profile. In student marks, admin can view the marks of each students in particular courses.

F. Manage Course

In manage course, there are two sub-modules are available. That are add courses and view courses. In add course, course details are added that are course name, total marks for the examination and total questions for the examination. In view course, course details are viewed and they can also delete the course.

G. Manage Questions

In manage question, there are two sub-modules are available. That are add questions and view questions. In add questions, they have to give course name, MCQ question, add marks to the particular questions, options and also correct answer where the marks are auto generated. In view questions, questions added the teacher can the questions based on the course name and also they can delete the particular question, question cannot be deleted during examination.

2. SYSTEM SPECIFICATION

2.1 HARDWARE SPECIFICATION

PROCESSOR : Intel®i5 8th Gen

HARD DISK CAPACITY : 500GB

RAM : 4GB DDR3 minimum

KEYBOARD : 105 KEYS

MOUSE DEVICE : Compatible pointing

2.2 SOFTWARE SPECIFICATION

OPERATING SYSTEM : Windows 10

SOFTWARE TOOLS : Visual Studio

FRONT END : HTML, JS, CSS

PROGRAMMING LANGUAGES: Django (version: 3.2.)

TOOL : Jupyter Notebook

2.3 SOFTWARE DESCRIPTION

MACHINE LEARNING

Machine learning is a branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy.

Machine learning is an important component of the growing field of data science. Through the use of statistical methods, algorithms are trained to make classifications or predictions, uncovering key insights within data mining projects. These insights subsequently drive decision making within applications and businesses, ideally impacting key growth metrics. As big data continues to expand and grow, the market demand for data scientists will increase, requiring them to assist in the identification of the most relevant business questions and subsequently the data to answer them.

PYTHON

Python is an easy to learn, powerful programming language. It has efficient high-level data structures and a simple but effective approach to object-oriented programming. Python's elegant syntax and dynamic typing, together with its interpreted nature, make it an ideal language for scripting and rapid application development in many areas on most platforms. The Python interpreter and the extensive standard library are freely available in source or binary form for all major platforms. Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages. Python can be used on a server to create web applications. Python works on different platforms (Windows, Mac, Linux, Raspberry Pi, etc.) Python can connect to database systems. It can also read and modify files.

Python is Interpreted – Python is processed at runtime by the interpreter. You do not need to compile your program before executing it. This is similar to PERL and PHP.

Python is Interactive – can actually sit at a Python prompt and interact with the interpreter directly to write your programs.

Python is Object-Oriented – Python supports Object-Oriented style or technique of programming that encapsulates code within objects.

Python is a Beginner's Language – Python is a great language for the beginner-level programmers and supports the development of a wide range of applications from simple text processing to WWW browsers to games.

Python is derived from many other languages, including ABC, Modula-3, C, C++, Algol-68, Small Talk, and Unix shell and other scripting languages.

Python 3.0 was released on 3 December 2008. It was a major revision of the language that is not completely backward-compatible. Many of its major features were back ported to Python 2.6.x and 2.7.x version series. Releases of Python 3 include the 2to3 utility, which automates (at least partially) the translation of Python 2 code to Python 3.

Python 2.7's end-of-life date was initially set at 2015 then postponed to 2020 out of concern that a large body of existing code could not easily be forward-ported to Python 3.

Python is a multi-paradigm programming language. Object-oriented programming and structured programming are fully supported, and many of its features support functional programming and aspect-oriented programming (including by metaprogramming and metobjects (magic methods)). Many other paradigms are supported via extensions, including design by contract and logic programming.

Python uses dynamic typing and a combination of reference counting and a cycle-detecting garbage collector for memory management. It also features dynamic name resolution (late binding), which binds method and variable names during program execution.

Python's design offers some support for functional programming in the Lisp tradition. It has filter, map, and reduce functions; list comprehensions, dictionaries, sets, and generator expressions. The standard library has two modules (interools and functions) that implement functional tools borrowed from Haskell and Standard ML.

Rather than having all of its functionality built into its core, Python was designed to be highly extensible. This compact modularity has made it particularly popular as a means of adding

programmable interfaces to existing applications. Van Rossum's vision of a small core language with a large standard library and easily extensible interpreter stemmed from his frustrations with ABC, which espoused the opposite approach.

DJANGO

Django is a Python-based free and open-source web framework that follows the model–template–views (MTV) pattern. It is maintained by the Django Software Foundation (DSF), an American independent organization established as a 501(c)(3) non-profit.

Django's primary goal is to ease the creation of complex, database-driven websites. The framework emphasizes reusability and "pluggability" of components, less code, low coupling, rapid development, and the principle of don't repeat yourself. Python is used throughout, even for settings, files, and data models. Django also provides an optional administrative create, read, update and delete interface that is generated dynamically through introspection and configured via admin models.

Some well-known sites that use Django include Instagram, Mozilla, Disqus, Bitbucket, Nextdoor and Clubhouse.

LOGISTIC REGRESSION

Logistic regression is one of the most popular Machine Learning algorithms, which comes under the Supervised Learning technique. It is used for predicting the categorical dependent variable using a given set of independent variables. Logistic regression predicts the output of a categorical dependent variable. Therefore the outcome must be a categorical or discrete value. It can be either Yes or No, 0 or 1, true or False, etc. but instead of giving the exact value as 0 and 1, it gives the probabilistic values which lie between 0 and 1. Logistic Regression is much similar to the Linear Regression except that how they are used. Linear Regression is used for solving Regression problems, whereas Logistic regression is used for solving the classification problems. In Logistic regression, instead of fitting a regression line, fit an "S" shaped logistic function, which predicts two maximum values (0 or 1). The curve

from the logistic function indicates the likelihood of something such as whether the cells are cancerous or not, a mouse is obese or not based on its weight, etc. Logistic Regression is a significant machine learning algorithm because it has the ability to provide probabilities and classify new data using continuous and discrete datasets. Logistic Regression can be used to classify the observations using different types of data and can easily determine the most effective variables used for the classification.

JUPYTER NOTEBOOK

Project Jupyter is a non-profit, open-source project, born out of the IPython Project in 2014 as it evolved to support interactive data science and scientific computing across all programming languages. Jupyter will always be 100% open-source software, free for all to use and released under the liberal terms of the modified BSD license.

Jupyter is developed in the open on GitHub, through the consensus of the Jupyter community. For more information on our governance approach, please see our Governance Document.

All online and in-person interactions and communications directly related to the project are covered by the Jupyter Code of Conduct. This Code of Conduct sets expectations to enable a diverse community of users and contributors to participate in the project with respect and safety.

3. SYSTEM STUDY

3.1 Existing System

The whole process of assigning test and evaluating their scores after the test, was done manually till date. Processing the test paper i.e. checking and distributing respective scores used to take time when the software was not installed. Since the traditional have many drawbacks such as time consuming, Difficulty of analysing the test manually, More observers are required to take exam of many students, Results are not accurate since calculations is done manually, The chance of losing exam's result is higher in current systems, Checking of result is time consuming since it done manually, Limitation of no of student can give examination at a time. With the development of information technology and use it in an orderly and properly helps to overcome the existing error in the manual system. Online examination system saves the exams information in a database, and this make it an easier way to give exam teachers can add theirs exams rules, and student can give exam in a totally automated system.

Disadvantages of Current System

- The current system is very time consuming.
- To take exam of more candidates more invigilators are required but no need of invigilator in case of online examination.
- The chances of paper leakage are more in current system as compared to proposed system.
- Result processing takes more time as it is done manually.

3.2 Proposed System

In this work, the aim is to develop an analysis to detect a wide variety of cheating behaviours in an online exam session. In proposed online exam process includes two phases, the preparation phase and exam phase.

Advantages

- In the preparation phase, the test taker has to authenticate himself before beginning

the exam, by using a Login authentication.

- The test taker should not leave the room during the exam phase.
- Marks will be generated automatically for MCQ's
- Practical exams can also be conducted in this portal.
- The proposed system analyse the online examination using the artificial intelligence system and find out the malpractice of the online examination.
- The Text detection, eye detection, background noise detection parameters are analysed and machine learning is applied to find out the malpractice accurately.
- The data analysis provides the best analytics to find out the malpractices in the online examination

4. SYSTEM DESIGN

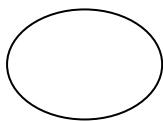
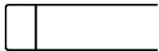
System design is "the process of studying a procedure or business in order to identify its goals, purposes and create systems and procedures that will achieve them in an efficient way". Another view sees system analysis as a problem-solving technique that breaks down a system into its component pieces for the purpose of the studying how well those component parts work and interact to accomplish their purpose.

4.1 Dataflow Diagram (DFD)

A data-flow diagram (DFD) is a way of representing a flow of a data of a process or a system (usually an information system). DFD also provides information about the outputs and inputs of each entity and the process itself. A data-flow diagram has no control flow, there are no decision rules and no loops. Specific operations based on the data can be represented by a flowchart. The data-flow diagram is part of the structured-analysis modelling tools. When using UML, the activity diagram typically takes over the role of the data-flow diagram. A special form of data-flow plan is a site- oriented data-flow plan.

Notations

| Symbol | Name | Description |
|---|-----------------|---|
|  | External Entity | Also known as actors, sources or sinks, and terminators, external entities produce and consume data that flows between the entity and the system being diagrammed. These data flows are the inputs and outputs of the DFD. Since they are external to the system being analyzed, these entities are typically placed at the boundaries of the diagram. They can represent another system or indicate a subsystem. |

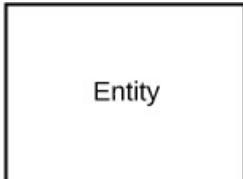
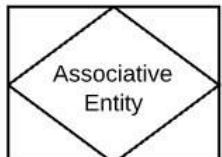
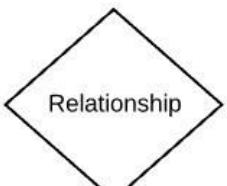
| | | |
|---|------------|---|
|  | Process | An activity that changes or transforms data flows. Since they transform incoming data to outgoing data, all processes must have inputs and outputs on a DFD |
|  | Data store | A data store does not generate any operations but simply holds data for later access. Data stores could consist of files held long term or a batch of documents stored briefly while they wait to be processed. Input flows to a data store include information or operations that change the stored data. Output flows would be data retrieved from the store. |
|  | Data flow | Movement of data between external entities, processes and data stores is represented with an arrow symbol, which indicates the direction of flow. This data could be electronic, written or verbal. Input and output data flows are labelled based on the type of data or its associated process or data store, and this name is written alongside the arrow. |

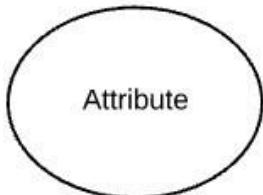
REFER APPENDIX A FOR DFD DIAGRAM

4.2 ENTITY RELATIONSHIP DIAGRAM

An entity relationship diagram (ERD), also known as an entity relationship model, is a graphical representation of an information system that depicts the relationships among people, objects, places, concepts or events within that system. An ERD is a data modelling technique that can help define business processes and be used as the foundation for a relational database.

NOTATIONS

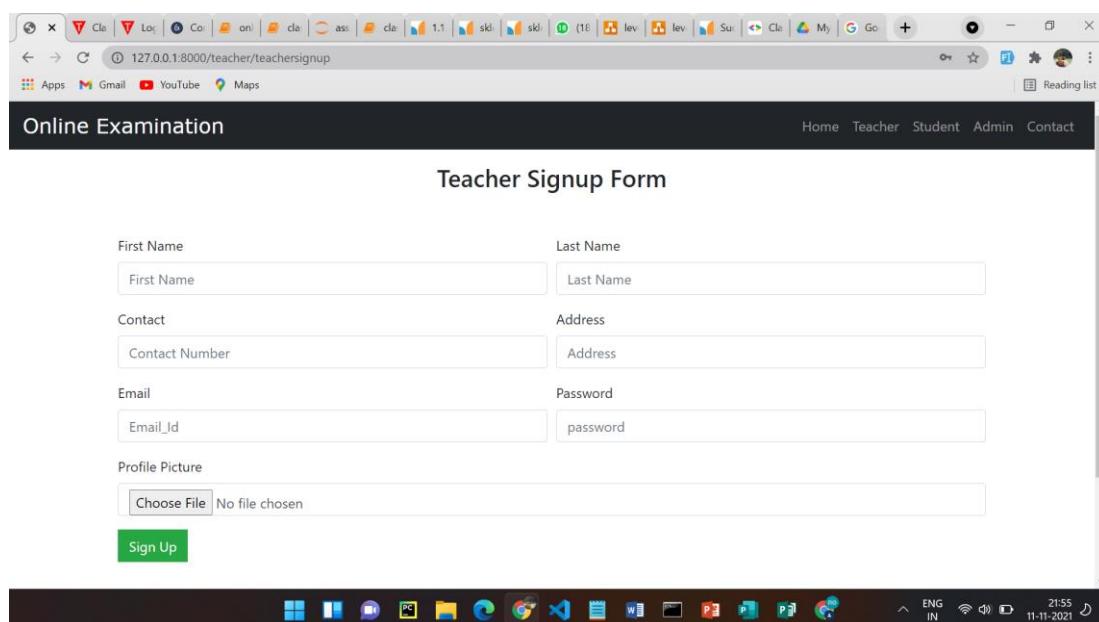
| Entity Symbol | Name | Description |
|---|--------------------|--|
|  | Strong entity | These shapes are independent from other entities, and are often called parent entities, since they will often have weak entities that depend on them. They will also have a primary key, distinguishing each occurrence of the entity. |
|  | Associative entity | Associative entities relate the instances of several entity types. They also contain attributes specific to the relationship between those entity instances |
|  | Relationship | Relationships are associations between or among entities |

| | | |
|---|------------------|--|
|  | Attribute | Attributes are characteristics of an entity, a many-to- many relationship, or a one-to-one relationship. |
|---|------------------|--|

REFER APPENDIX B FOR ER DIAGRAM

4.3 INPUT DESIGN

Input design is one of the most important system design phases. Input design is the process where. The input received in the system are planned and designed, so as to get only necessary information from the user, eliminating the information that is not required. The aim of the input design is to ensure the maximum possible levels of accuracy and to make data entry easier and to be free from errors



The screenshot shows a web browser window with the URL 127.0.0.1:8000/teacher/teachersignup. The page title is "Online Examination". The main content is a "Teacher Signup Form" with the following fields:

- First Name: Two input fields for First Name and Last Name.
- Contact: Two input fields for Contact Number and Address.
- Email: Two input fields for Email_Id and password.
- Profile Picture: A file input field labeled "Choose File" with the message "No file chosen".
- A green "Sign Up" button at the bottom.

4.4 DATABASE DESIGN

Database is designed to manage large bodies of information. The management of data involves both the definitions of structure for the storage of information. In addition, the database system must provide the safety of the information, despite system crashes or due to attempts at unauthorized access. For developing an efficient database user have to fulfill certain conditions such as controlled redundancy.

Data Constraints

All business in the world runs on business data being gathered, stored and analyzed.

Types of Data Constraints

There are two types of data constraints that can be applied to data being inserted into a database table. One type of constraint is called I/O constraint. The other type of constraint is called a business rule constraint.

I/O Constraints

The input /output data constraint is further divided into two distinctly different constraints.

The Primary Key Constraint

Here the data constraint attached to a column ensures:

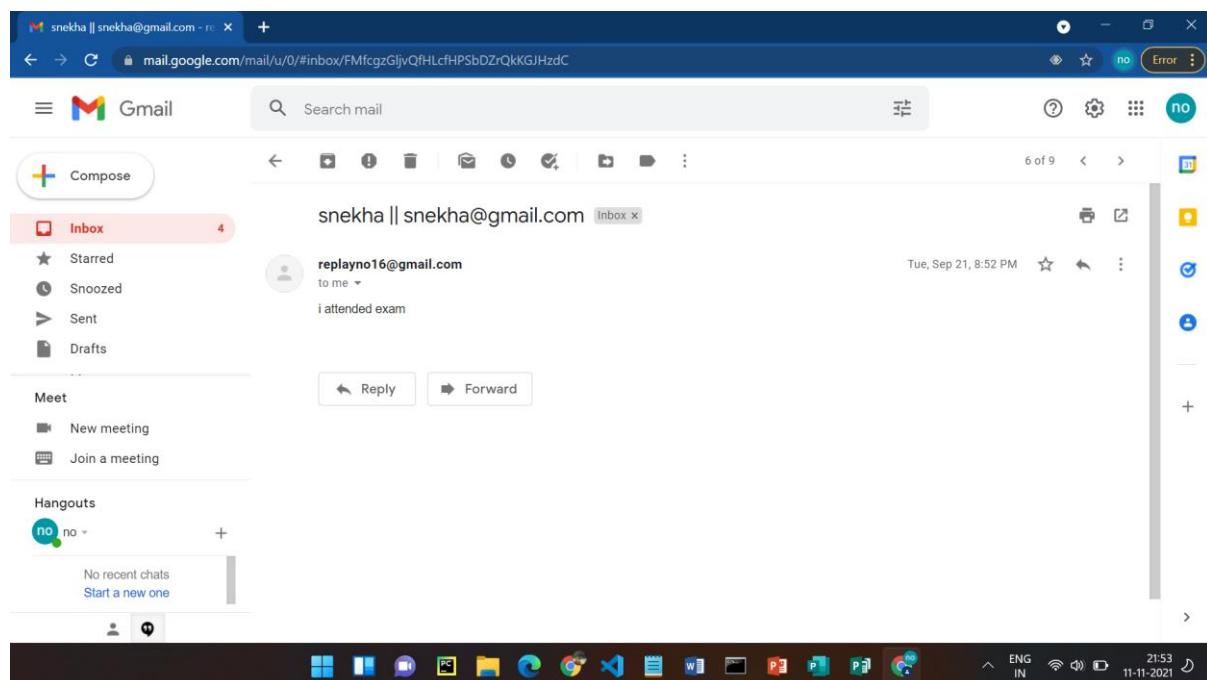
- That the data entered in the table column is unique across the entire column.
- That none of the cells belonging to the table column are left empty.

REFER APPENDIX C FOR DATABASE DESIGN

4.5 OUTPUT DESIGN

One of the most important factors of the system is the output it produces. Output refers to the results and information that is generated by the system. Basically, the output from a computer system is used to communicate the result of the processing to the user. Output design is the process that involves designing necessary outputs which helps the user according to their requirements. Efficient output design should improve the system relationship with the user and help in decision-making.

Output of the computer is the most important and direct source of information to the user. Output design should improve the system in relationship with the user help in decision-making. Once the output document can be carried out a major form of output is the hand copy from the printer or writing the data into the file in a specified format.



5. SYSTEM TESTING

Testing is vital to the success of the system. System testing makes a logical assumption that if all parts of the system are correct, the goal will be successfully achieved. In the testing process we test the actual system in an organization and gather errors from the new system operates in full efficiency as stated. System testing is the stage of implementation, which is aimed to ensuring that the system works accurately and efficiently. In the testing process test the actual system in an organization and gather errors from the new system and take initiatives to correct the same. All the front-end and back-end connectivity are tested to be sure that the new system operates in full efficiency as stated. System testing is the stage of implementation, which is aimed at ensuring that the system works accurately and efficiently.

The main objective of testing is to uncover errors from the system. For the uncovering process they have to give proper input data to the system. So they should have more conscious to give input data. It is important to give correct inputs to efficient testing. Testing is done for each module. After testing all the modules, the modules are integrated and testing of the final system is done with the test data, specially designed to show that the system will operate successfully in all its aspects conditions. Thus the system testing is a confirmation that all is correct and an opportunity to show the user that the system works. Inadequate testing or non-testing leads to errors that may appear few months later. This will create two problems time delay between the cause and appearance of the problem. The effect of the system errors on files and records within the system. The purpose of the system testing is to consider all the likely variations to which it will be suggested and push the system to its limits. The testing process focuses on logical intervals of the software ensuring that all the statements have been tested and on the function intervals (i.e.,) conducting tests to uncover errors and ensure that defined inputs will produce actual results that agree with the required results.

5.1 UNIT TESTING

Unit testing verification efforts on the smallest unit of software design, module. This is known as “Module Testing”. The modules are tested separately. This testing is carried out during programming stage itself. In these testing steps, each module is found to be working satisfactorily as regard to the expected output from the module.

| TEST CASE ID | TEST DESCRIPTION | EXPECTED RESULT | ACTUAL RESULT | RESULT |
|--------------|--|--|--|--------|
| TC001 | Administrator Login Check name and password | If name and password fields are correct | Redirect to Administrator page | PASS |
| | | If name and password fields are incorrect | Error message should be displayed. Shown in figure (Fig D27. Test case for Admin Login) | FAIL |
| TC002 | Teacher/ Student Check member email and password | If email and password fields are correct shown in figure | User should login into a page | PASS |
| | | If email and password fields are incorrect | User should not login into a page, page get refresh and have to enter correct email and password | FAIL |

5.2 INTEGRATION TESTING

Integration testing is a systematic technique for constructing tests to uncover error associated

Within the interface. In the project, all the modules are combined and then the entire programmer is tested as a whole. In the integration-testing step, all the error uncovered is corrected for the next testing steps.

5.3 VALIDATION TESTING

To uncover functional errors i.e., to check whether functional characteristics confirm to specification or not.

5.4 ACCEPTANCE TESTING

At last the system is delivered to the user for acceptance testing. Normally this type of testing is done to verify if the system meets the specified requirements. User does this testing to determine whether to accept application.

6. SYSTEM IMPLEMENTATION AND MAINTAINANCE

Implementation is the stage of the project when the theoretical design is turned out into a working system. Thus it can be considered to be the most critical stage in achieving a successful new system and in giving the user, confidence that the new system will work and be effective. The implementation stage involves careful planning, investigation of the existing system and its constraints on implementation, designing of methods to achieve changeover and evaluation of changeover methods. Implementation is the process of converting a new system design into operation. It is the phase that focuses on user training, site preparation and file conversion for installing a candidate system. The important factor that should be considered here is that the conversion should not disrupt the functioning of the organization. Implementation is the stage in the project where the theoretical design is turned into a working system. The most crucial stage is achieving a successful new system & giving the user confidence in that the new system will work efficiently & effectively in the implementation state. The stage consists of:

- Testing the developed program with simple data.
- Detection's and correction of error.
- Creating whether the system meets user requirements.
- Testing whether the system.
- Making necessary changes as desired by the user.
- Training user personnel.

7. CONCLUSION

This project incorporates all the requirements. In this paper, it deeply study the online learning behaviour and build the student profile with big data processing technology. It calculates the similarity of student's behaviour and use the Logistics Regression algorithm to classify the student's malpractices. Finally, the student profile has been established as well as visual analysis. It confirm that Machine Learning course requires definite human-computer interaction behaviour could be studied, which seems to be a broad and demanding area, requiring experimental approach. Since the use of Machine Learning can Analysis the behaviour of students malpractices during Online Examination and with the use of our project the Malpractices can be effectively reduced. Finally, the live recording of the video and immediate status detection makes this project unique and peculiar. The project mainly depends on the data to give a result with accuracy. The possibilities and performance of cheating-related anomaly detection and classification automation, for which machine learning techniques are central, seems beneficial. The behavioural cheating such as audio-visual analysis of voice, background sounds, facial gestures, gaze or movements through web camera and microphone. The use of Machine Learning for recognition systems has the aim of increasing human comfort and security in the scope of personal privacy and in a wider scope such as for an agency. The students malpractices also be find out using technical development and it contains many dis-advantages compared to traditional systems which affords the students' knowledge and it reduce the interest towards learning.

8. SCOPE OF FUTURE ENHANCEMENT

In future, this project can be enhanced further which can increase the applicability and usage in this system. The development process of this system can be easily followed by adding new features to this application. More functionality can be added depending upon the requirements and specification. Implementation of auto monitoring will very effective, examination can be conducted in absence of invigilator at the background of online examination, Monitored logs can be stored in the dataset for prediction. In the future work, proceed the exam with the validation of the student's face in comparison with the face ids available in the database, which is stored while the registration of the student takes place.

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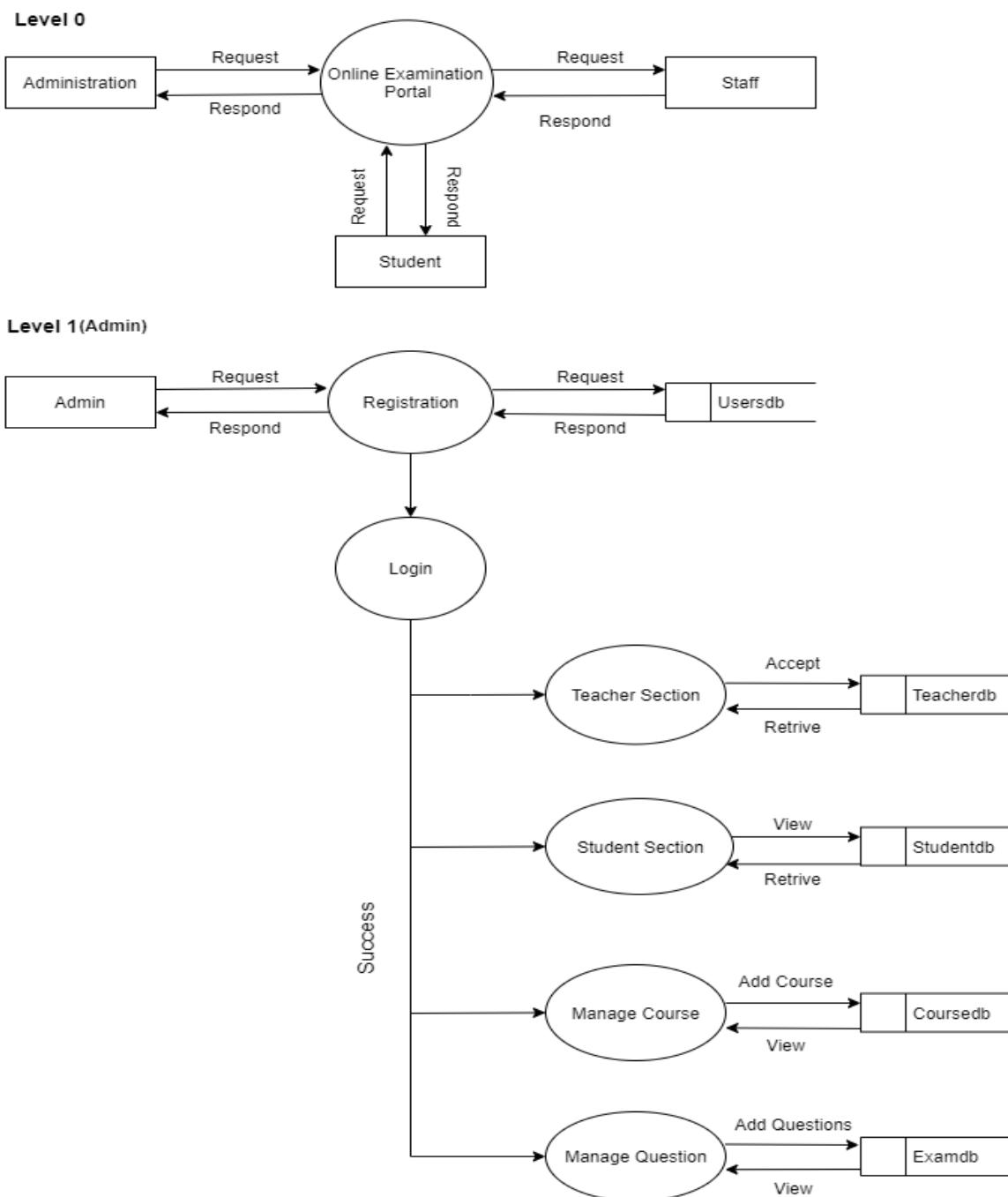
1. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, 2nd Edition Paperback – 27 October 2017 by William McKinney (Author)
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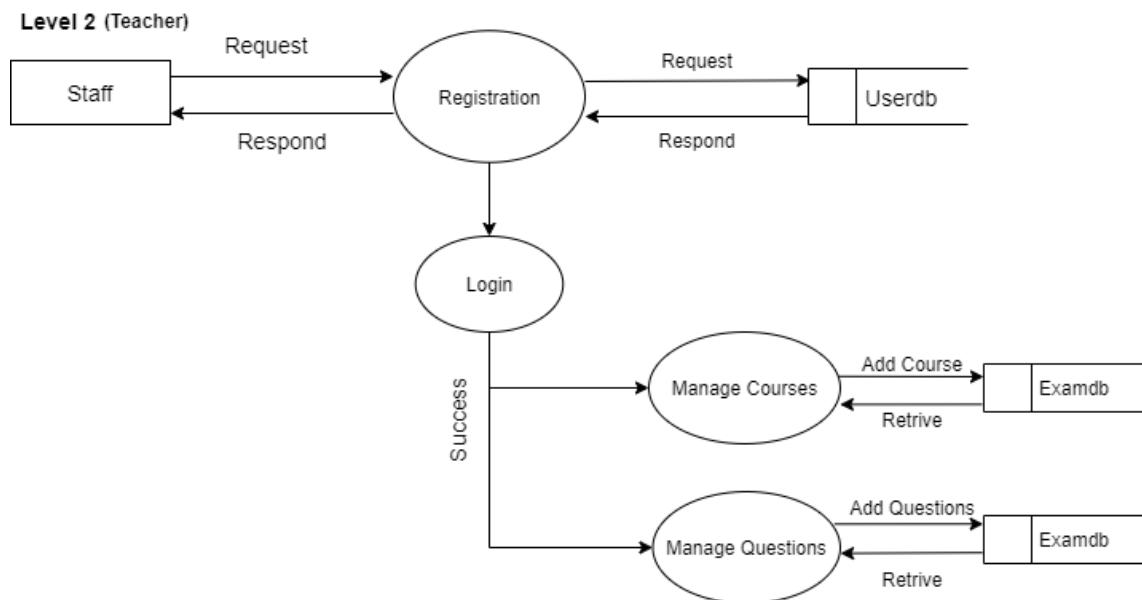
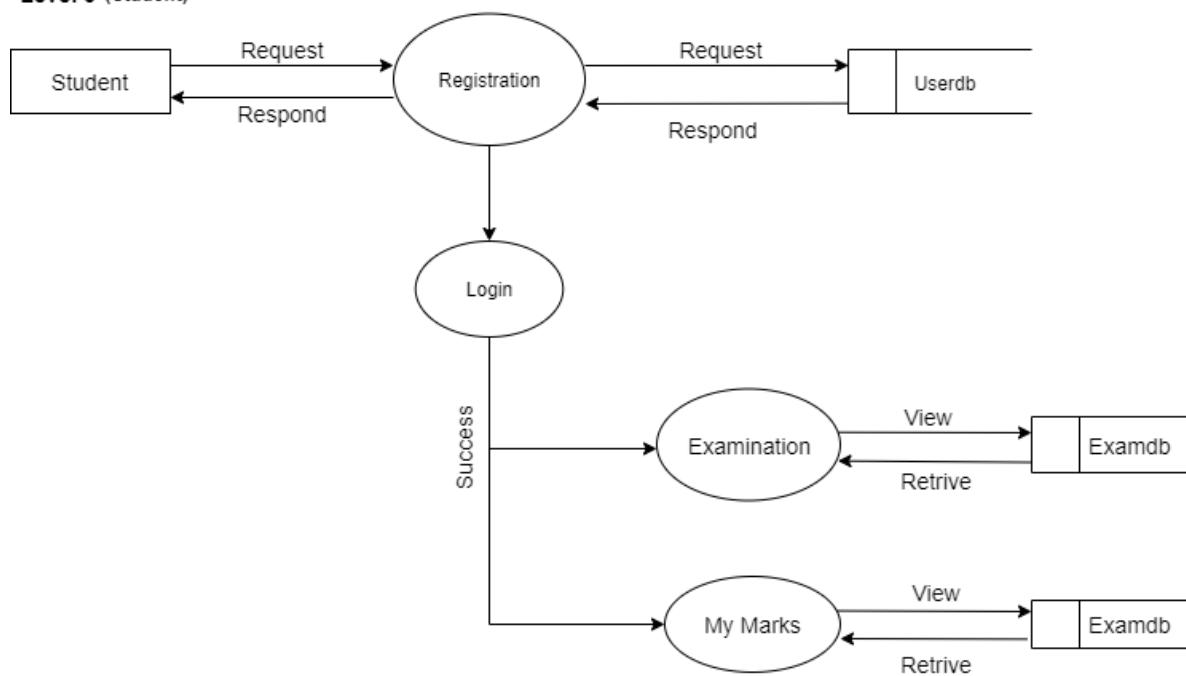
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1. <https://getbootstrap.com/>
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4. <https://docs.djangoproject.com/en/3.2/>
5. <https://www.python.org/>

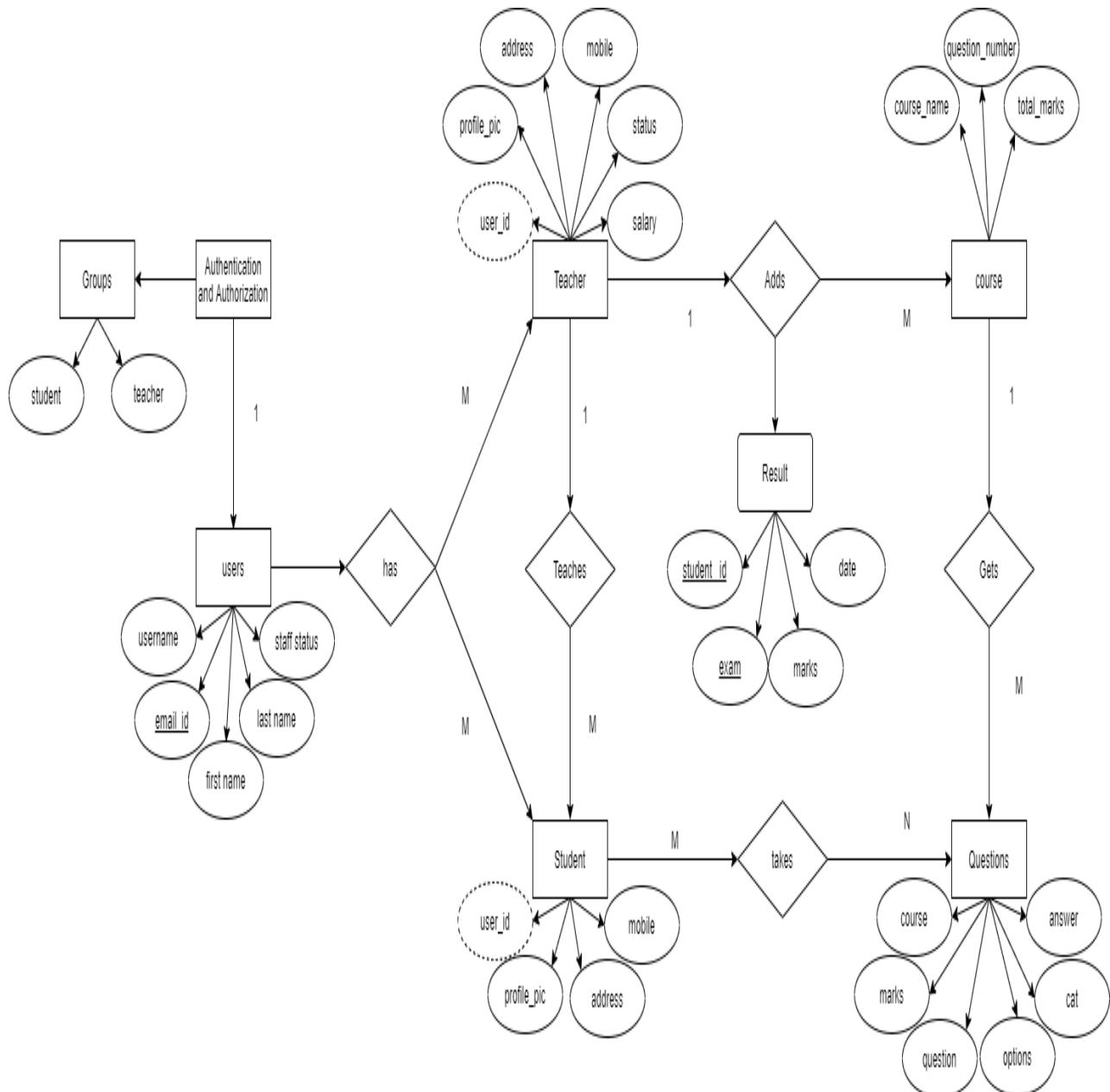
APPENDIX

A. Data Flow Diagram



**Level 3 (Student)**

B. ER Diagram



C. Database Design

Table Name: Course.db

| Field | DataType | Constraints | Description |
|-----------------|----------------------|-------------|-----------------------------|
| course_name | CharField(10) | Not null | Name of the Course |
| question_number | PositiveIntegerField | Not null | Number of the question |
| total_marks | PositiveIntegerField | Not null | Total Marks for the Subject |

Table Name: Questiondb

| Field | DataType | Constraints | Description |
|----------|----------------------|----------------------|-------------------------------|
| Course | CharField(20) | Not null, Foreignkey | Name of the Course |
| Marks | PositiveIntegerField | Not null | Marks for each question |
| question | CharField(10) | Not null | Questions |
| option1 | CharField(10) | Not null | Option1 for the MCQ questions |
| option3 | CharField(10) | Not null | Option1 for the MCQ questions |
| option4 | CharField(10) | Not null | Option1 for the MCQ questions |

| | | | |
|---------|---------------|----------|-------------------------------|
| option2 | CharField(10) | Not null | Option1 for the MCQ questions |
| answer | CharField(30) | Not null | Answer for the question |

Table Name: Resultdb

| Field | DataType | Constraints | Description |
|---------|----------------------|----------------------|-------------|
| student | CharField(10) | Not null, Foreignkey | Student |
| Exam | CharField | Not null, Foreignkey | Exam |
| Marks | PositiveIntegerField | Not null | Total Marks |
| Date | DateTimeField | Not null | Date |

Table Name: Studentdb

| Field | DataType | Constraints | Description |
|------------|---------------|----------------------|-------------|
| user_id | OneToOneField | Not null, PrimaryKey | Student |
| profile_pc | ImageField | Not null | Exam |
| address | CharField(10) | Not null | Total Marks |
| mobile | CharField(10) | Not null | Date |

Table Name: Teacherdb

| Field | DataType | Constraints | Description |
|-------------|----------------------|---------------------|---------------------------|
| user_id | OneToOneField | Not null,PrimaryKey | User Name |
| profile_pic | ImageField | Not null | To upload profile picture |
| address | CharField(20) | Not null | Address |
| mobile | CharField(25) | Not null | Mobile Number |
| status | BooleanField | Not null | Status(Student/Teacher) |
| salary | PositiveIntegerField | Not null | Salary to the teacher |

Table Name: online

| S.NO | Field Name | Data Type | Description |
|------|------------------|-----------|---|
| 1. | Student ID | Varchar | It specifies the ID of students. |
| 2. | Subject | Varchar | It specifies the subjects of examination. |
| 3. | Subject ID | Varchar | It specifies the subject ID. |
| 4. | Year | Numeric | It specifies the year of exam written. |
| 5. | Speech Detection | Numeric | It specifies the number of times speech detected. |
| 6. | Lip Movement | Numeric | It specifies the number of times lips moved. |
| 7. | Background Noise | Varchar | It detects the noises around the student. |

| | | | |
|-----|-------------------------|---------|---|
| 8. | Multi Windows Detection | Numeric | How many times does the student changed tabs. |
| 9. | Face Recognition | Varchar | To identify the facial movements. |
| 10. | Eye Detection | Varchar | To detect the eye ball rotations. |
| 11. | Malpractice | Numeric | It specifies the students unfair means. |
| 12. | College Name | Varchar | Name of the college students attended. |
| 13. | Exam Attempt Level | Numeric | Number of times student tried to attend the exam. |

D. Sample Screen Shots

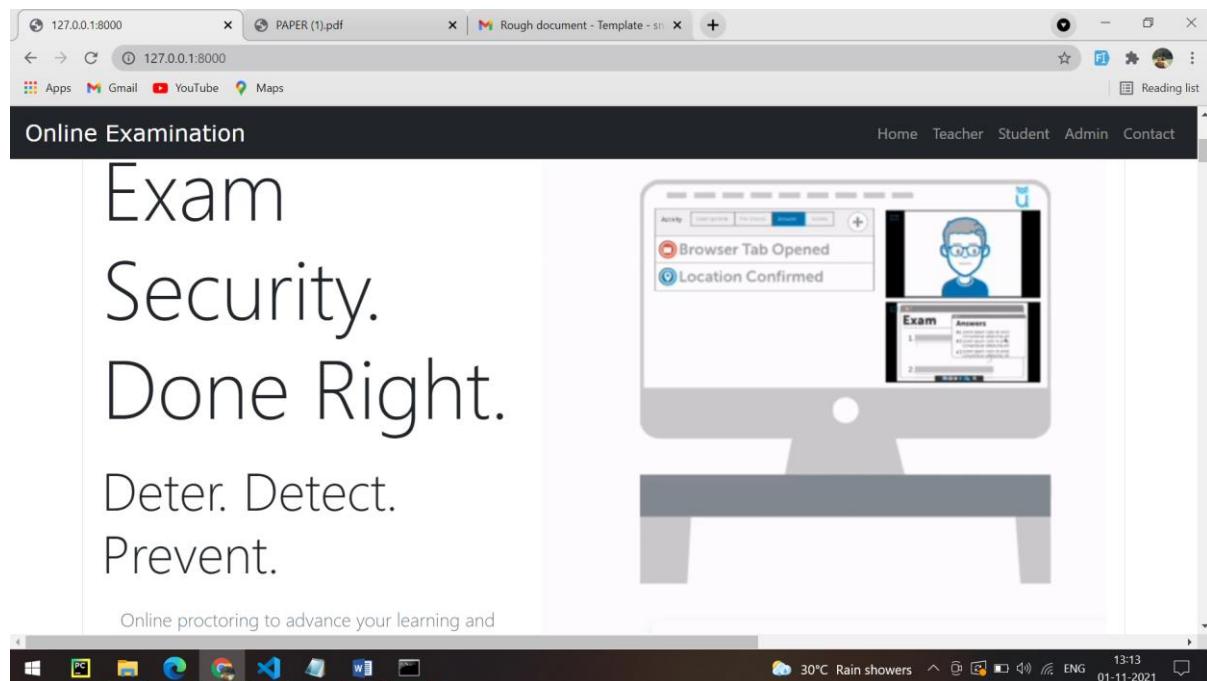


Fig D1. Home Page

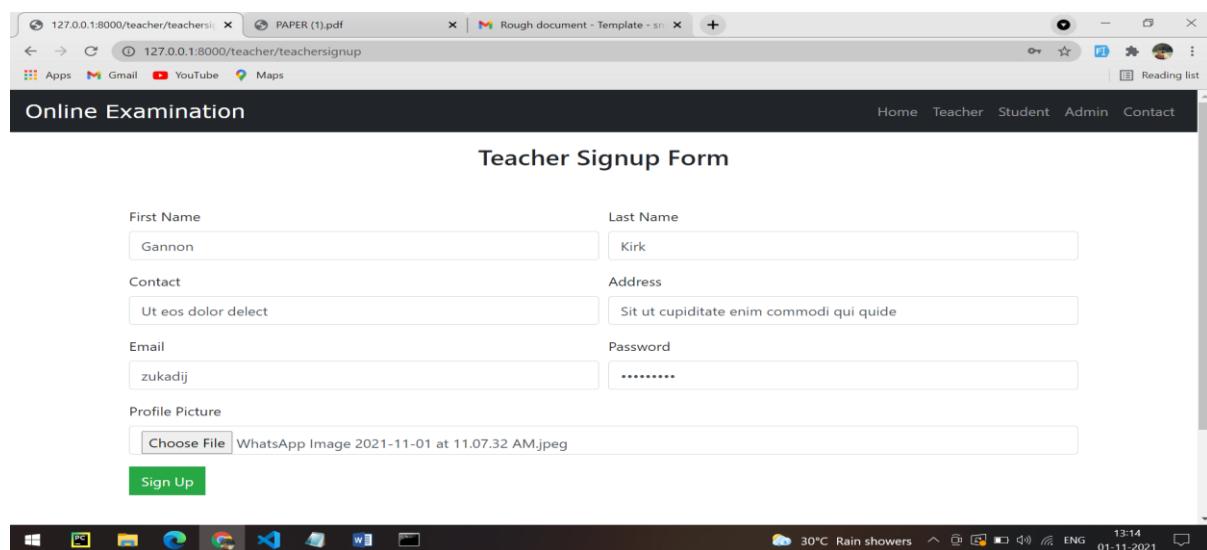


Fig D2. Teacher Signup Form

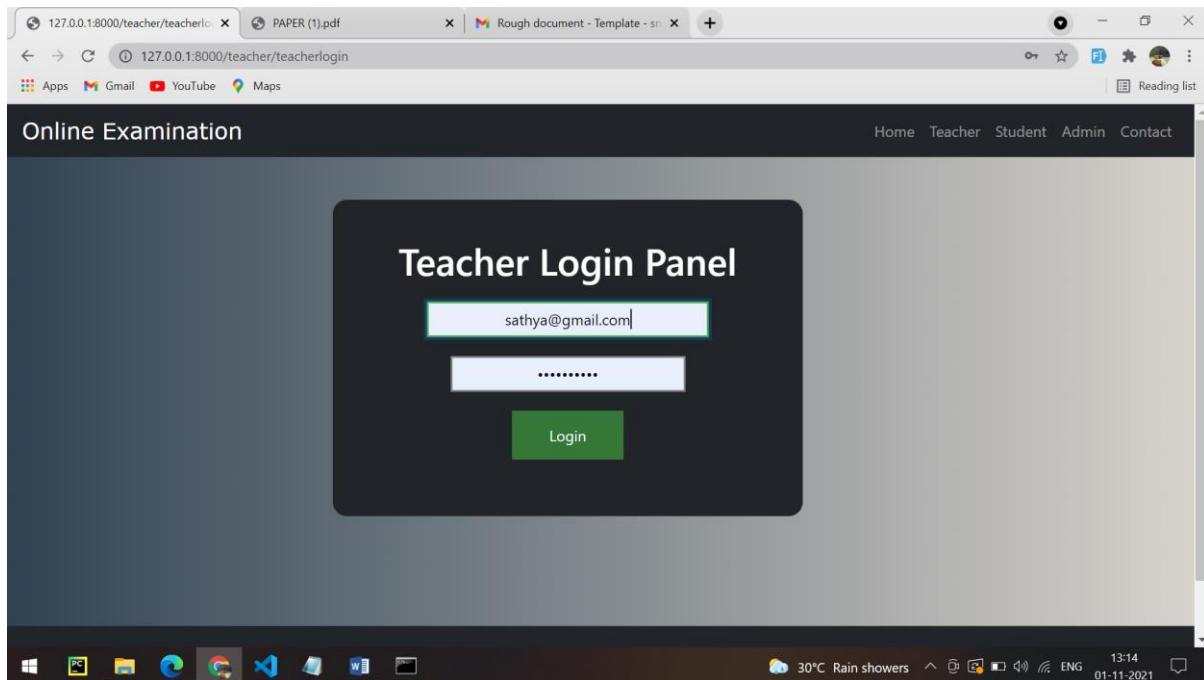


Fig D3. Teacher Login page

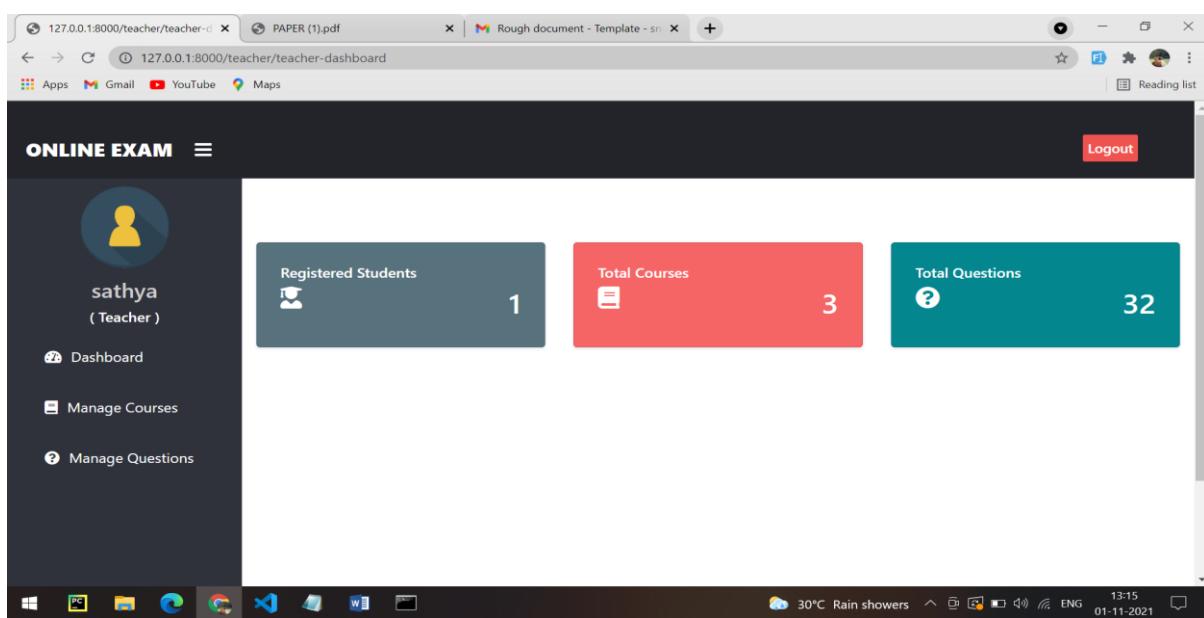


Fig D4. Teacher Dashboard page

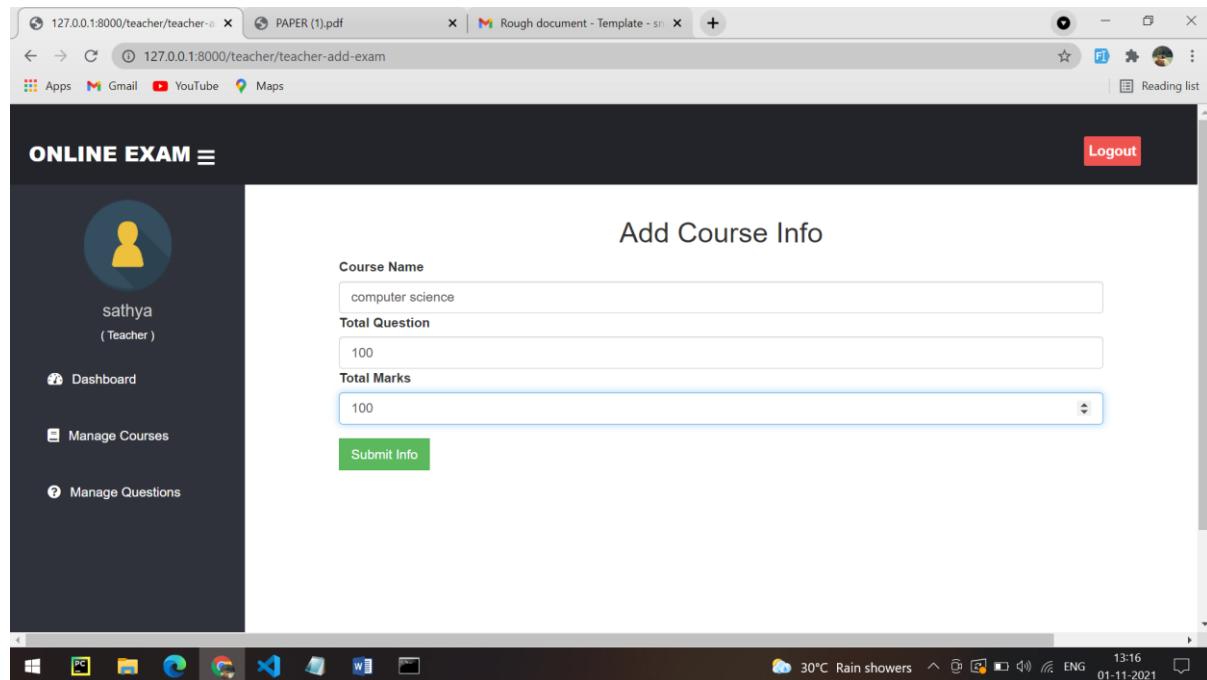


Fig D5. Add Course page

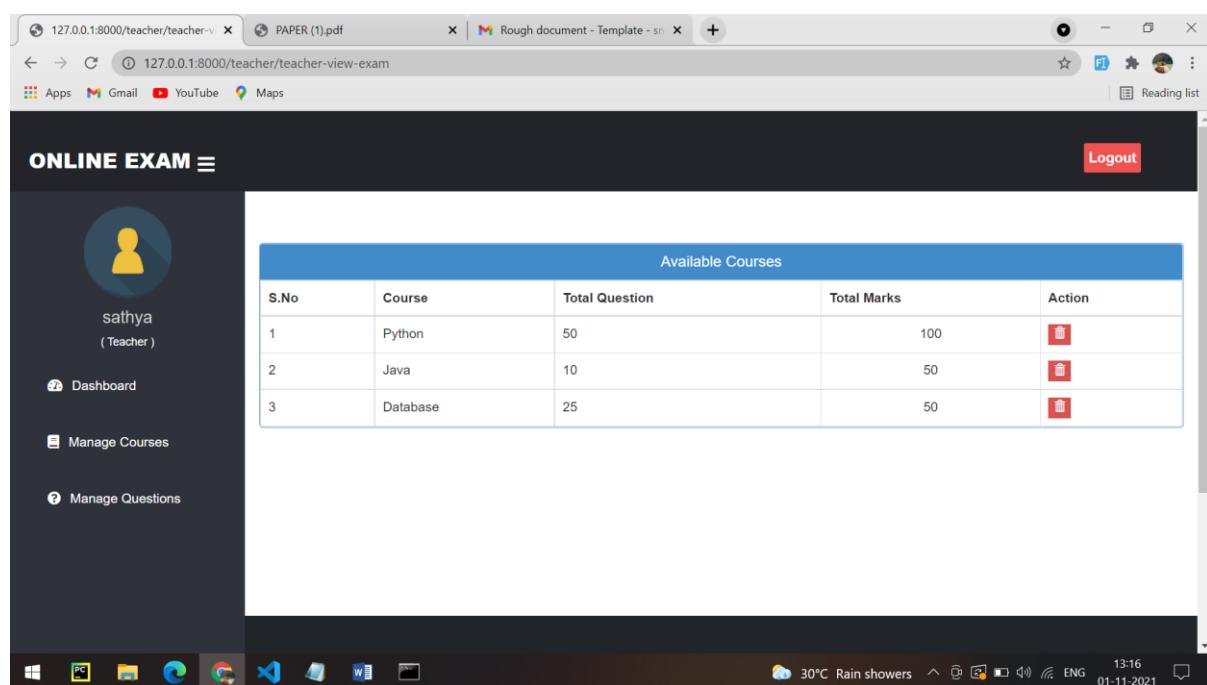
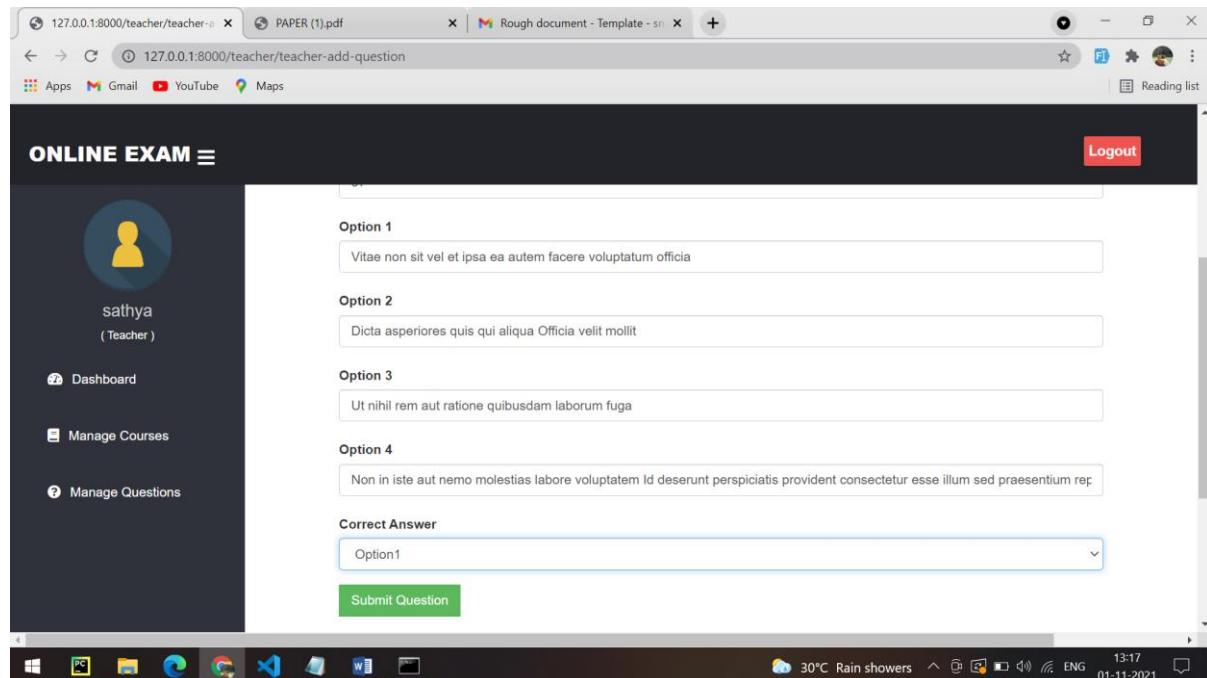
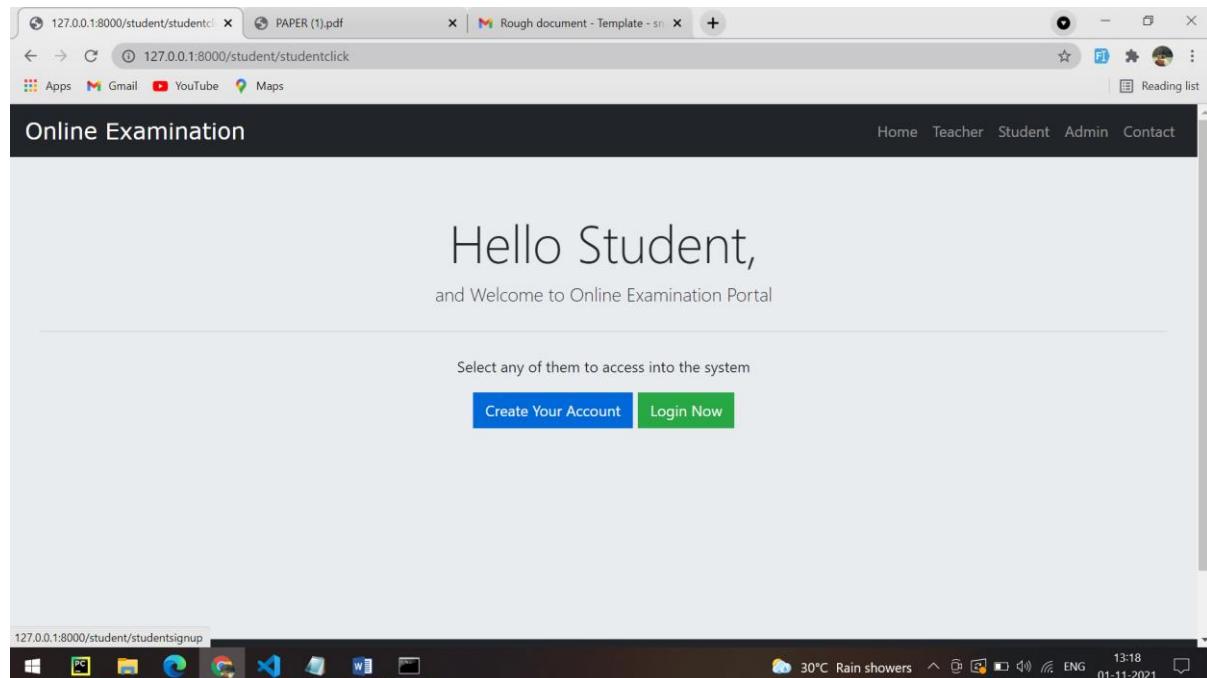


Fig D6. View course page

**Fig D7. Add question page**

| S.No | Question | Marks | Action |
|------|---|-------|--------|
| 1 | What is the maximum possible length of an identifier? | 2 | |
| 2 | Who developed the Python language? | 2 | |
| 3 | In which year was the Python language developed? | 2 | |
| 4 | In which language is Python written? | 2 | |
| 5 | Which one of the following is the correct extension of the Python file? | 2 | |
| 6 | In which year was the Python 3.0 version developed? | 2 | |
| 7 | What do we use to define a block of code in Python language? | 2 | |
| 8 | Which character is used in Python to make a single line comment? | 2 | |
| 9 | What is the method inside the class in python language? | 2 | |
| 10 | Which of the following is not a keyword in Python language? | 2 | |

Fig D8. View question page

**Fig D9. Student login page**

| | |
|---|---|
| First Name | Last Name |
| Charde | Oconnor |
| Contact | Address |
| Aperiam in molestiae | Ut repellendus Dolorem eiusmod error is |
| Email | Password |
| vuboxiso | ***** |
| Profile Picture | |
| <input type="button" value="Choose File"/> learning.png | |
| <input type="button" value="Sign Up"/> | |

Fig D10. Student signup form

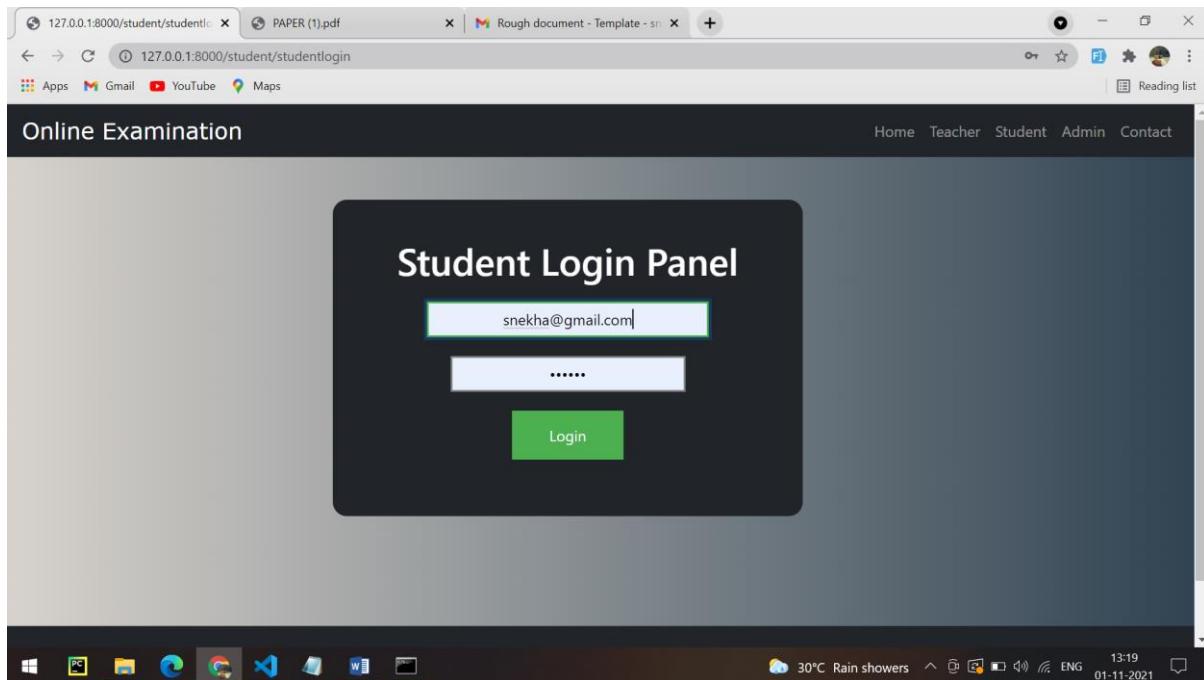


Fig D11. Student Login page

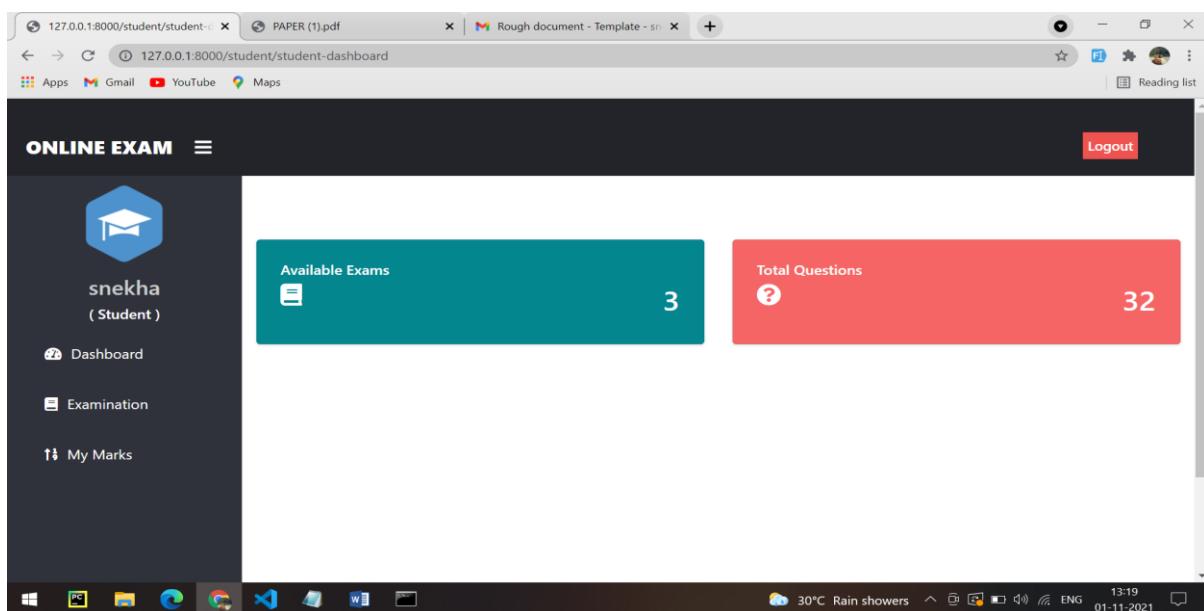


Fig D12. Student dashboard page

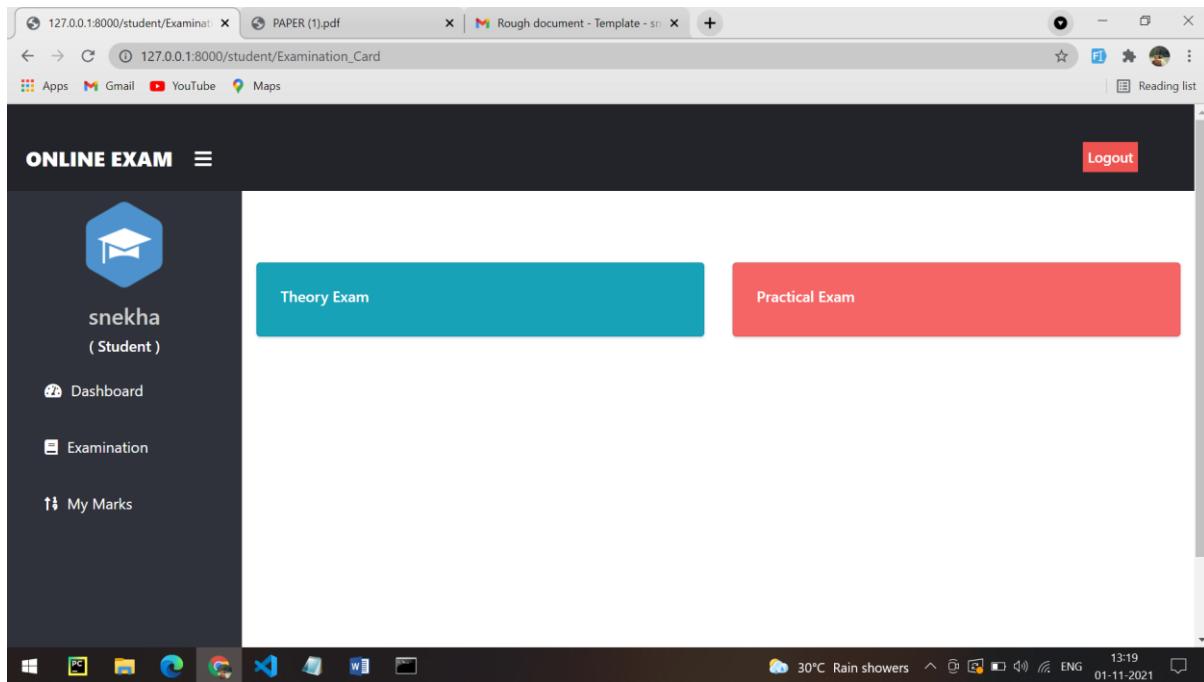


Fig D13. Examination page

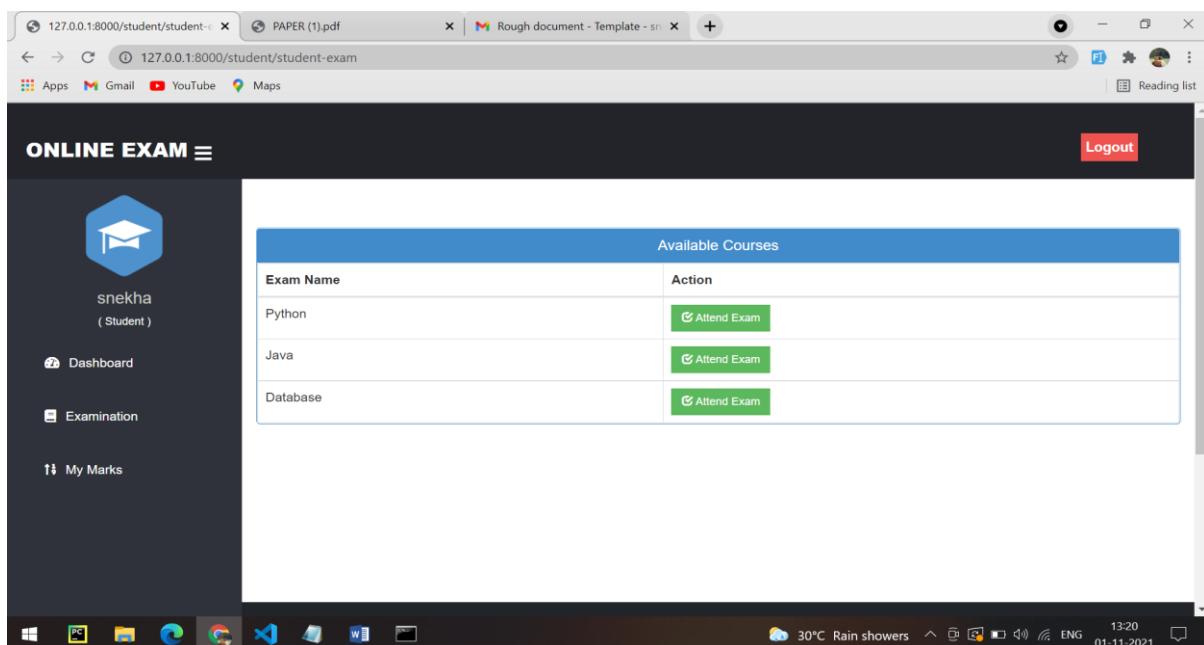


Fig D14. Attend Exam page

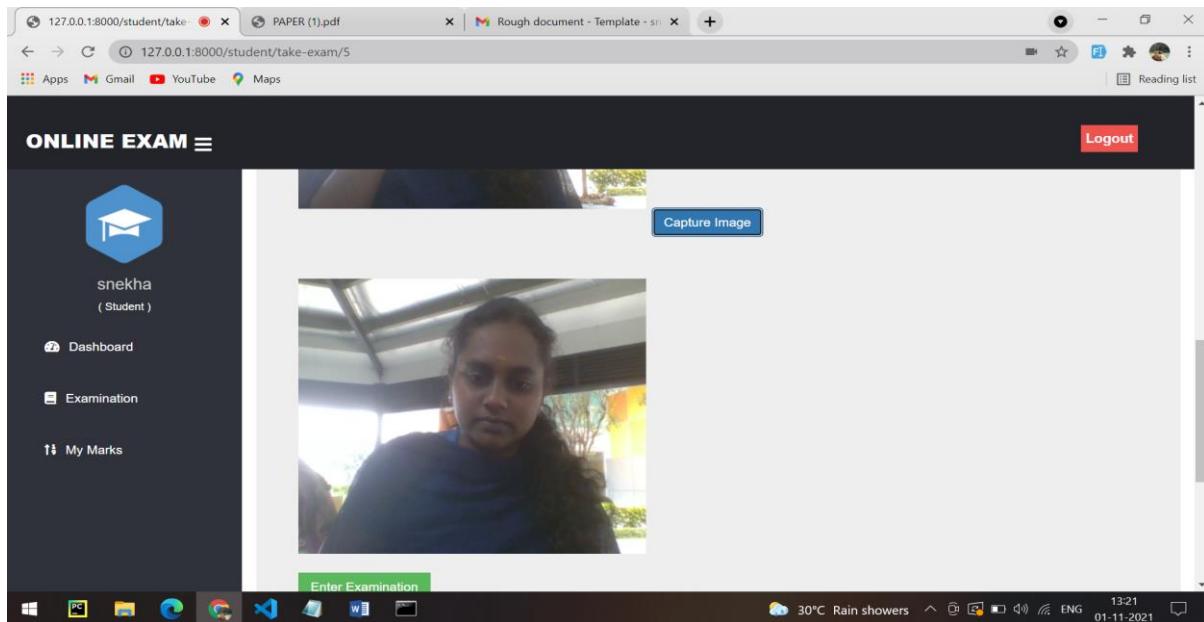


Fig D15. Take Exam page

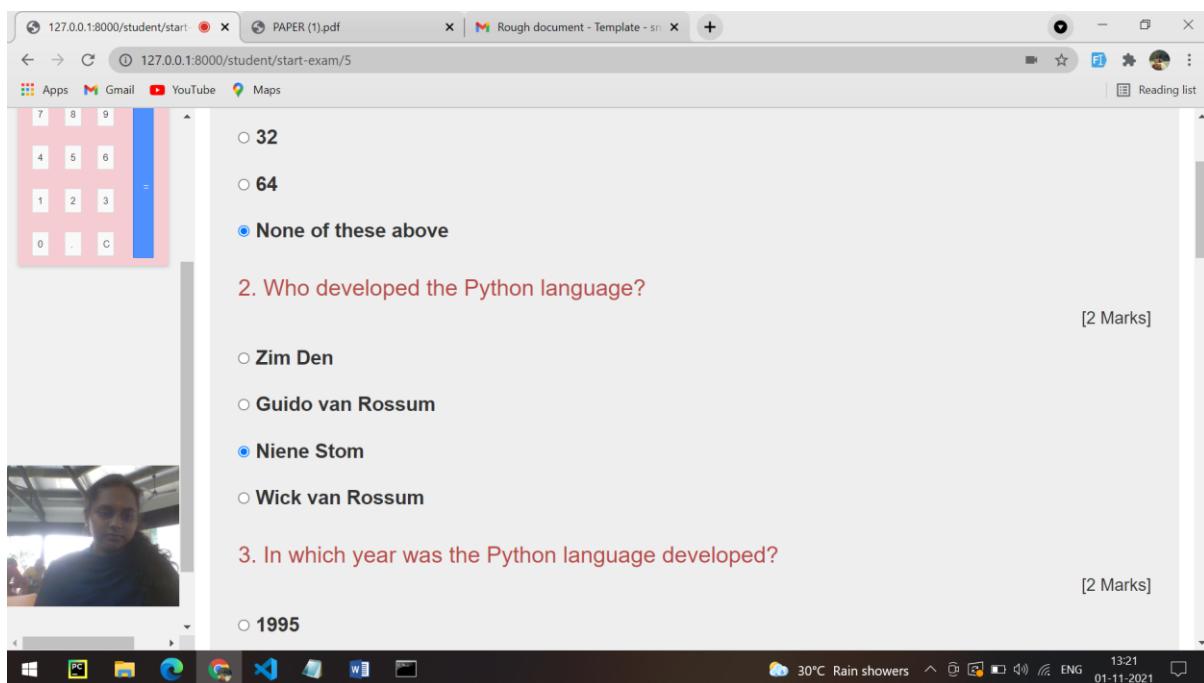
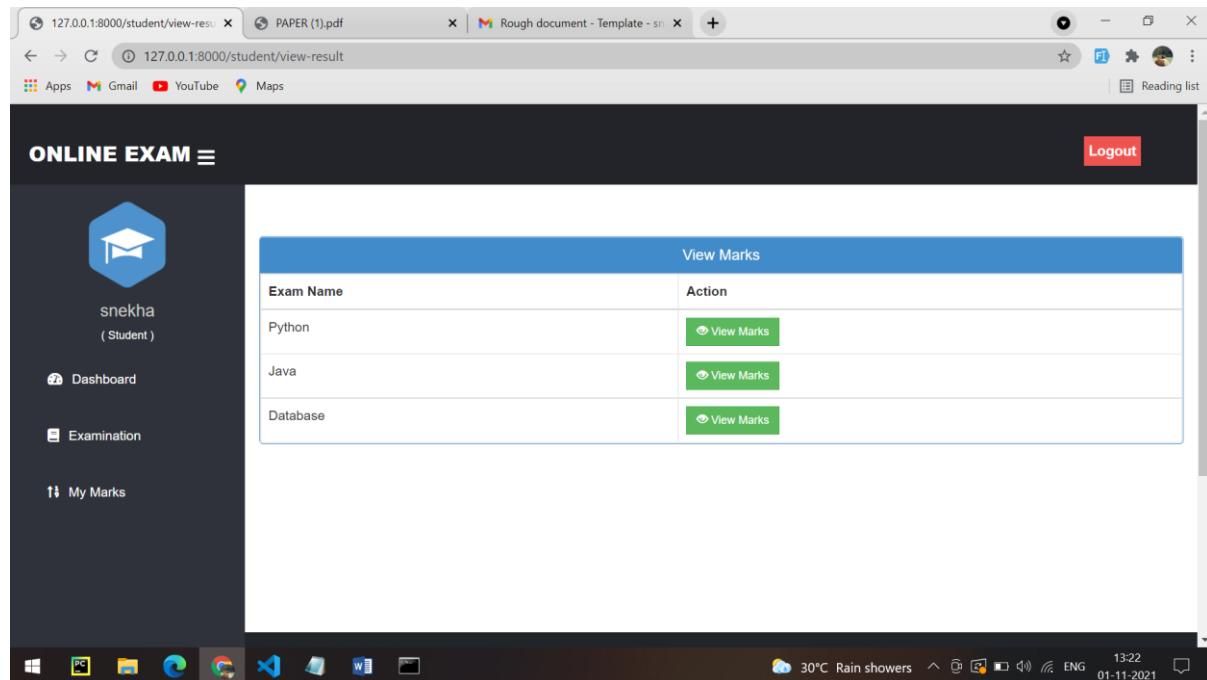
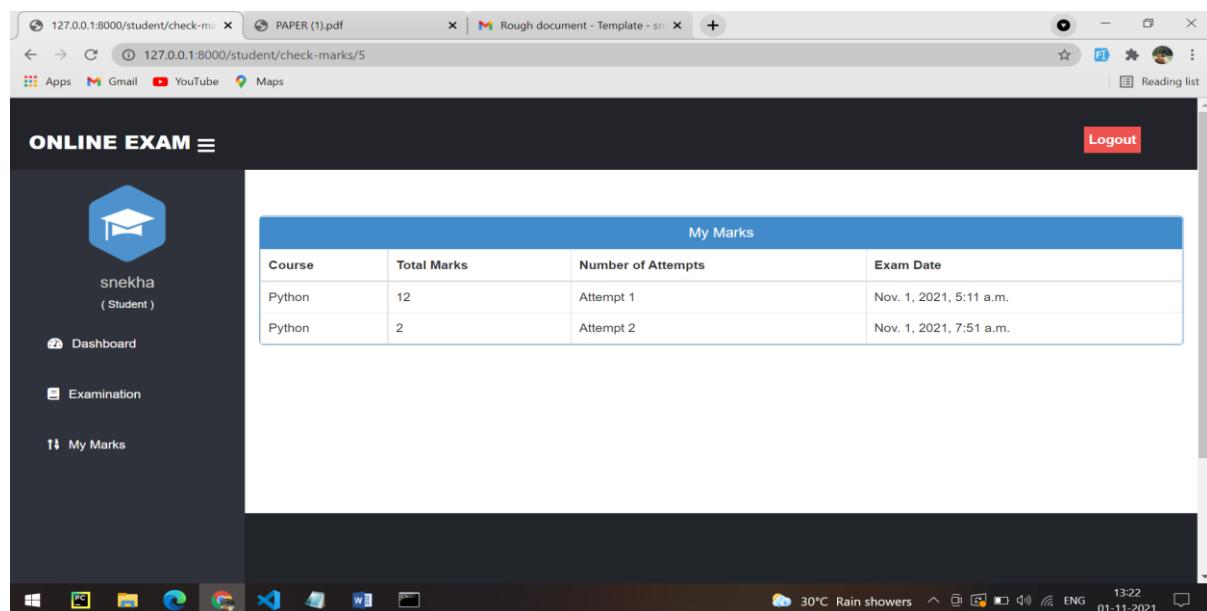


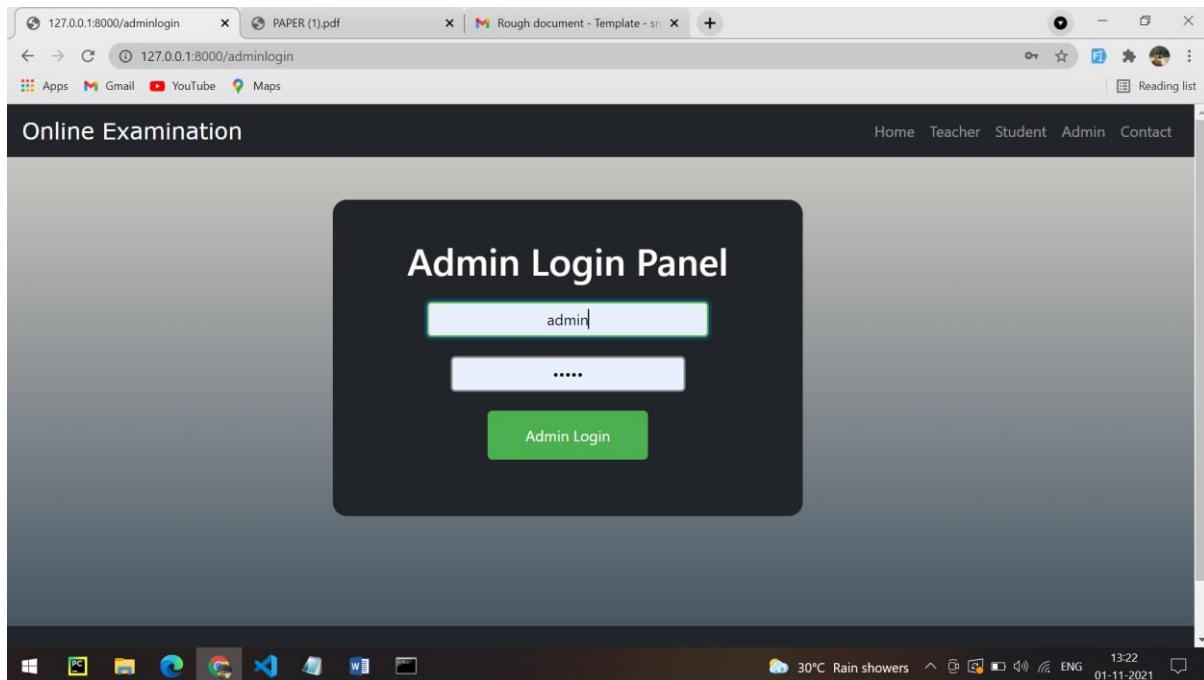
Fig D16. Exam page



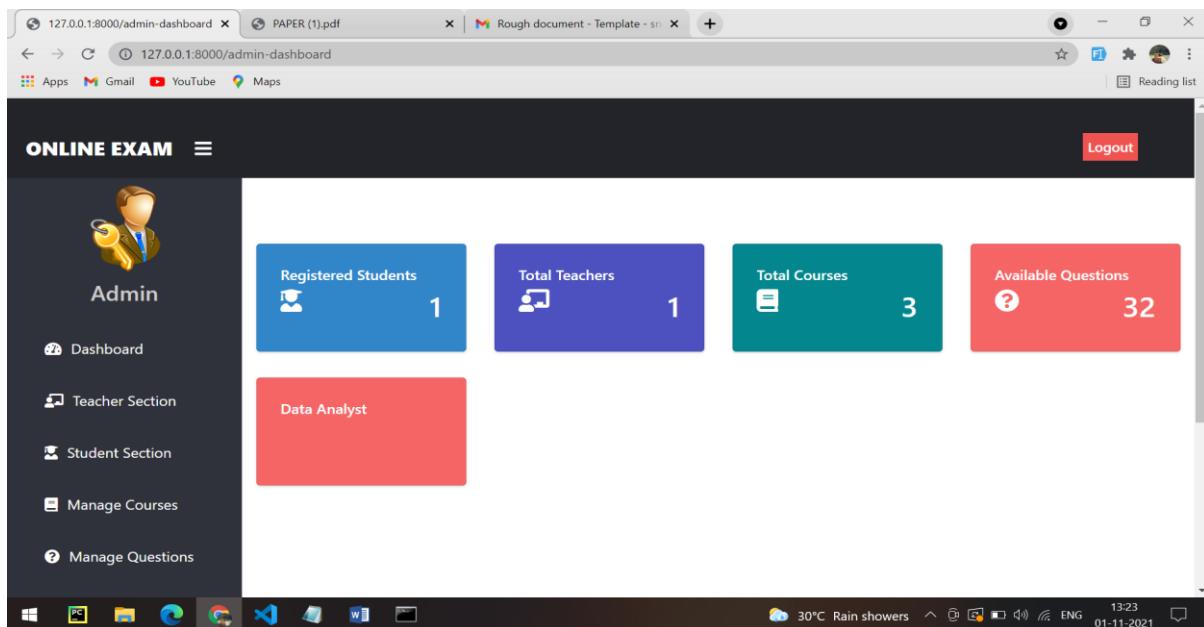
FigD17. View Result page



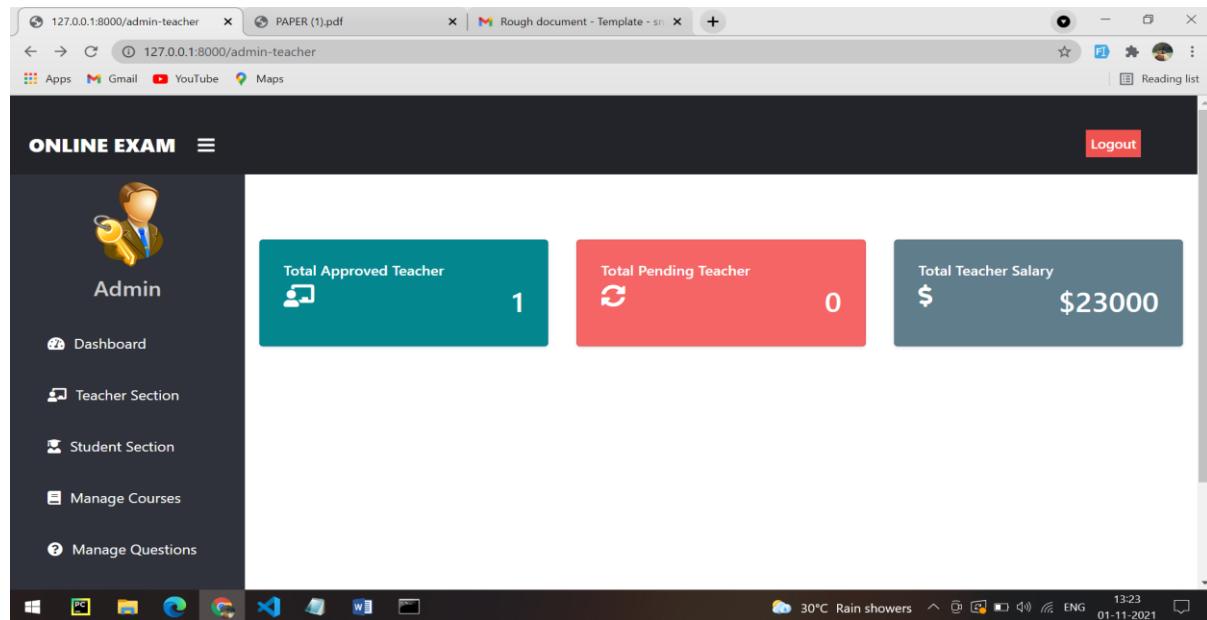
FigD18. Result page



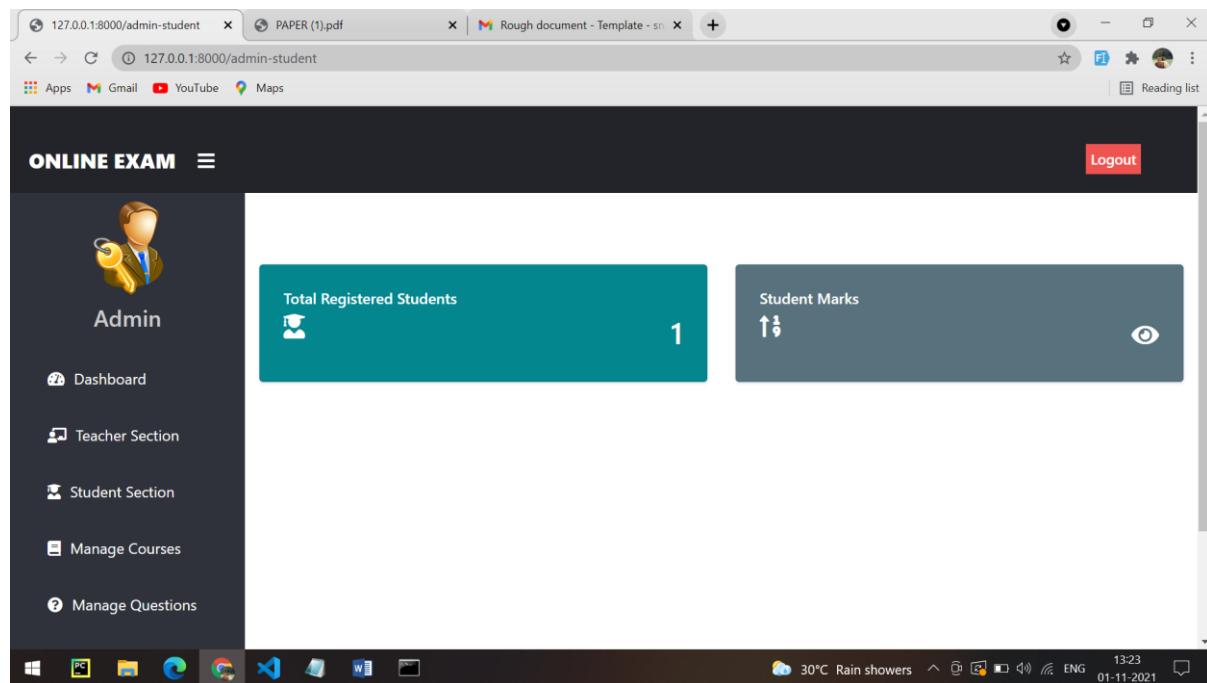
FigD18. Admin login page



FigD19. Admin dashboard



FigD20. Admin_teacher page



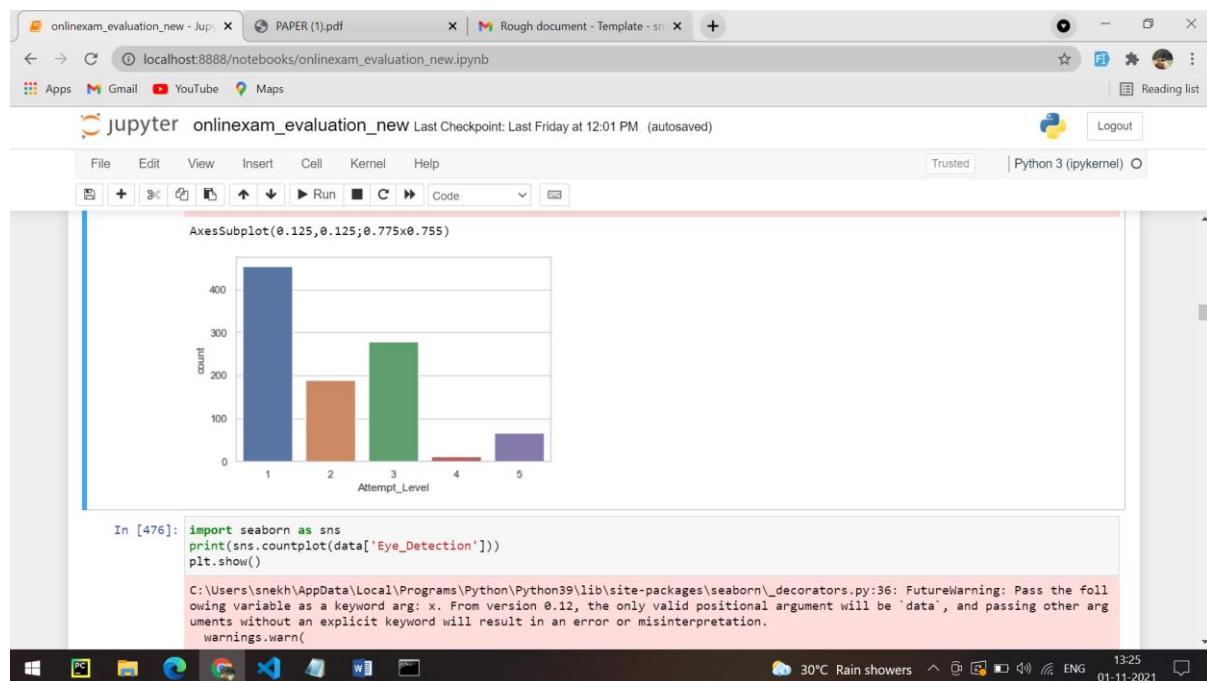
FigD21. Admin_Student page

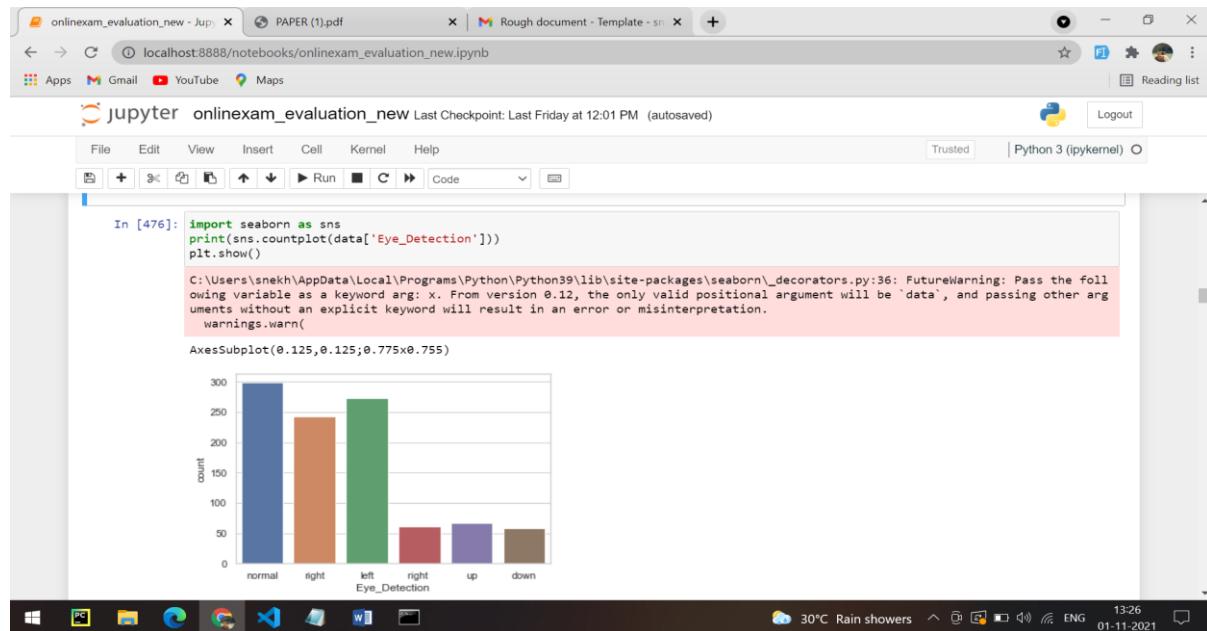
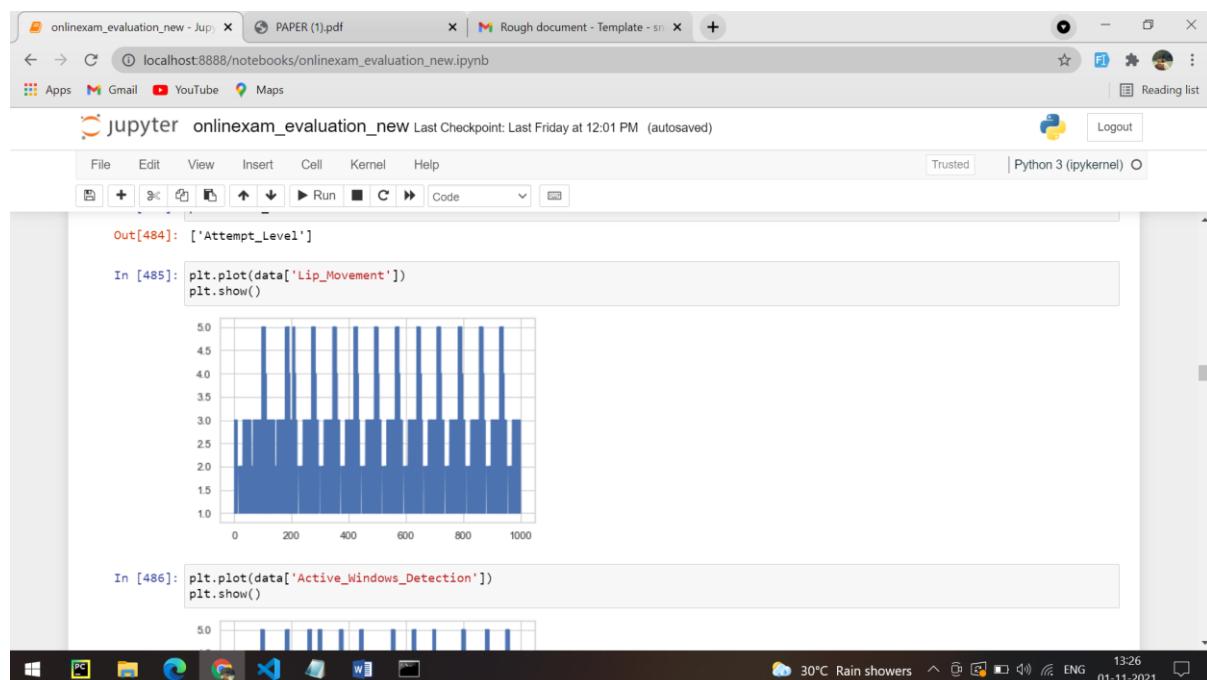
```
In [468]: #1.Collecting the data
import os
os.chdir(r"C:\Users\snekh\Desktop\Project")
data=pd.read_csv("online.csv")
data.head(5)

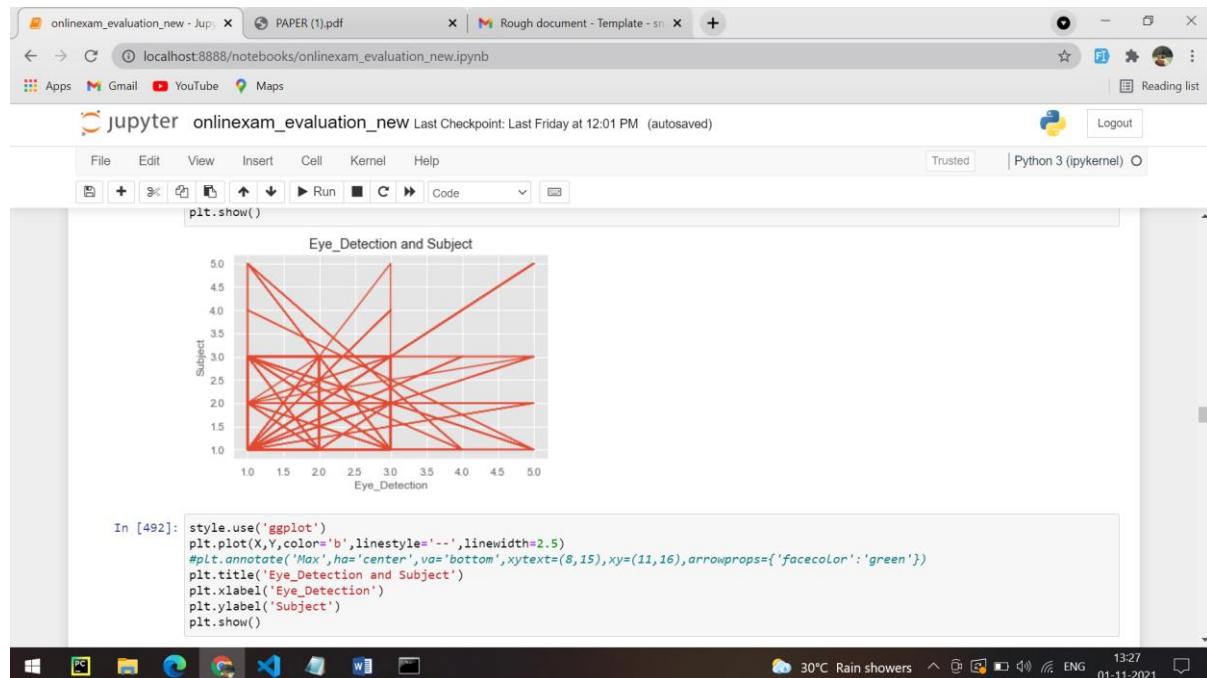
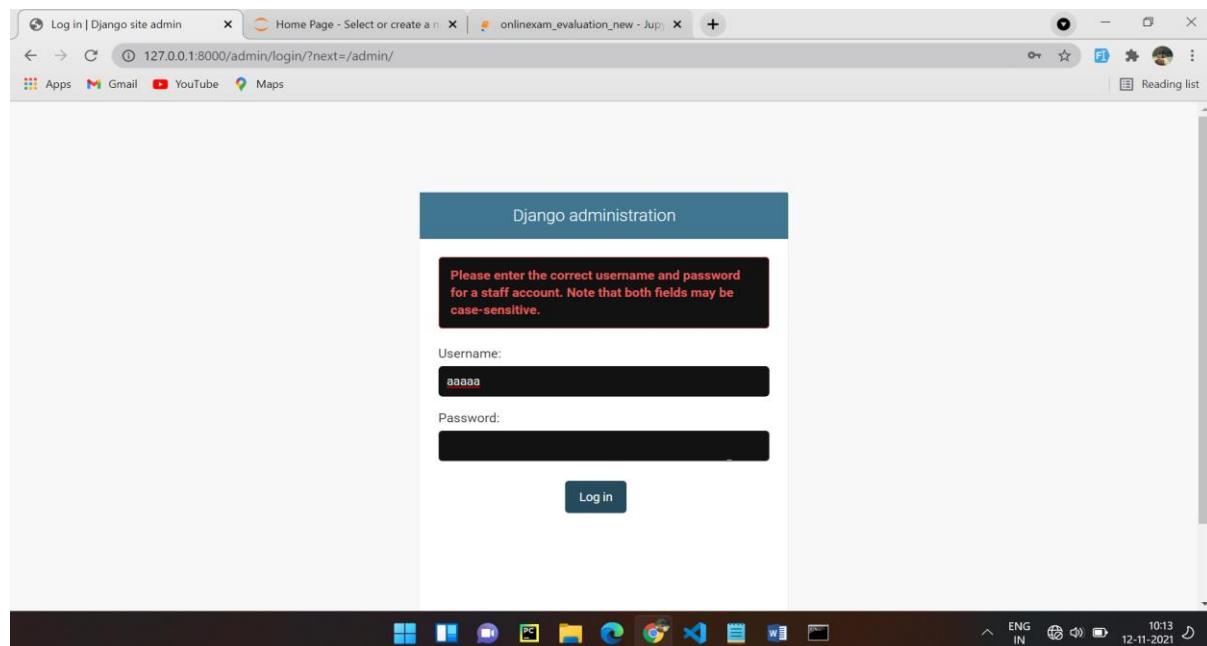
Out[468]:
   Student_ID  Subject_Id  Subject  Year  Text_Detection  Speech_Detection  Phone_Detection  Active_Windows_Detection  Lip_Movement  Face_Recognition
0  2019MBA01      CS0001  Marketing  2020            2                 1                  2                   2                1             normal
1  2019MBA02      CS0002       DBMS  2020            2                 3                  2                   1                1        movement
2  2019MBA03      CS0002       DBMS  2020            1                 1                  1                   3                3             normal
3  2019MBA04      CS0002       DBMS  2020            2                 3                  2                   1                1        movement
4  2019MBA05      CS0002       DBMS  2020            1                 1                  1                   3                3             normal

In [469]: #2.DataWrangling

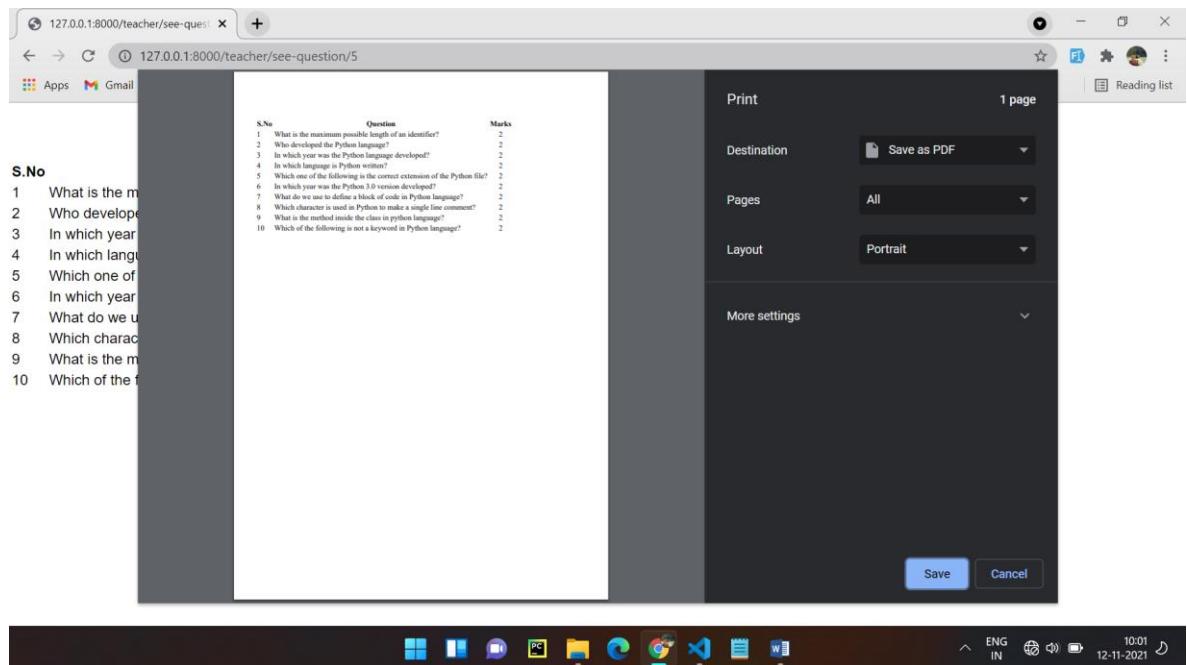
In [470]: # data.drop(['Unnamed: 19', 'Unnamed: 20', 'Unnamed: 21', 'Unnamed: 22', 'Unnamed: 23', 'Unnamed: 24'],axis=1,inplace=True)
```

Fig D22. Data Pre-processing**Fig D23. Visualizing the Attemp_level**

**Fig D24. Visualizing Eye_Detection****Fig D25. Visualizing lip_movement**

**Fig D26. Visualizing Eye_Detection based on subject****Fig D27. Test case for Admin Login**

E.Reports



FigE1. Question Paper Pdf

The screenshot shows a Jupyter Notebook interface with the title "jupyter onlinexam_evaluation_new (autosaved)". The notebook contains the following code in cell 545:

```

[[156  55  66   4  23]
 [ 61  19  29   2  16]
 [ 82  41  66   4  17]
 [ 8   1   0    0  0]
 [ 16  3   29   0  2]]
```

Below this, another cell shows:

```

In [545]: from sklearn.metrics import classification_report
print(classification_report(X_train,y_train))

      precision    recall  f1-score   support

          1       0.48      0.51      0.50      384
          2       0.16      0.15      0.15      127
          3       0.35      0.31      0.33      210
          4       0.00      0.00      0.00        9
          5       0.03      0.04      0.04      50

   accuracy                           0.35      788
  macro avg       0.20      0.20      0.20      788
weighted avg     0.35      0.35      0.35      788

```

FigE2. Report of Dataset

F. Sample Source Code

exam models

```
from django.db import models
from student.models import Student

class Course(models.Model):
    course_name = models.CharField(max_length=50)
    question_number = models.PositiveIntegerField()
    total_marks = models.PositiveIntegerField()

    def __str__(self):
        return self.course_name

class Question(models.Model):
    course=models.ForeignKey(Course,on_delete=models.CASCADE)
    marks=models.PositiveIntegerField()
    question=models.CharField(max_length=600)
    option1=models.CharField(max_length=200)
    option2=models.CharField(max_length=200)
    option3=models.CharField(max_length=200)
    option4=models.CharField(max_length=200)
    cat=((('Option1','Option1'),('Option2','Option2'),('Option3','Option3'),('Option4','Option4')))
    answer=models.CharField(max_length=200,choices=cat)

class Result(models.Model):
```

```
student = models.ForeignKey(Student,on_delete=models.CASCADE)
exam = models.ForeignKey(Course,on_delete=models.CASCADE)
marks = models.PositiveIntegerField()
date = models.DateTimeField(auto_now=True)
```

student models

```
from django.db import models
from django.contrib.auth.models import User

class Student(models.Model):
    user=models.OneToOneField(User,on_delete=models.CASCADE)
    profile_pic= models.ImageField(upload_to='profile_pic/Student/',null=True,blank=True)
    address = models.CharField(max_length=40)
    mobile = models.CharField(max_length=20,null=False)

    @property
    def get_name(self):
        return self.user.first_name+" "+self.user.last_name
    @property
    def get_instance(self):
        return self
    def __str__(self):
        return self.user.first_name
```

teacher models

```
from django.db import models

from django.contrib.auth.models import User

class Teacher(models.Model):
    user=models.OneToOneField(User,on_delete=models.CASCADE)
    profile_pic= models.ImageField(upload_to='profile_pic/Teacher/',null=True,blank=True)
    address = models.CharField(max_length=40)
    mobile = models.CharField(max_length=20,null=False)
    status= models.BooleanField(default=False)
    salary=models.PositiveIntegerField(null=True)

    @property
    def get_name(self):
        return self.user.first_name+" "+self.user.last_name

    @property
    def get_instance(self):
        return self

    def __str__(self):
        return self.user.first_name
```

admin url

```
from django.urls import path,include
from django.contrib import admin
```

```
from exam import views
from django.contrib.auth.views import LogoutView,LoginView
urlpatterns = [
    path('admin/', admin.site.urls),
    path('teacher/',include('teacher.urls')),
    path('student/',include('student.urls')),

    path("",views.home_view,name=""),
    path('logout', LogoutView.as_view(template_name='exam/logout.html'),name='logout'),
    path('contactus', views.contactus_view),
    path('afterlogin', views.afterlogin_view,name='afterlogin'),
    path('adminclick', views.adminclick_view),
    path('adminlogin',
        LoginView.as_view(template_name='exam/adminlogin.html'),name='adminlogin'),
    path('admin-dashboard', views.admin_dashboard_view,name='admin-dashboard'),
    path('admin-teacher', views.admin_teacher_view,name='admin-teacher'),
    path('admin-view-teacher', views.admin_view_teacher_view,name='admin-view-teacher'),
    path('update-teacher/<int:pk>', views.update_teacher_view,name='update-teacher'),
    path('delete-teacher/<int:pk>', views.delete_teacher_view,name='delete-teacher'),
```

```
path('admin-view-pending-teacher',
views.admin_view_pending_teacher_view,name='admin-view-pending-teacher'),  
  
path('admin-view-teacher-salary', views.admin_view_teacher_salary_view,name='admin-view-teacher-salary'),  
  
path('approve-teacher/<int:pk>', views.approve_teacher_view,name='approve-teacher'),  
path('reject-teacher/<int:pk>', views.reject_teacher_view,name='reject-teacher'),  
  
path('admin-student', views.admin_student_view,name='admin-student'),  
path('admin-view-student', views.admin_view_student_view,name='admin-view-student'),  
  
path('admin-view-student-marks', views.admin_view_student_marks_view,name='admin-view-student-marks'),  
  
path('admin-view-marks/<int:pk>', views.admin_view_marks_view,name='admin-view-marks'),  
  
path('admin-check-marks/<int:pk>', views.admin_check_marks_view,name='admin-check-marks'),  
  
path('update-student/<int:pk>', views.update_student_view,name='update-student'),  
path('delete-student/<int:pk>', views.delete_student_view,name='delete-student'),  
  
path('admin-course', views.admin_course_view,name='admin-course'),  
path('admin-add-course', views.admin_add_course_view,name='admin-add-course'),  
path('admin-view-course', views.admin_view_course_view,name='admin-view-course'),  
path('delete-course/<int:pk>', views.delete_course_view,name='delete-course'),  
  
path('admin-question', views.admin_question_view,name='admin-question'),  
path('admin-add-question', views.admin_add_question_view,name='admin-add-question'),
```

```
    path('admin-view-question',    views.admin_view_question_view,name='admin-view-question'),  
    path('view-question/<int:pk>', views.view_question_view,name='view-question'),  
    path('delete-question/<int:pk>', views.delete_question_view,name='delete-question'),  
]  
]
```

student urls

```
from django.urls import path  
  
from student import views  
  
from django.contrib.auth.views import LoginView
```

```
urlpatterns = [  
  
path('studentclick', views.studentclick_view),  
  
path('studentlogin',  
LoginView.as_view(template_name='student/studentlogin.html'),name='studentlogin'),  
  
path('studentsignup', views.student_signup_view,name='studentsignup'),  
  
path('student-dashboard', views.student_dashboard_view,name='student-dashboard'),  
  
path('student-exam', views.student_exam_view,name='student-exam'),  
  
path('take-exam/<int:pk>', views.take_exam_view,name='take-exam'),  
  
path('start-exam/<int:pk>', views.start_exam_view,name='start-exam'),  
  
path('calculate-marks', views.calculate_marks_view,name='calculate-marks'),  
  
path('view-result', views.view_result_view,name='view-result'),  
  
path('check-marks/<int:pk>', views.check_marks_view,name='check-marks'),  
  
path('student-marks', views.student_marks_view,name='student-marks'),
```

```
path('cal',views.cal,name="cal"),
path('Examination_Card',views.Examination_Card,name='Examination_Card'),
path('online_compiler',views.online_compiler,name='online_compiler'),
path('Descriptive_Question',views.Descriptive_Question,name='Descriptive_Question'),
]
```

teacher urls

```
from django.urls import path
from teacher import views
from django.contrib.auth.views import LoginView
```

```
urlpatterns = [
    path('teacherclick', views.teacherclick_view),
    path('teacherlogin',
         LoginView.as_view(template_name='teacher/teacherlogin.html'),name='teacherlogin'),
    path('teachersignup', views.teacher_signup_view,name='teachersignup'),
    path('teacher-dashboard', views.teacher_dashboard_view,name='teacher-dashboard'),
    path('teacher-exam', views.teacher_exam_view,name='teacher-exam'),
    path('teacher-add-exam', views.teacher_add_exam_view,name='teacher-add-exam'),
    path('teacher-view-exam', views.teacher_view_exam_view,name='teacher-view-exam'),
    path('delete-exam/<int:pk>', views.delete_exam_view,name='delete-exam'),
    path('teacher-question', views.teacher_question_view,name='teacher-question'),
    path('teacher-add-question', views.teacher_add_question_view,name='teacher-add-question'),
```

```
path('teacher-view-question',           views.teacher_view_question_view,name='teacher-view-
question'),  
path('see-question/<int:pk>', views.see_question_view,name='see-question'),  
path('remove-question/<int:pk>', views.remove_question_view,name='remove-question'),  
]
```

Algorithms:

```
import numpy as np  
import pandas as pd  
import matplotlib.pyplot as plt  
from sklearn.linear_model import LogisticRegression  
from sklearn.model_selection import train_test_split  
from sklearn import metrics  
import pandas as pd  
import numpy as np  
from sklearn import preprocessing  
import matplotlib.pyplot as plt  
plt.rc("font", size=14)  
from sklearn.linear_model import LogisticRegression  
from sklearn.model_selection import train_test_split  
import seaborn as sns  
sns.set(style="white")  
sns.set(style="whitegrid", color_codes=True)  
import os  
os.chdir(r"C:\Users\snekh\Desktop\Project")
```

```
data=pd.read_csv("online.csv")
data.head(5)
train,test=train_test_split(data,test_size=0.3)
print(train.shape)
print(test.shape)
Y=data.iloc[:,3].values

X=data.iloc[:,4].values
import matplotlib.pyplot as plt
from matplotlib import style
%matplotlib inline
style.use('ggplot')
plt.plot(X,Y)
plt.title('Eye_Detection and Subject')
plt.xlabel('Eye_Detection')
plt.ylabel('Subject')
plt.show()

X = data[['Text_Detection',
'Speech_Detection','Phone_Detection','Active_Windows_Detection','Lip_Movement']]
y = data['malpractice']

X_train,X_test,y_train,y_test = train_test_split(X,y,test_size=0.25,random_state=0)

logistic_regression= LogisticRegression()
```

```
logistic_regression.fit(X_train,y_train)

y_pred=logistic_regression.predict(X_test)

confusion_matrix = pd.crosstab(y_test, y_pred, rownames=['Actual'], colnames=['Predicted'])

sns.heatmap(confusion_matrix, annot=True)

print('Accuracy: ',metrics.accuracy_score(y_test, y_pred))

plt.show()

lip_X=train[prediction_var]

lip_Y=train['Lip_Movement']

lip_X=train[prediction_var]

eye_Y1=train['Eye_Detection']

lip_X=train[prediction_var]

lip_Z=train['Subject']

lip_X=test[prediction_var]

lip_Y=test['Lip_Movement']

eye_X=test[prediction_var]

eye_Y1=test['Eye_Detection']

lip_X=test[prediction_var]

eye_Y1=test['Subject']

logistic_model=LogisticRegression()

logistic_model.fit(lip_X,lip_Y)

logistic_model_2=LogisticRegression()
```

```
logistic_model_2.fit(lip_X,lip_Y)  
#Testing the algorithm for Lip Movement  
predicted_value=logistic_model.predict(lip_X)  
logistic_model_1=LogisticRegression()  
logistic_model_1.fit(lip_X,lip_Y)  
#Training the model for Eye Detection  
  
logistic_model_2=LogisticRegression()  
logistic_model_2.fit(lip_X,lip_Y)
```