

A
PROJECT REPORT
ON
SMART EXAMINATION SYSTEM
Towards partial fulfilment of the requirement in
5th Semester BCA (2022-2023)

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Submitted To:-



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Under the guidance of

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CERTIFICATE

This is to certify that AMAN KUMAR SINGH, ROSHANI SINGH, KARTHIK SOANKUSRE the student(s) of Parul Institute of Computer Application, has/have satisfactorily completed the project entitled “SMART EXAMINATION SYSTEM” as a part of course curriculum in BCA, Semester-V for the academic year 2022-2023 under guidance of Prof. ALKA CHOKSI.

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Quality of work	Grade	Sign of Internal guide
Poor / Average / Good / Excellent	B / B+ / A / A+	

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1. Research

1.1. What is research?

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. It is a systematic inquiry to describe, explain, predict and control the observed phenomenon. It involves inductive and deductive methods.

1.2. Types of Research Methodology

Research methods are broadly classified as Qualitative and Quantitative. Both methods have distinctive properties and data collection methods.

1.2.1 Qualitative Methods

It is a method that collects data using conversational methods, usually open-ended questions. It helps a researcher to understand what participants think and why they think it in a particular way. Types of qualitative methods include:

- a. One-to-one interview
- b. Focus Groups
- c. Ethnographic studies
- d. Text Analysis
- e. Case Study

1.2.2 Quantitative Methods

This method deals with numbers and measurable forms. It uses a systematic way of investigating events or data. It answers questions to justify relationships with measurable variables to either explain, predict or control a phenomenon. Types of quantitative methods include:

- a. Survey research
- b. Descriptive research
- c. Correlational research

2. Feasibility Studies

What is Feasibility?

As the name implies, a feasibility analysis is used to determine the viability of an idea, such as ensuring a project is legally and technically feasible as well as economically justifiable. It tells us whether a project is worth the investment—in some cases, a project may not be doable. There can be many reasons for this, including requiring too many resources, which not only prevents those resources from performing other tasks but also may cost more than an organization would earn back by taking on a project that isn't profitable.

A well-designed study should offer a historical background of the business or project, such as a description of the product or service, accounting statements, details of operations and management, marketing research and policies, financial data, legal requirements, and tax obligations. Generally, such studies precede technical development and project implementation.

2.1. Technical Feasibility

This assessment focuses on the technical resources available to the organization. It helps organizations determine whether the technical resources meet capacity and whether the technical team is capable of converting the ideas into working systems. Technical feasibility also involves the evaluation of the hardware, software, and other technical requirements of the proposed system. As an exaggerated example, an organization wouldn't want to try to put Star Trek's transporters in their building—currently, this project is not technically feasible.

2.2. Economic Feasibility

This assessment typically involves a cost/ benefits analysis of the project, helping organizations determine the viability, cost, and benefits associated with a project before financial resources are allocated. It also serves as an independent project assessment and enhances project credibility—helping decision-makers determine the positive economic benefits to the organization that the proposed project will provide.

2.3. Operational Feasibility

Determine the viability, cost, and benefits associated with a project before financial resources are allocated. It also serves as an independent project assessment and enhances project credibility—helping decision-makers determine the positive economic benefits to the organization that the proposed project will provide.

2.4. Importance of Feasibility Studies

A feasibility study is conducted to determine the success and minimize the risks related to the project. It is not merely project research, but a framework or a plan on how to establish and run a business successfully in the long run. It contains five essential components, including market research, financial research, management research, schedule determination, and technical research.

2.5. Feasibility Study of our Proposed System

2.5.1. Technical Feasibility:

- In this proposed system, technical feasibility depends on open-source tools and technologies.
- In this system technologies like DJANGO, HTML, PYTHON, CSS, JavaScript, MySQL, Bootstrap, and Canvas are used.

2.5.2. Economic Feasibility:

- Development Costs:
The system is economically feasible as its costs nothing because all depend on open source.
- Production Costs:
Hosting cost, operation, and maintenance cost including software and hardware upgrading.

2.5.3. Operational Feasibility:

- The main purpose of the proposed system is that it will solve the task of teachers by reducing their work.
- Exam will be submitted automatically after some given time.
- This system can also able to conduct coding exam.
- The system will work on managing to-do for teachers and students.

3. System Requirement Specification

3.1. Introduction To SRS

3.1.1. What is SRS?

A software requirements specification (SRS) is a description of a software system to be developed. It lays out functional and non-functional requirements and may include a set of use cases that describe user interactions that the software must provide.

3.1.2. Need of SRS

To fully understand one's project, they must come up with an SRS listing out their requirements, how are they going to meet it and how will they complete the project. It helps the team to save upon their save upon their time as they are able to comprehend how are going to go about the project. Doing this also enables the team to find out about the limitations and risks early on.

3.2. Abstract

This Online Examination System is created for the betterment and ease for Student and Faculty to conduct Examination. There is only three types of user in this System, Superuser (also known as admin) are responsible for every activity which will be performed in this system, they can manage all the users and systems.

Faculties are work as responsible for managing exam of this System and Students can appear those exam and result will be generated based on it. In this system, there is automatic submission of paper and also automatic marks will be calculated of Multiple Choice Questions. This System also capable to conduct coding exams, and same marks will be automatically calculated by this system based on the code. For Subjective type questions, three faculty is required to check same paper then average marks will be given by the System. While appearing the exam, students can also can't change the tab, if they do so, form will be auto submitted and faculties will also be informed regarding this. This system is based on the django framework of python which is makes this system more secured than other websites.

3.3. System Users

3.3.1. Admin

3.3.2. Professor

3.3.3. Students

3.4.Modules

3.4.1. Login

3.4.2. Sign-up

3.4.3. Exam

3.4.4. Result

3.5.Modules Description

3.5.1. Login

This System having a login username and password for users and every login detail can tracked by user, so its login is very secure.

3.5.2. Sign-up

To login in this System, there is sign-up features, after that any user can access this system, and only students can register to this system. For registration of faculty, admin can only do so.

3.5.3. Exam

Exam having many sub-categories, Exam can be created by Faculty and Students having access of it, System will allow only valid users for the exam. Exam papers can also be edited in the future, based on requirements.

3.5.4. Result

Students can see the detailed report of there exam submission and also short description of there result. If students having any query regarding there paper check they can contact to the respective faculies.

3.6. Hardware Requirements

Name of Components	Specification
Processor	Intel Core i3 or More / AMD Ryzen 3 or More
RAM	4GB or More
Hard Disk	120GB or More

Table 3.6 – Hardware Requirement Table

3.7. Software Requirements

Name of Components	Specification
Operating System	Windows 10 or More, Or any latest Linux Distribution, Or Mac Distribution
Software development Kit	Visual Studio Code, Python Interpreter
Tools & languages	HTML, PYTHON, CSS, JavaScript, Bootstrap4, MySQL, Canvas.

Table 3.7 – Software Requirement Table

3.7. Time Line Chart

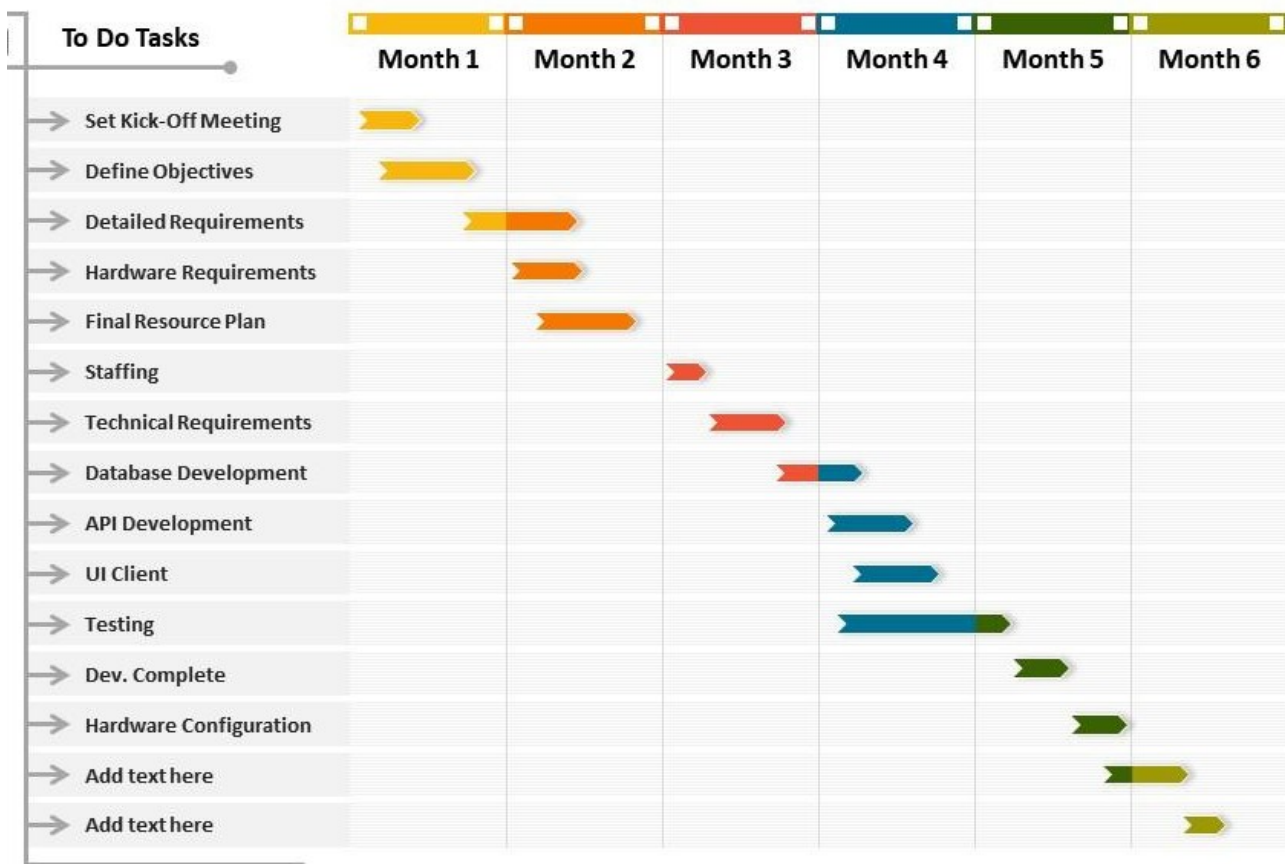


Figure 3.7.1. - Time Line Chart

4. Technology Description

In the development of this proposed system Django Framework of Python is used. Python is a server scripting language, and a powerful tool for making dynamic and interactive Web pages. PHP is a widely-used, free, and efficient alternative to competitors such as Microsoft's ASP. And other technology used are HTML, CSS, JavaScript and MySQL.

4.1. Features and Limitations of New System

Existing System	New System
In the previous systems, there is no any feature like system will send mail to the professors if students windows goes out for 5 times while appearing for exam.	This system having this feature, in which faculties automatically get mail about student name and enrolment number, and time of windows out while appearing for exam.
In previous systems, securities are not that much good.	This system is developed on the Django Framework of Python, which raises it's securities and decrease the chances of attack.
In previous systems, there is no any feature to conduct coding exam.	This system is able to conduct coding exam, currently this system only support Python language for coding exam but in future we will upgrade it to support multiple exams.
Previous systems having a problem of crashing when number of user is more.	In this system, we focus on this part, which decrease the chance of system crash.

Table 4.1 – comparison between this to other systems

5. Data Flow Diagram

5.1. Context Level DFD's

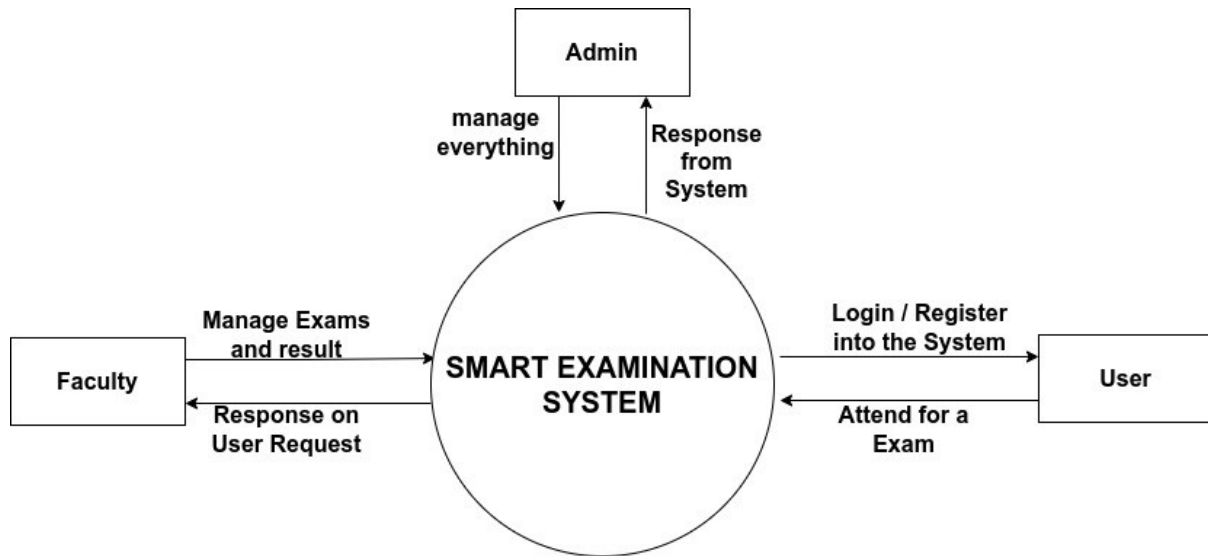


Figure 5.1 – DFD Context Level

5.2.Level 1 DFD's:

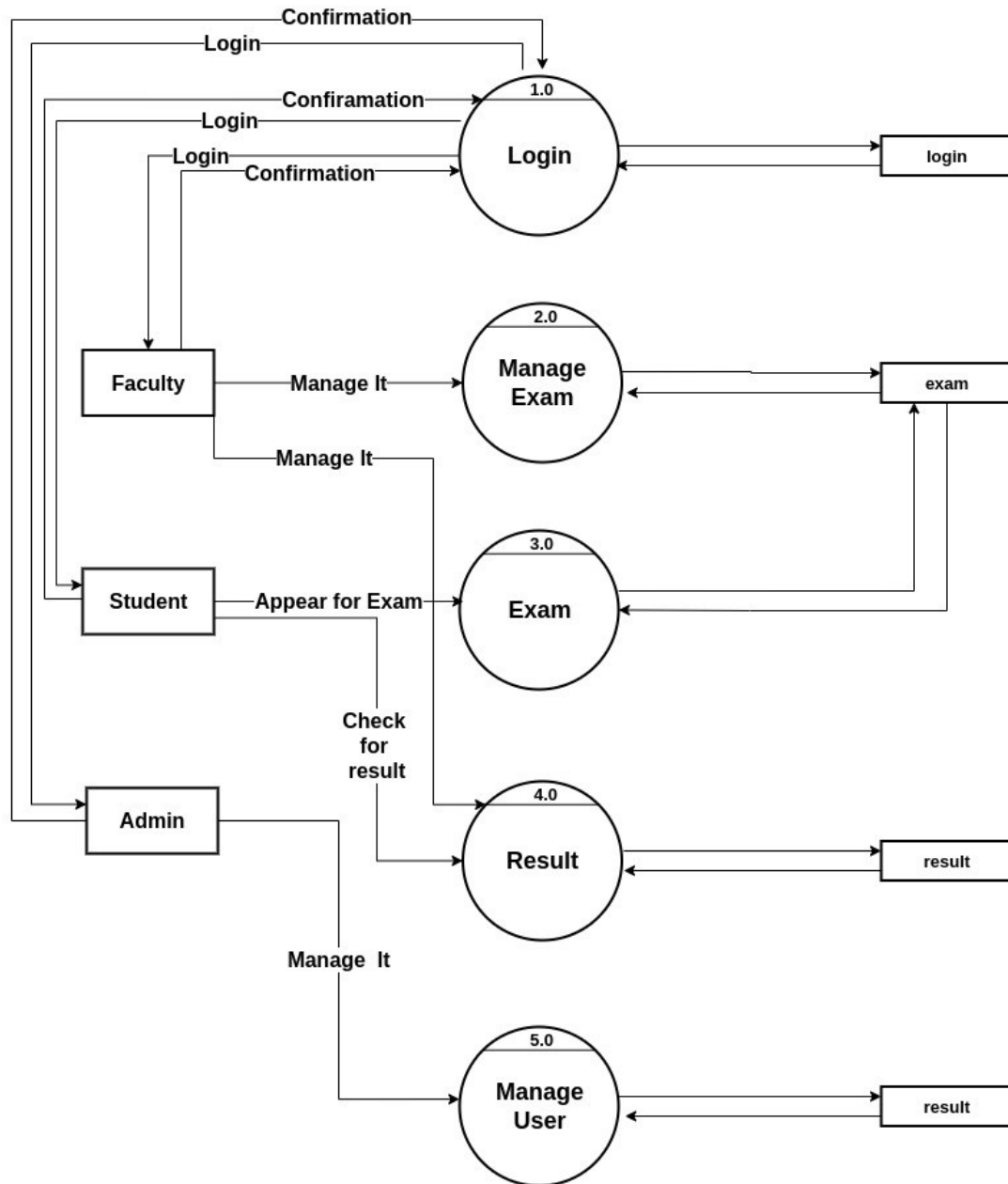


Figure 5.2 – DFD Level 1 diagram

5.3.Level 2 DFD's

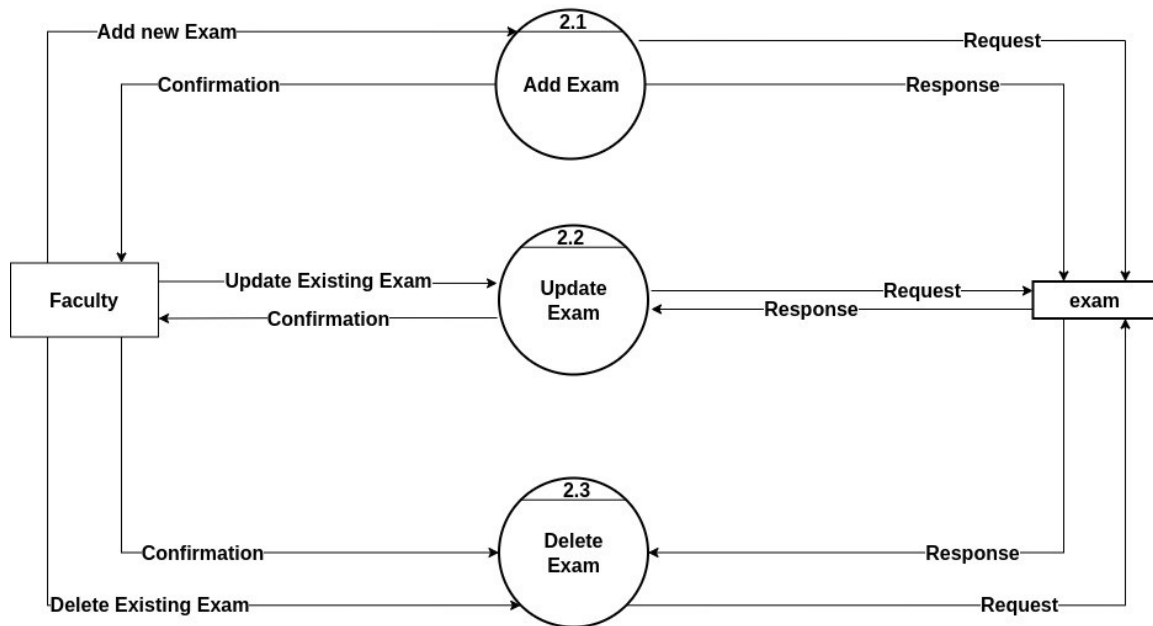


Figure 5.3.1 – DFD Level 2 diagram for manage exam

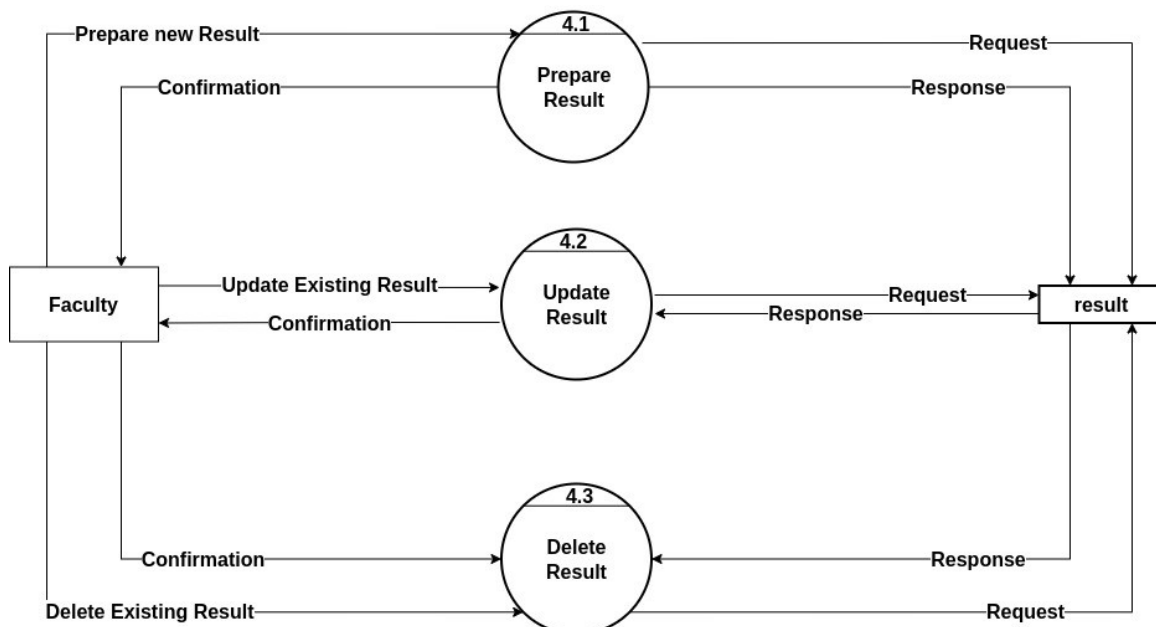


Figure 5.3.2 – DFD Level 2 diagram for manage result

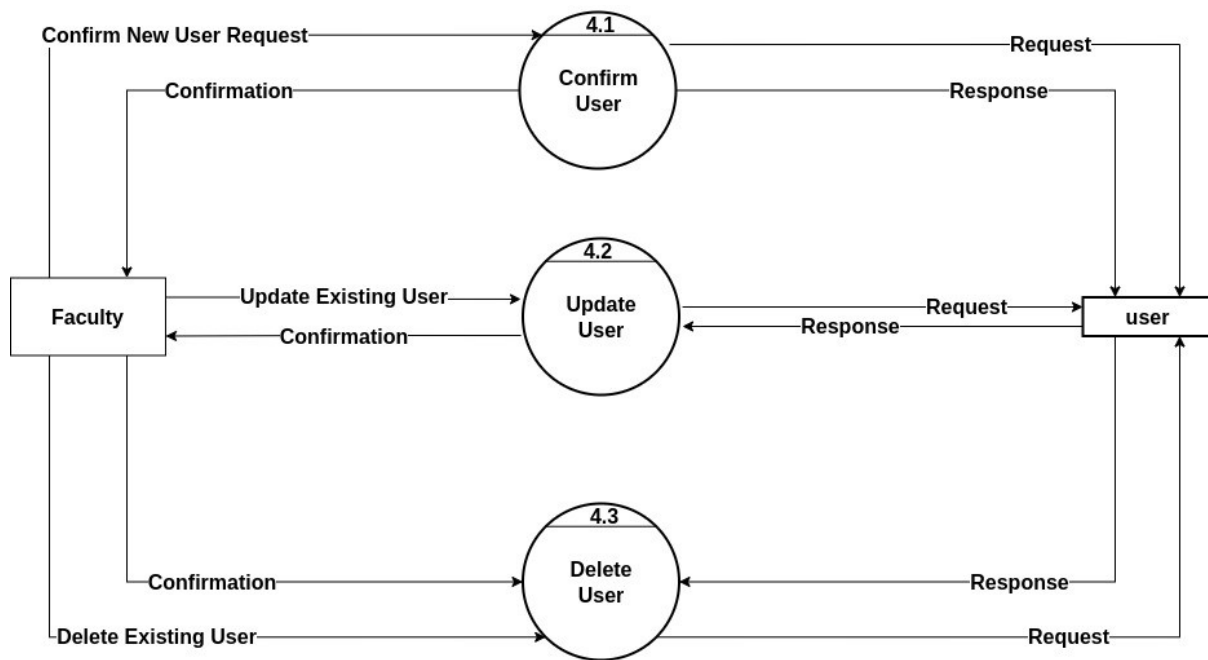


Figure 5.3.3 – DFD Level 2 diagram for manage user

6. Use Case Diagram

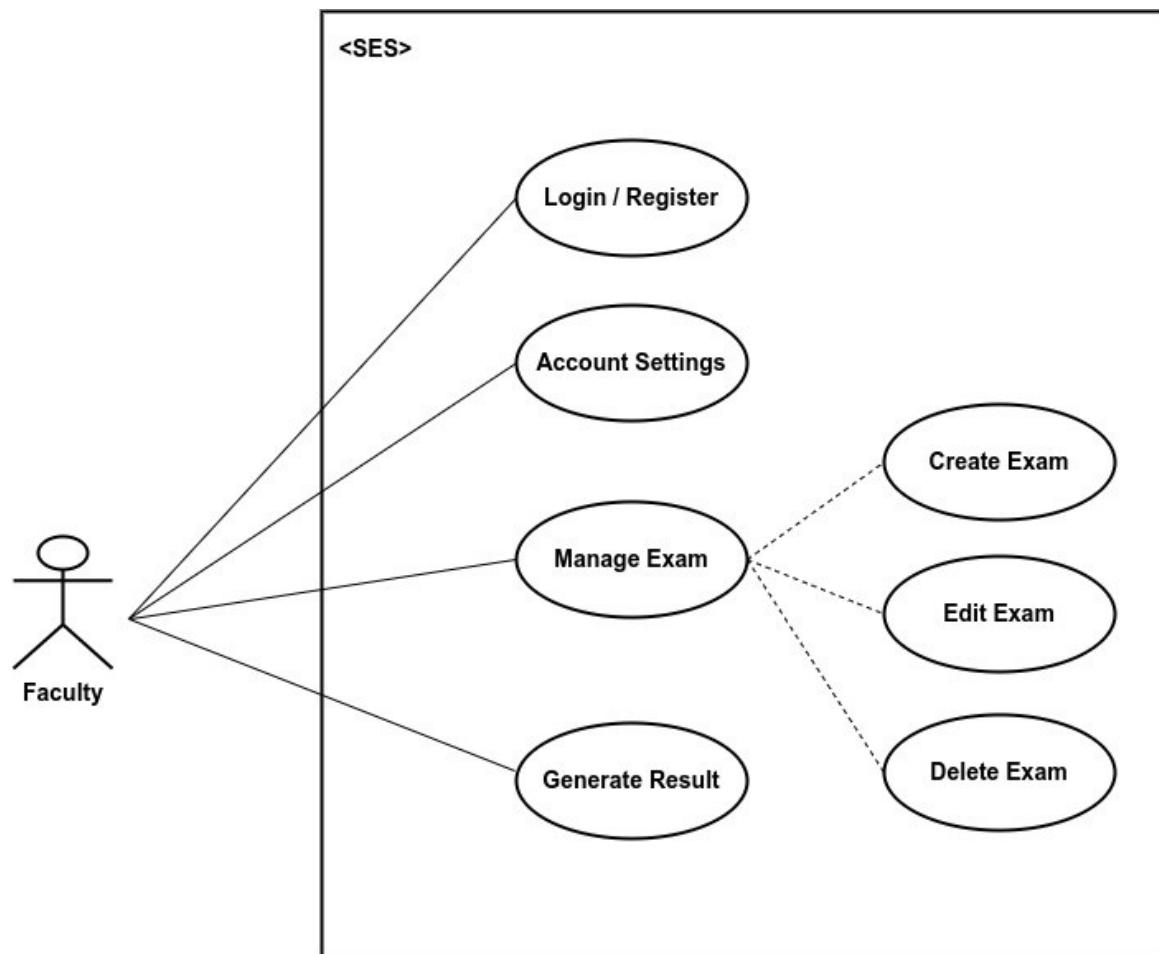


Figure 6.2 – faculty usecase diagram

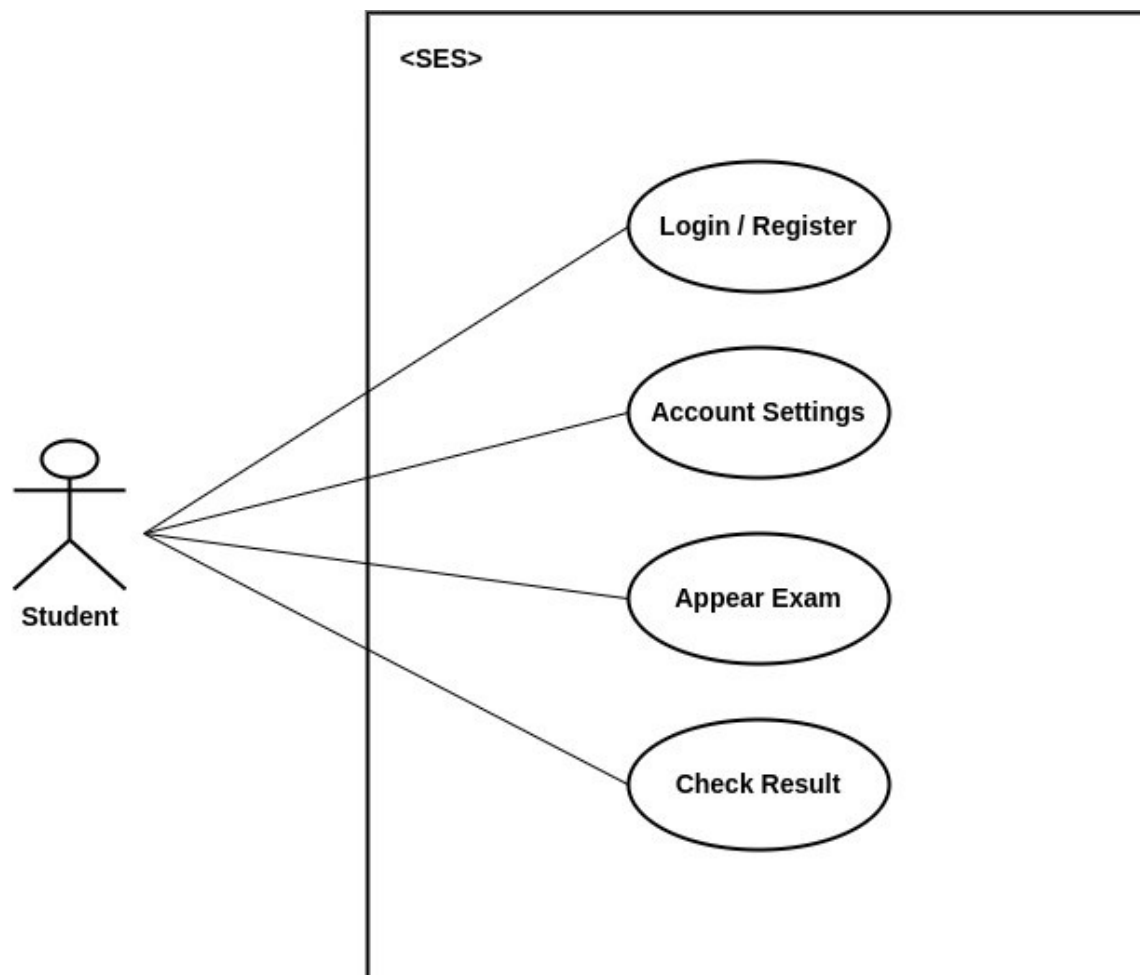


Figure 6.1 – student usecase diagram

7. Class Diagram

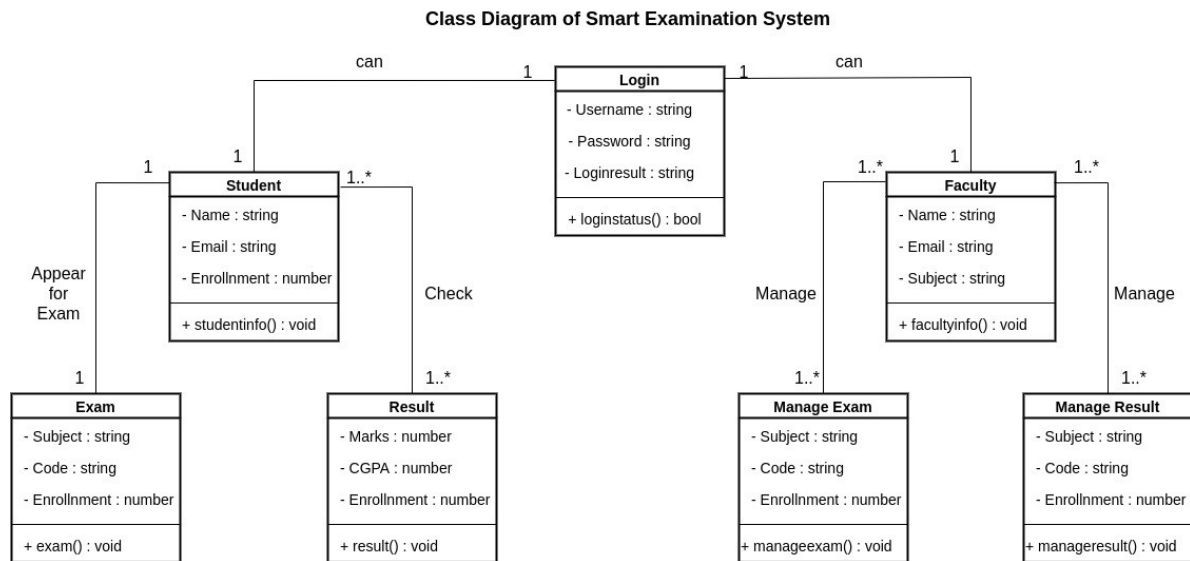


Figure 7 – class diagram

8. Activity Diagram

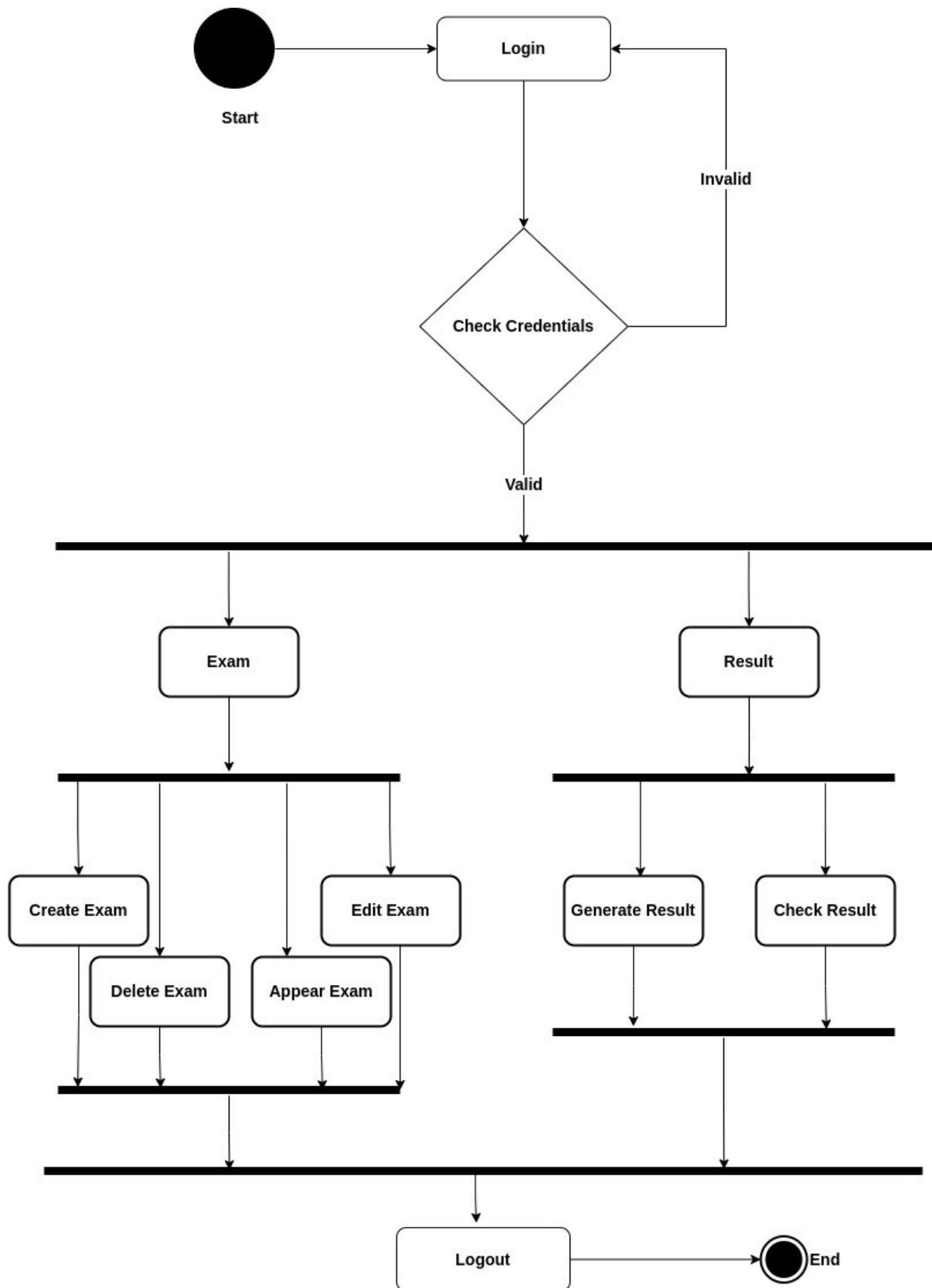


Figure 8 – activity diagram

8.1. Description of Activity Diagram

When System starts, then it ask for login, there is given two option of login, login via Faculty credentials, or login via Student credentials.

If there is a faculty login then he or she can manage all activities of Exam and Result, and if there is student login then he or she can appear for Exam and check his/her Result.

There is also a superuser in this system name as admin, admin can manage all the system features based on the Requirements.

Admin having the access to accept or block any kind of user, other than user, admin can't register himself in this system, admin account is prebuild account in this system.

9. E-R Diagram

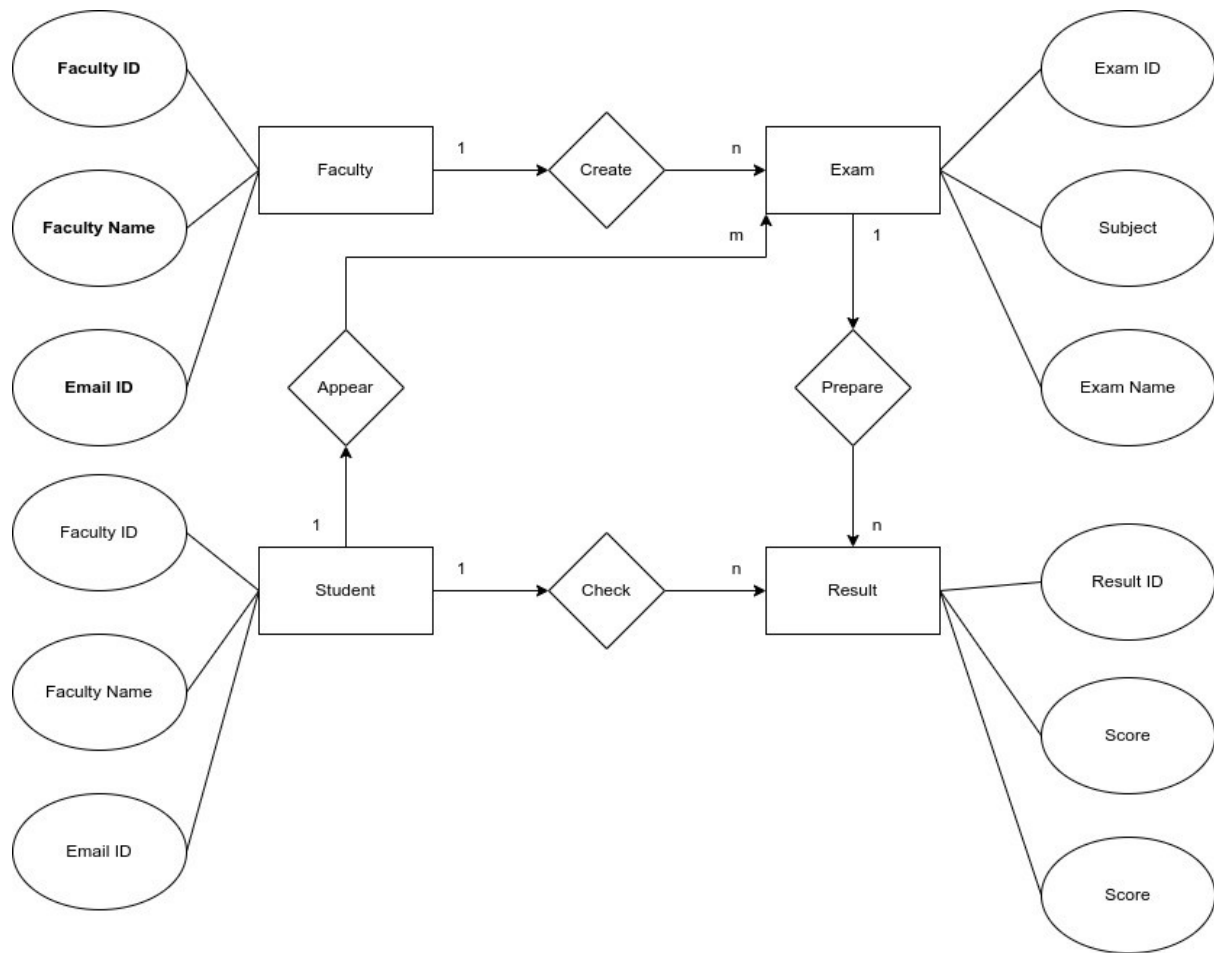


Figure 9 – Entity Relationship (E-R) Diagram

9.1. Description of E-R Diagram

In the smart examination system, every entity is connected to the superuser, and entities like exam and result is connected directly to students and faculty. Entities like department, subject and other small entities are not directly connected to students, but somehow indirectly connected to faculties. Basically in this system, faculties doesn't having access to delete the existed department and subjects and neither they can edit it, for do so they have to contact superuser. All System is dependencies are on these three users, but superuser takes the main role here.

Somehow this system also store all the logs of every user and they can manage by the superuser, so logs is also in direct relation with superuser but it is in indirect relation with faculty and student.

10. Data Dictionary

1. Login Table

In this Table System will ask to input correct Username and Password for Login into the System, then user can take benefit of this system.

Sr. No	Field Name	Datatype	Size	Description	Constraint	Example
1.	Username	varchar	20	Unique id of username	Primary Key	amankrs21
2.	Password	varchar	20	Password for unique id		*****

Table 10.1 – Login table fields

2. Registration Table

In this Table System will ask for some necessary data like username, password, subject, email etc. to register the user in this System.

Sr. No	Field Name	Datatype	Size	Description	Constraint	Example
1.	Name	varchar	20	Full name of the User		amankrs21
2.	Email	varchar	20	Email id will be considered as username.	Primary Key	amankrs21@yahoo.com
3.	Password	varchar	20	Password for unique id		*****
4.	Confirm Password	varchar	20	Must be same as password		*****
5.	Subject	varchar	10	For faculty only		Data Structure

Table 10.2 – Register Table fields

3. Exam Table

In this Table System will use these fields for preparing a exam.

Sr. No	Field Name	Datatype	Size	Description	Constraint	Example
1.	Exam_ID	varchar	20	ID of the Exam paper	Primary Key	python21
2.	Exam Name	varchar	20	Name of the Exam		Python Class Test
3.	Subject	varchar	20	Name of Subject		Python
4.	Subject Code	interger	10	Subject code of the subject		21345763
5.	Question_ID	varchar	20	ID of every questions while creating it	Foreign key	Q1512
6.	Faculty Name	varchar	20	Faculty name who created the exam		Aman Singh
7.	Date_Time	datetime	---	Date and Time of exam		12-07-2022, 12:00PM
8.	Total_Marks	integer	3	Marks of the student		78

Table 10.3 – Exam table fields

4. Result Table

In this Table System will show the result of the student by his/her id.

Sr. No	Field Name	Datatype	Size	Description	Constraint	Example
1.	Student_ID	varchar	20	ID of the student	Foreign key	student12
2.	Result ID	varchar	20	Result ID	Primary Key	result12
3.	Total_Marks	varchar	3	Marks obtain by student	Foreign Key	*****
4.	Perentage	varchar	4	Total % that a student got		*****
5.	Student name	varchar	20	Name of the student from student table		Ankit Singh

Table 10.4 – Result table fields

5. Faculty Table

In this Table, all the information related to faculty is stored in this system, like Name, subject he/she teaches, and many more.

Sr. No	Field Name	Datatype	Size	Description	Constraint	Example
1.	Name	varchar	20	Full name of the faculty		Aman Singh
2.	faculty_username	varchar	20	Username of the faculty must be unique	Primary Key	faculty21
3.	Password	varchar	20	Password for unique id		*****
4.	Confirm Password	varchar	20	Must be same as password		*****
5.	Address	varchar	100	Address of the faculty		Vadodara
6.	Subject	varchar	10	subject that he/she teaches.		Data Structure

Table 10.5 – Faculty table fields

6. Student Table

In this Table, all the information related to student is stored in this system, like Name, stream, in which he/she study and many more.

Sr. No	Field Name	Datatype	Size	Description	Constraint	Example
1.	Name	varchar	20	Full name of the Student		Ankit Singh
2.	student_username	varchar	20	Username of the student	Primary Key	student21
3.	Password	varchar	20	Password for unique id		*****
4.	Confirm Password	varchar	20	Must be same as password		*****
5.	Stream	varchar	10	Stream in which student is studying		BCA
6.	Address	varchar	100	Address of the student		Vadodara

Table 10.6 – Student table fields

10.1. Description of Data Dictionary

In the login Table user have to type username and password to use all the features of this System, for login user must be registered in this system, then they having access of Login. There are only two types of user in this system for login, Faculty and Students. There is also one superuser in this System which is Admin and manages all the System.

For registration user have to fill up all the required details which is asked by the system to fill, such as user's full name then user's email id which will be further taken as username, then user's subject (This is only for faculties), in this subject faculties have to fill for which subjects they are going to take test.

After successful registration user can login into the system from login portal.

11. Form Design (Screenshots Phase 1 ,2,3,4 & validation's screenshots)

11.1. Development Phase -1

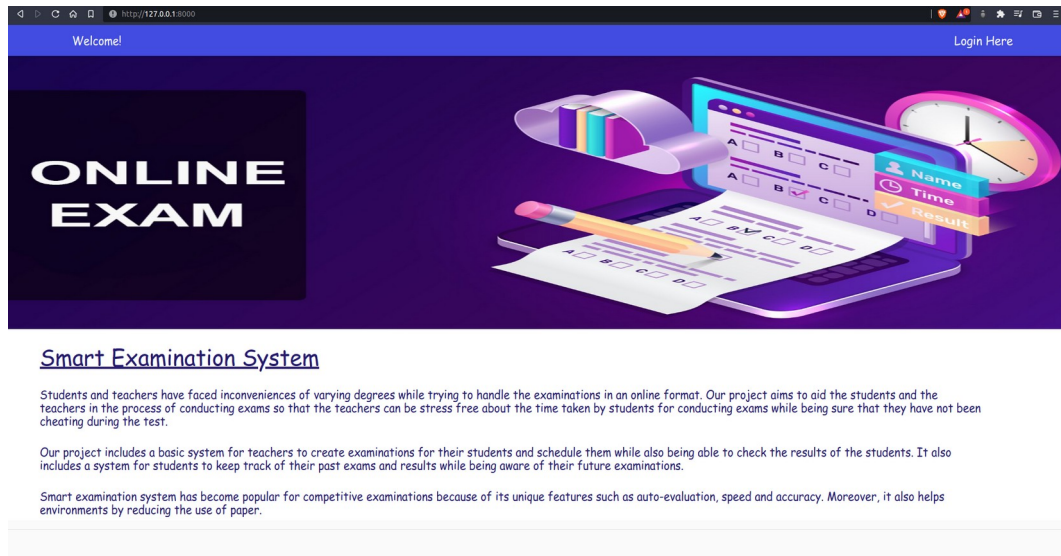


Figure 11.1.1 – Homepage of the system

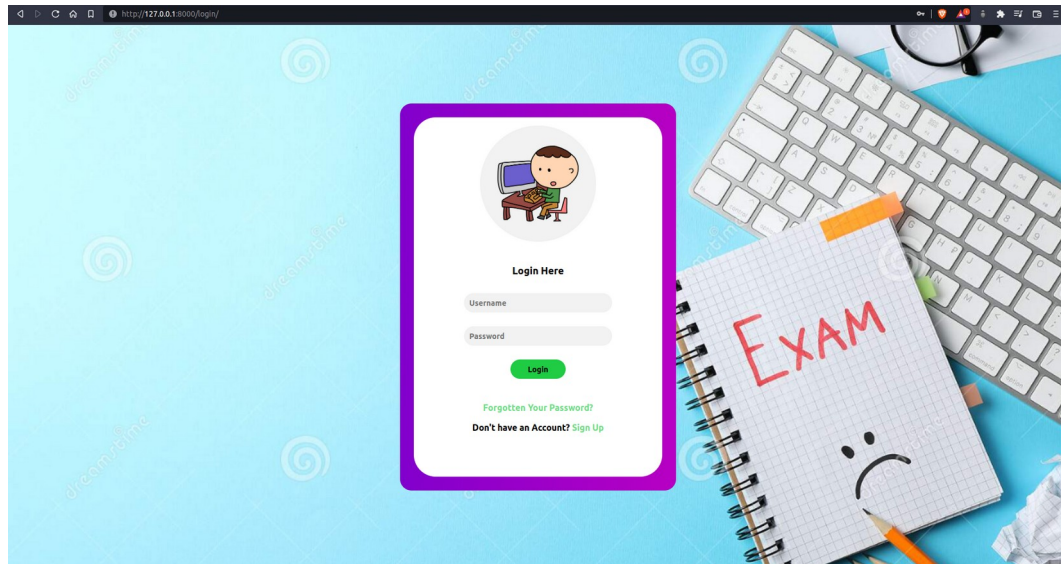


Figure 11.1.2 – Login page of the system

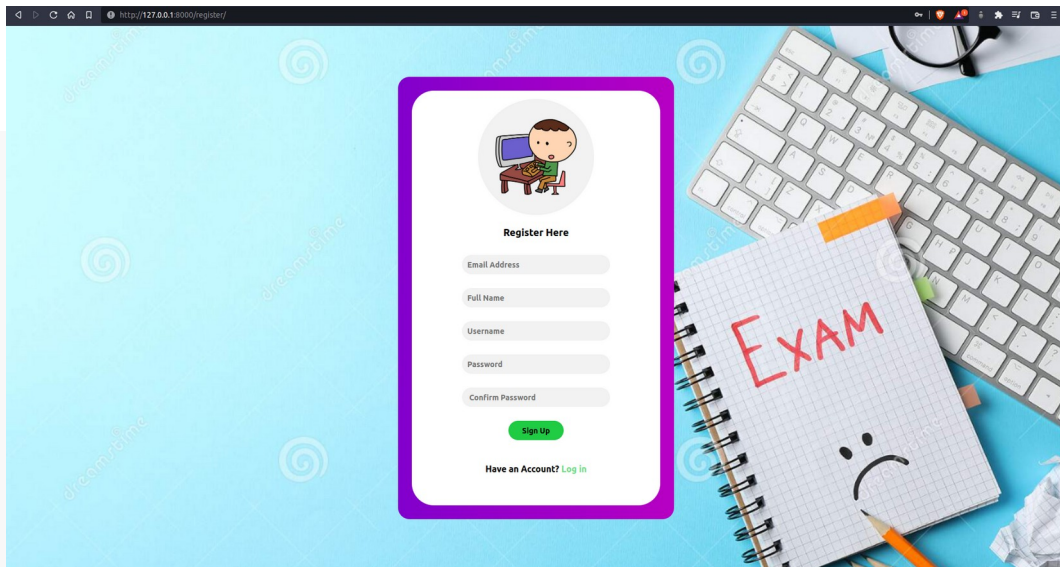


Figure 11.1.3 – registration page of the system

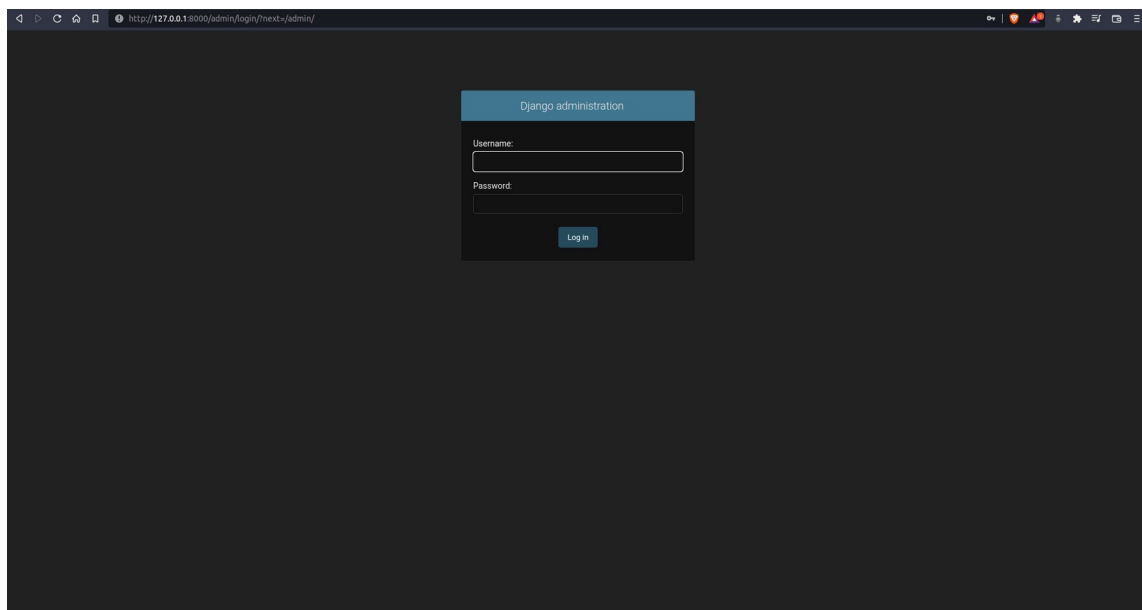


Figure 11.1.4 – Superuser login page of the system

11.2. Development Phase -2

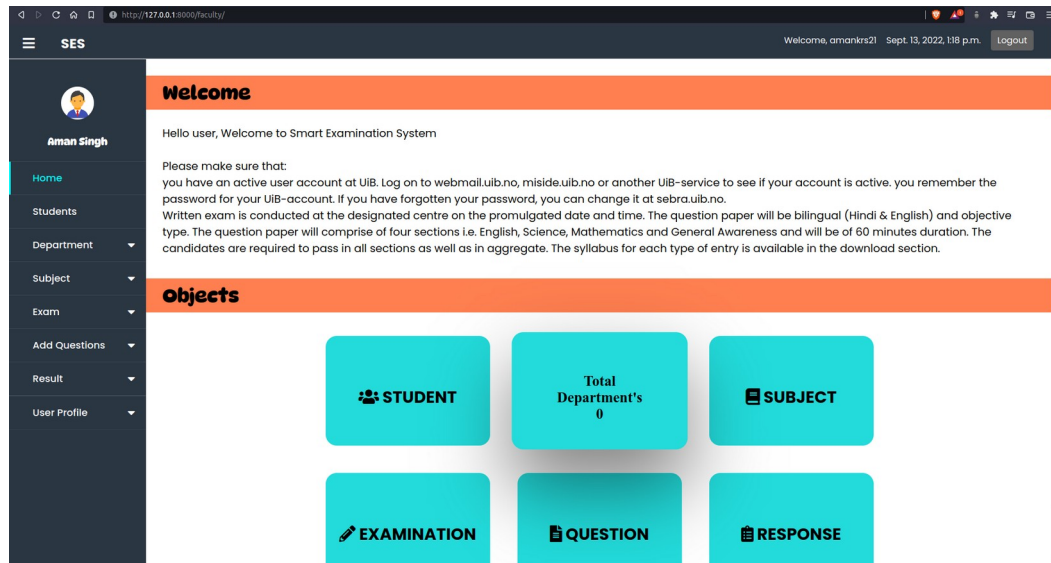


Figure 11.2.1 – Faculty dashboard

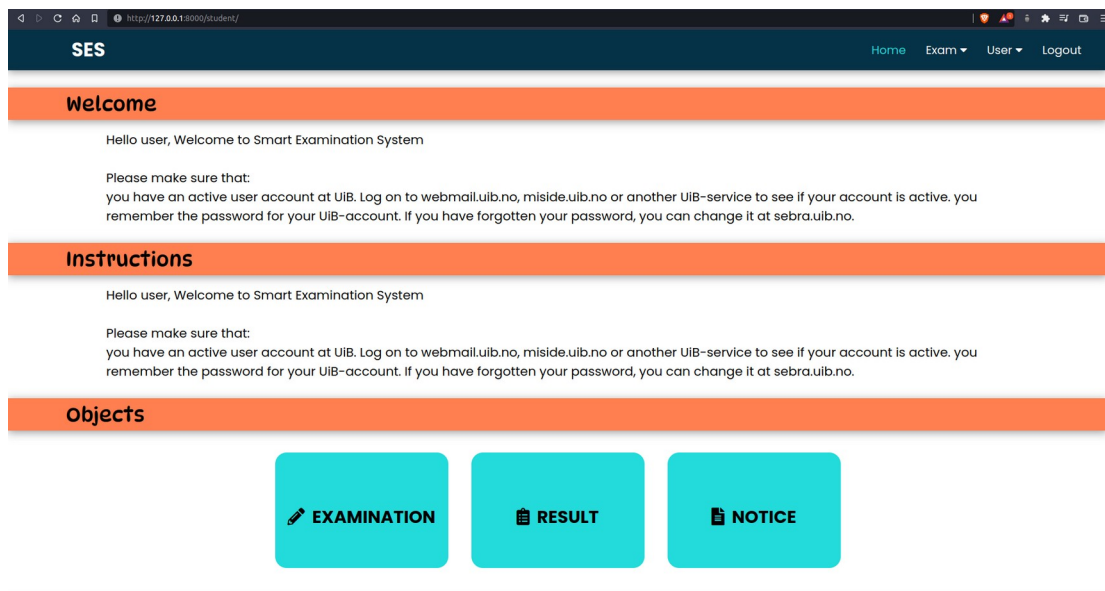


Figure 11.2.2 – Student dashboard

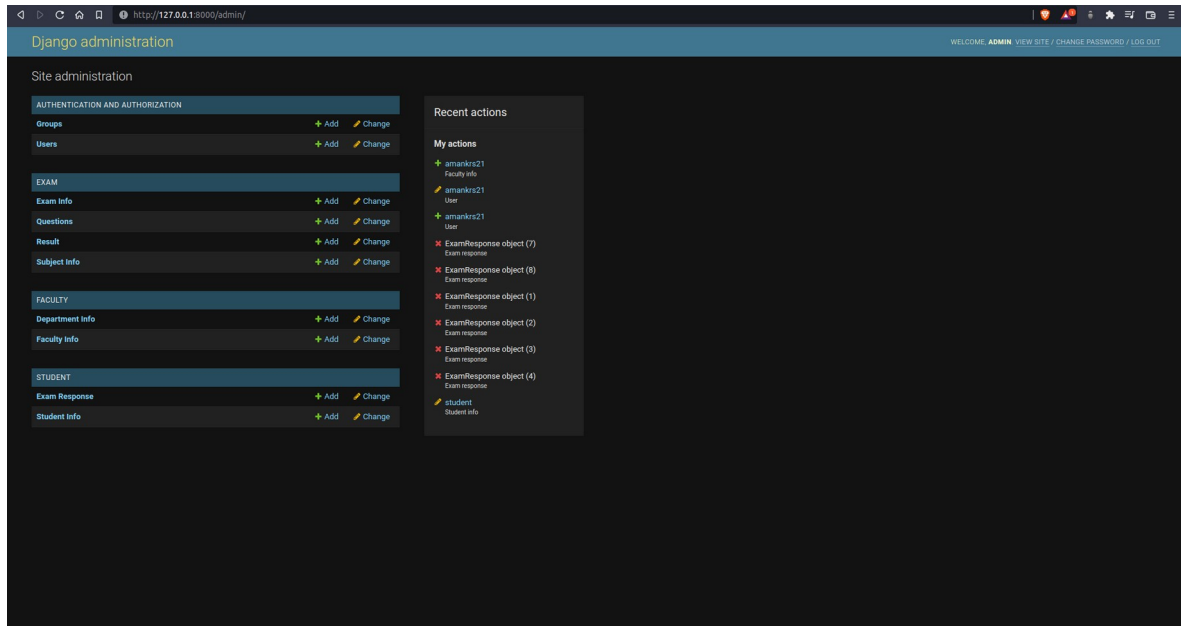


Figure 11.2.3 – Superuser Dashboard

11.3. Development Phase -3

The screenshot shows the 'Exam Details' form in the SMART Examination System. The form is titled 'Exam Details' and includes a red asterisk warning: '* Please select start Date and Time for exam in corresponding field'. The form fields are as follows:

- Total Marks :** A text input field with the value 'Marks'.
- Select Department :** A dropdown menu with a dashed line indicating a selection.
- Select Exam Type :** A dropdown menu with a dashed line indicating a selection.
- Select Subject :** A dropdown menu with a dashed line indicating a selection.
- Exam Start Time :** A text input field with the value '2022-09-15 02:51:38'.
- Exam End Time :** A text input field with the value '2022-09-15 02:51:38'.

Below the form fields is a green 'ADD' button. The left sidebar contains a menu with options: Home, Students, Department, Subject, Exam, Add Questions, Result, and User Profile. The top navigation bar shows the user is logged in as 'Hello, 10:57:13 & 15/8/2022' with a 'Logout' button. The footer indicates '© 2022 SES (Contributed by Aman Singh)'.

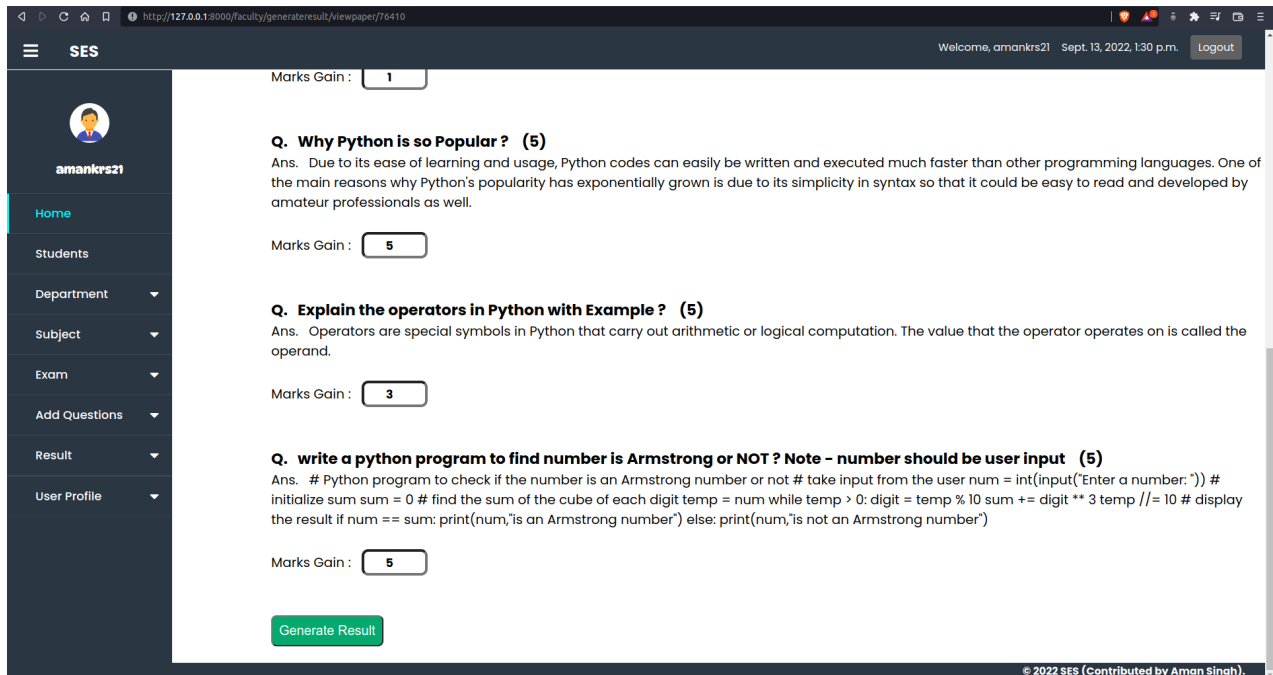
Figure 11.3.1 – Create an Exam at faculty side

The screenshot shows the 'Exam view' at the student side. The exam title is 'BScIT Internal Exam Python 2022-09-13'. The department is 'BScIT' and the subject is 'Python'. The total marks are '20'. The time left is '119 mins 50 seconds'. Below this, there are four objective type questions:

- Q. What is Python ? (1)**
 - ☐ software
 - ☐ hardware
 - ☐ programming language
 - ☐ none
- Q. What is the maximum possible length of an identifier? (1)**
 - ☐ 16
 - ☐ 32
 - ☐ 64
 - ☐ none
- Q. Who developed the Python language? (1)**
 - ☐ Zim Den
 - ☐ Guido van Rossum
 - ☐ Wick van Rossum
 - ☐ Niene Storn
- Q. In which language is Python written? (1)**
 - ☐ C
 - ☐ PHP

Figure 11.3.2 – Exam view at student side

11.4. Development Phase -4



The screenshot shows the 'SES' (Smart Examination System) interface for a faculty member. The top navigation bar includes a hamburger menu, the 'SES' logo, and a welcome message 'Welcome, amankrs21' with the date 'Sept. 13, 2022, 1:30 p.m.' and a 'Logout' button. The left sidebar contains a user profile for 'amankrs21' and a menu with options: Home, Students, Department, Subject, Exam, Add Questions, Result, and User Profile. The main content area displays three questions with their respective answers and marks gained. Each question has a 'Marks Gain' input field. A 'Generate Result' button is located at the bottom of the main content area. The footer indicates '© 2022 SES (Contributed by Aman Singh)'.

Marks Gain :

Q. Why Python is so Popular ? (5)
 Ans. Due to its ease of learning and usage, Python codes can easily be written and executed much faster than other programming languages. One of the main reasons why Python's popularity has exponentially grown is due to its simplicity in syntax so that it could be easy to read and developed by amateur professionals as well.

Marks Gain :

Q. Explain the operators in Python with Example ? (5)
 Ans. Operators are special symbols in Python that carry out arithmetic or logical computation. The value that the operator operates on is called the operand.

Marks Gain :

Q. write a python program to find number is Armstrong or NOT ? Note - number should be user input (5)
 Ans.

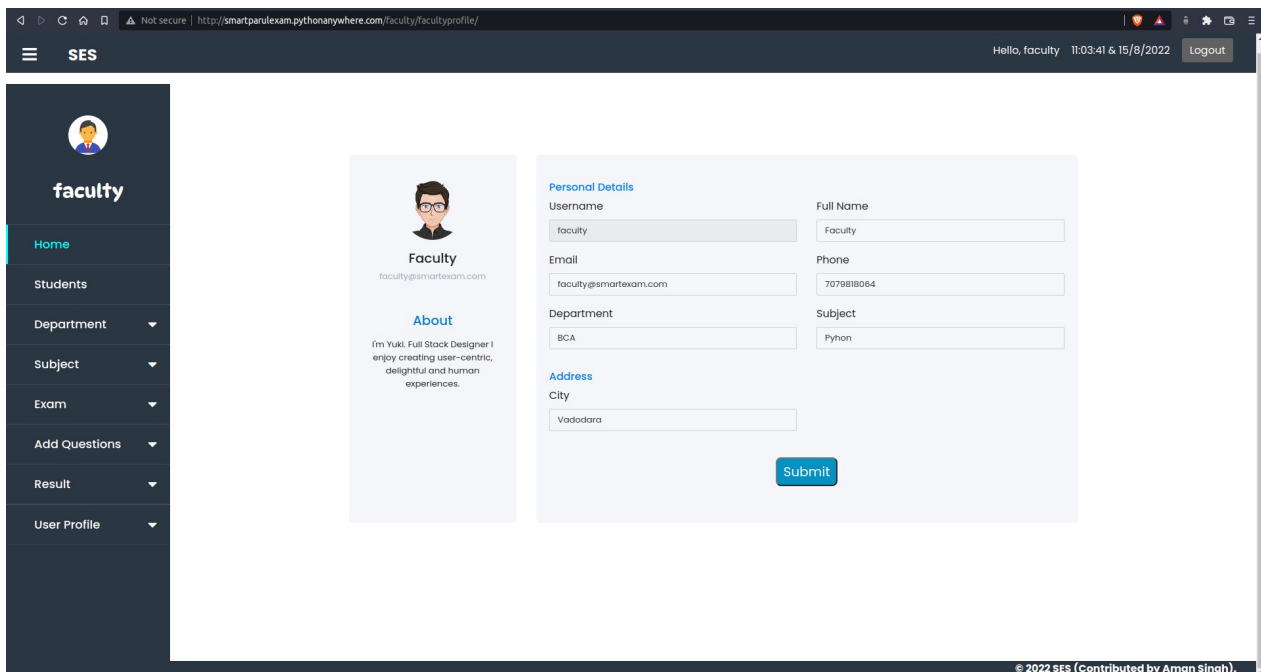
```
# Python program to check if the number is an Armstrong number or not # take input from the user num = int(input("Enter a number: ")) # initialize sum sum = 0 # find the sum of the cube of each digit temp = num while temp > 0: digit = temp % 10 sum += digit ** 3 temp //= 10 # display the result if sum == num: print(num,"is an Armstrong number") else: print(num,"is not an Armstrong number")
```

Marks Gain :

[Generate Result](#)

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Figure 11.4.1 – check paper & generate result at faculty side



The screenshot shows the 'SES' (Smart Examination System) interface for a faculty member's profile. The top navigation bar includes a hamburger menu, the 'SES' logo, and a welcome message 'Hello, faculty' with the date '11:03:41 & 15/8/2022' and a 'Logout' button. The left sidebar contains a user profile for 'faculty' and a menu with options: Home, Students, Department, Subject, Exam, Add Questions, Result, and User Profile. The main content area displays the faculty member's profile, including a profile picture, name, email, department, subject, and address. A 'Submit' button is located at the bottom of the main content area. The footer indicates '© 2022 SES (Contributed by Aman Singh)'.

Personal Details

Username: Full Name:

Email: Phone:

Department: Subject:

Address

City:

[Submit](#)

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Figure 11.4.2 – Profile view at faculty side

12. What is testing?

Testing documentation is the documentation of artifacts that are created during or before the testing of a software application. Documentation reflects the importance of processes for the customer, individual and organization. Projects which contain all documents have a high level of maturity. Careful documentation can save the time, efforts and wealth of the organization.

Once the test document is ready, the entire test execution process depends on the test document. The primary objective for writing a test document is to decrease or eliminate the doubts related to the testing activities.

12.1. Importance and types of testing

We have various types of test document, which are as follows:

- Test scenarios
- Test case
- Test plan
- Requirement traceability matrix(RTM)
- Test strategy
- Test data
- Bug report
- Test execution report

13. Future Enhancement

In future enhancement, we will add a feature for supervision time table for Exam, which will auto generate according to the given data.

We will also add a feature, which will generate a PDF file for the result, which can be further print.

In future, we will also add a feature in which student can run their code while giving exam and marks will be given automatically same as objective type question.

We will always try to fix bug time to time, which makes this system more efficient.

We will also try improve the UI as clean as possible that can help user to easily use this system.

We will try to add some automation in this system that can reduce the burden of the faculties.

14. References & Bibliography

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2. <https://docs.djangoproject.com/en/4.1/>
3. <https://dev.mysql.com/doc/>
4. <https://github.com/>
5. <https://stackoverflow.com/>
6. <https://www.quora.com/>
7. <https://docs.microsoft.com/en-us>
8. <https://www.geeksforgeeks.org/>
9. <https://www.khanacademy.org/>

Book:

1. Django in Advanced
2. SQLite3 Helping Hand

Other Resources:

1. Some Journals
2. YouTube