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# Facial Recognition Technology Using Azure API

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**ABSTRACT:** Facial recognition technology allows users to register and login into the system by using face recognition. This system registers the user with an email id and an image that is uploaded or captured for authorization instead of a password. the registered email id and image will be stored in the database. At the time of login, the user gives an email id and new image which is compared with the one stored in the database.

When the user registers by giving email id and the image the UI sends the request to the server API to register, the server reads data and send the request to the face API the azure API detects the image and sends a response with the image ID to the server API which then stores image id and email into the database. When the user login by giving email id and the image then the server API sends that image with the data available in the database to the azure API which compares them and gives the confidence level in response, based on that confidence level the server API can allow the user to login into the system.

## I. INTRODUCTION

Passwords are the most common form of authentication used to control access to information. they are widely used because they are simple, inexpensive, and convenient mechanisms to use and implement. At the same time, passwords are also recognized as being an extremely poor form of protection. passwords are quite a poor security tool, while facial recognition technology can improve the situation because it includes information, not about something we know, but something we are. Facial recognition is a way of identifying or confirming an individual's identity using their face.

The product allows users to register and login into the system by using face recognition. This system registers the user with an email id and an image that is uploaded or captured for authorization instead of a password. the registered email id and image will be stored in the database. At the time of login, the user gives an email id and new image which is compared with the one stored in the database.

When the user registers by giving email id and the image the UI sends the request to he server API to register, the server reads data and send the request to the face API the azure API detects the image and sends a response with the image ID to the server API which then stores image id and email into the database. when the user login by giving email id and the image then the server API sends that image with the data available in the database to the azure API which compares them and gives the confidence level in response, based on that confidence level the server API can allow the user to login into the system.

## II. LITERATURE REVIEW

Here, we have illustrated some related works which have been conducted by the researchers previously. We have studied the research works and tried to find out the limitations of the researches. Such as Yogesh Maniktala et al. proposed a Robust Technique of Face Recognition [2]. In this research, they have described the face detection process and recognition systems using pixels and analyzing the images. Smriti Tikoo et al. developed a Face detection System using Viola-Jones and Recognition system using Back Propagation Neural Network [3]. In this paper, facial detection has been carried out using the Viola-Jones algorithm, and recognition of the face has been done using Back Propagation Neural Network (BPNN). Dr. Nita Thakare et al. have carried research on "Face Detection and Recognition for Automatic Attendance System" [4]. In this research, they have described their experience in developing

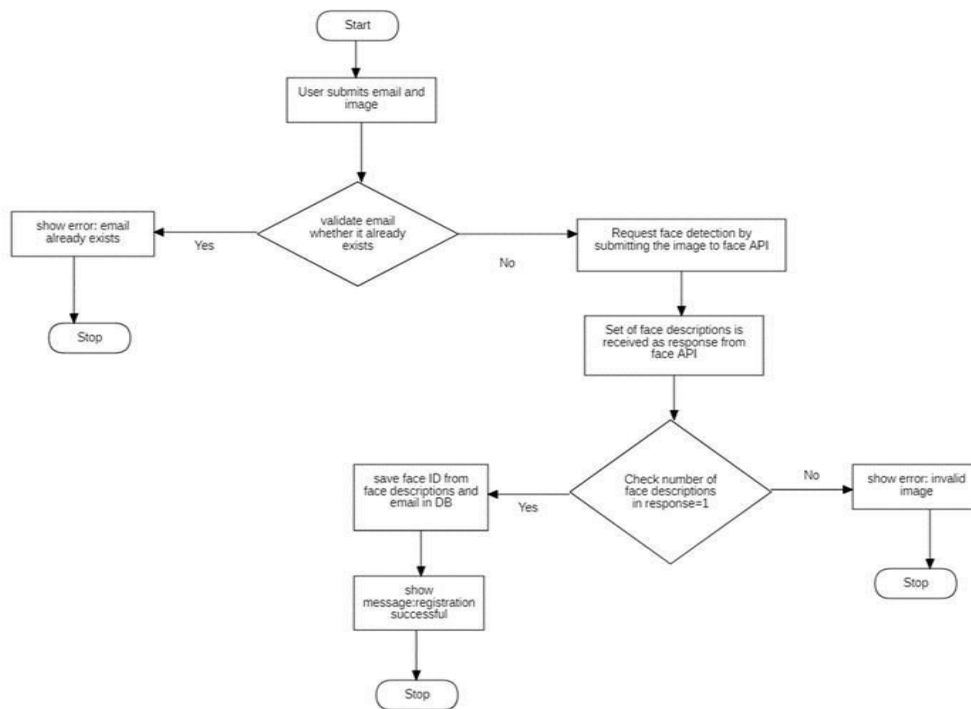
face detection and recognition system for attendance software. Gunjan Mehta et al. was introduced a Face Recognition System using PCA, FLDA, and Artificial Neural Networks [5]. The paper presented a technique to implement a system that aims to describe four different methodologies for Face Recognition. There is another paper where neural a network is also used for detecting a face.

### III. PROPOSED SYSTEM

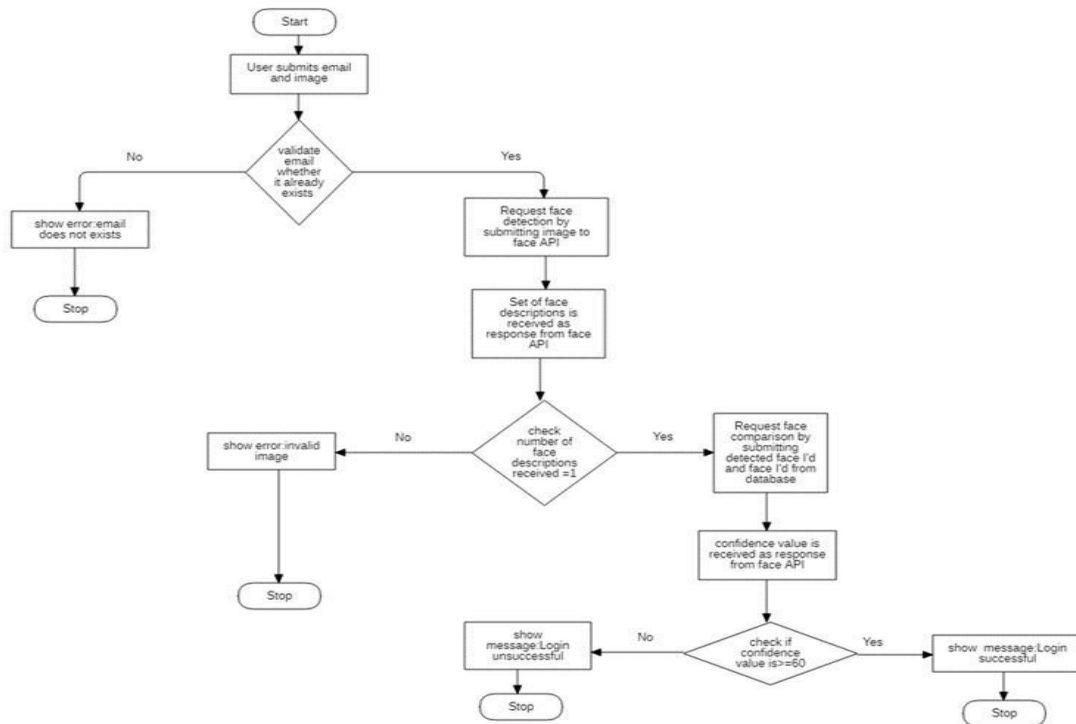
The proposed system is a web application that allows users to register and login into the system by using face recognition technology. When the user registers by giving the email id and the image the user interface sends the request to the server API to register, the server reads data and sends the request to the Azure API, the azure API performs face detection operations on the image and generate data related to the image. This data is sent to the server API, which then stores that data along with email into the database. when the user interface sends the request to login by giving the email id and the image then the server API sends that image with the data available in the database to the azure API, the azure API performs face detection operations on the new image and compares it with the data of the previous image and gives the confidence level on both the images to the server API, if the confidence level is more than 60 % then the server API allows the user to enter the system.

### SOFTWARE ARCHITECTURE

Flowchart of Register page:



Flowchart of Register page:



### IMPLEMENTATION

Modules:

There are four modules in the application.

1. Client/UI
2. Server
3. DataBase
4. FaceAPI

#### 1. Client/UI:

- Client/UI is the User interface of the system.
- It reads emails and images submitted by the user.
- Validates the email if the email is valid then it sends a registration request to the server, if it is not valid then displays the error message “Enter valid email”.
- It receives messages from the server whether the registration is successful or not.

#### 2. Server:

- Receives register requests from a client with email and image as input.
- It checks in DB for email existence by sending a query for the email object.
- If the DB sends an email object as a response that means email already exists, the server sends an error message to the client “Email already exists”.
- If the server receives an empty object as a response that means email does not exist.
- the server sends register requests to face API with the image as input to detect face descriptions.
- It receives face descriptions from face API as a response.
- a number of face descriptions are validated whether the descriptions are
- of one face or multiple faces or incomplete face descriptions.
- if it is multiple or incomplete face descriptions then an error message is sent to the client “invalid image”.
- if it is single face descriptions then it saves face id and email in DB and also sends a message to the client “Registration successful”.

**3. DataBase:**

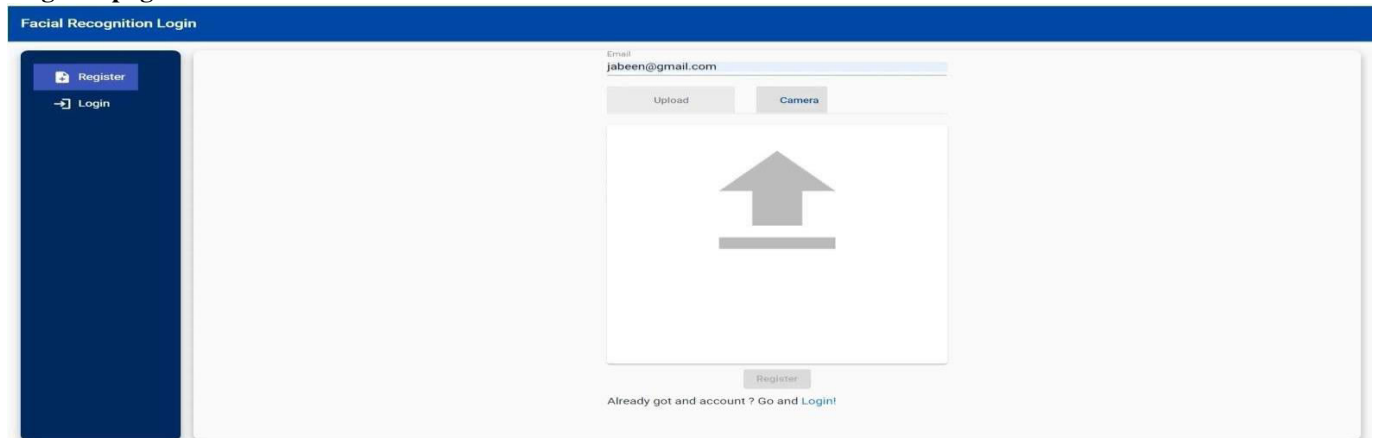
- It receives queries from the server to check for email existence.
- If the email exists then it responds with the email object if it does not exist then it responds with an empty object.
- It receives queries to save email and face id in DB.
- It saves and replies to the server “saved successfully”.

**4. Face API:**

- It receives detection requests for the image from the server.
- It performs detection operations on the image and generates face descriptions and face Id.
- it sends face descriptions and face ID as a response to the server.

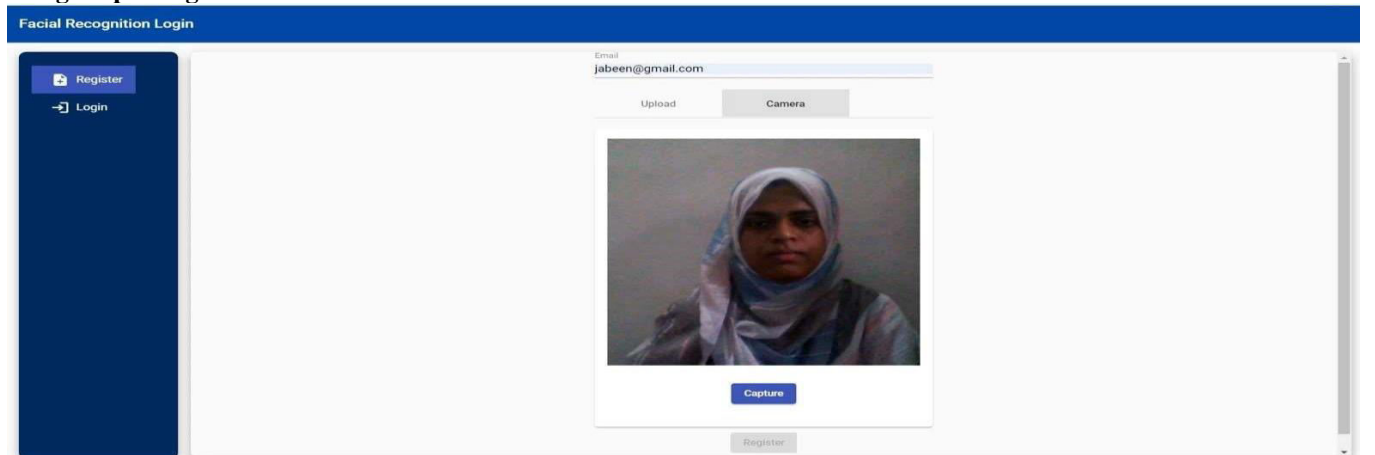
**OUTPUT SCREENSHOTS**

**Register page:**



**User Enters details:**

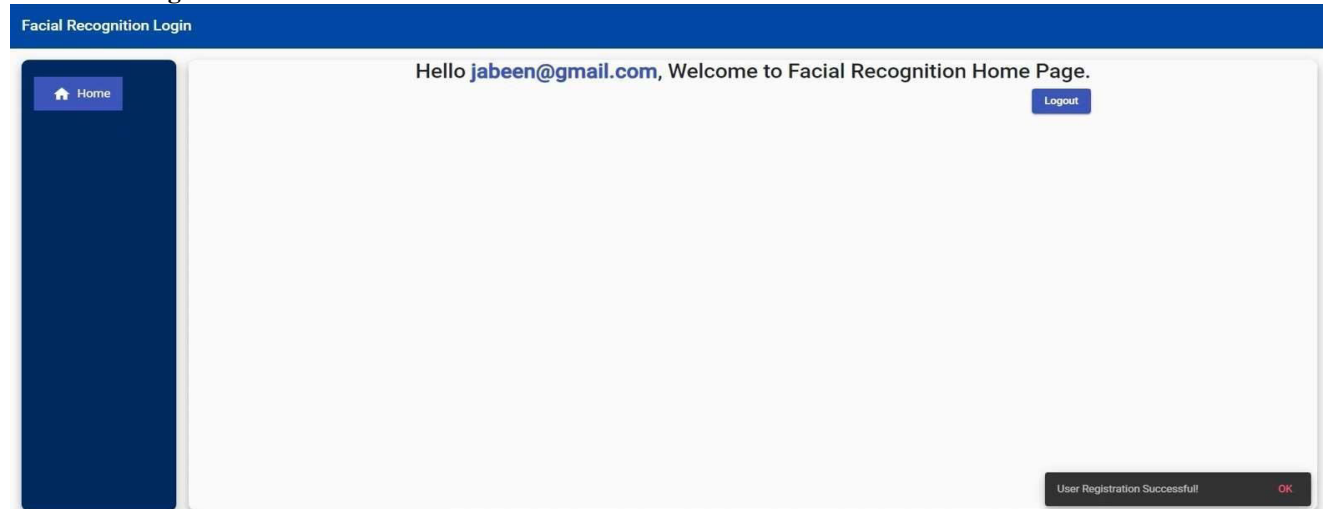
**Image capturing with camera:**







### Successful Registration:

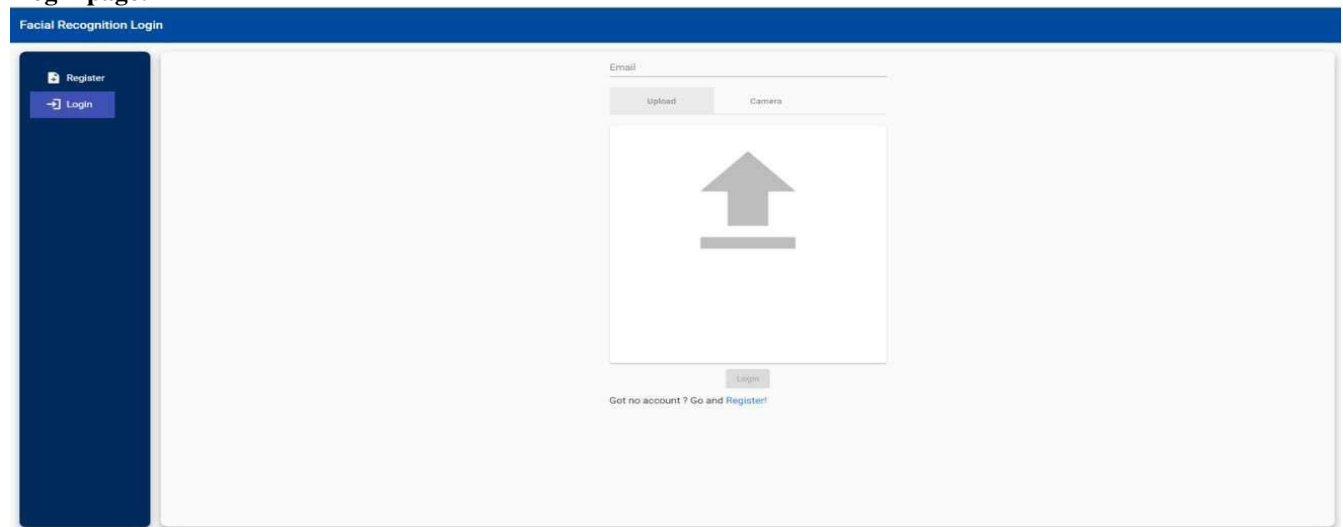


Invalid email:

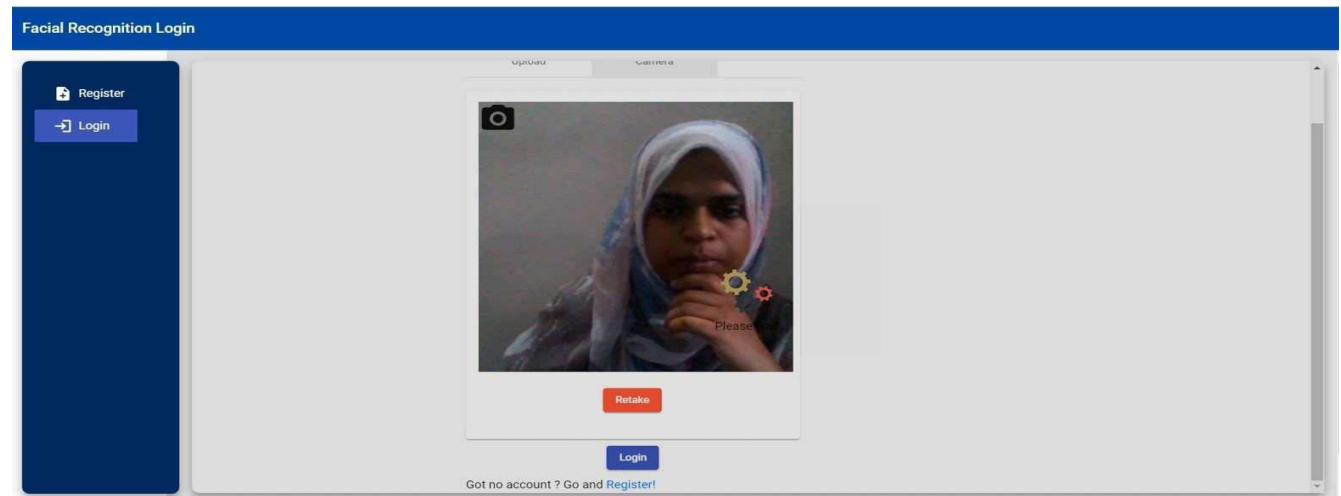
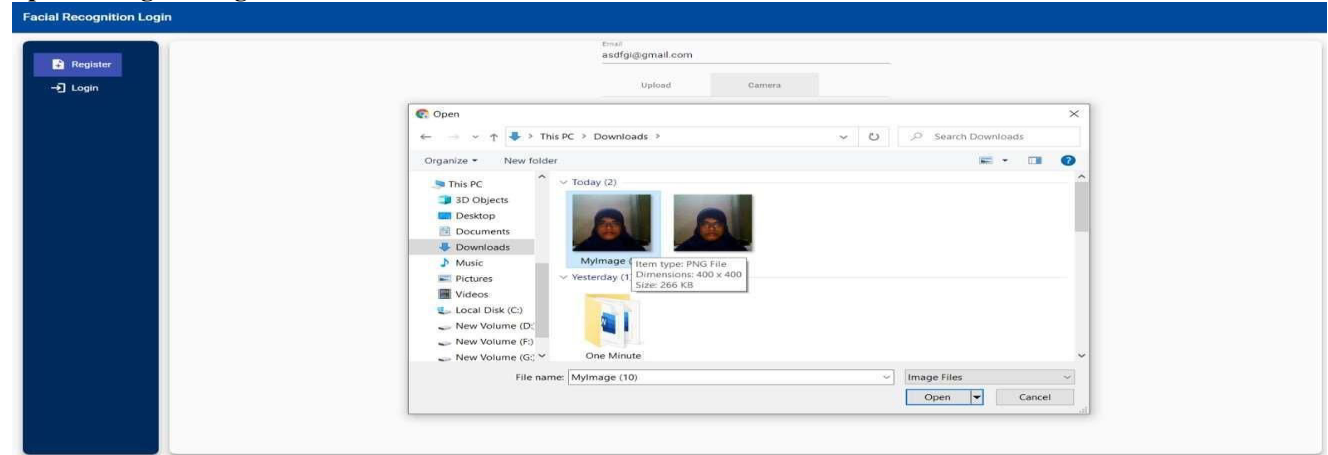
Existing User

Invalid image:

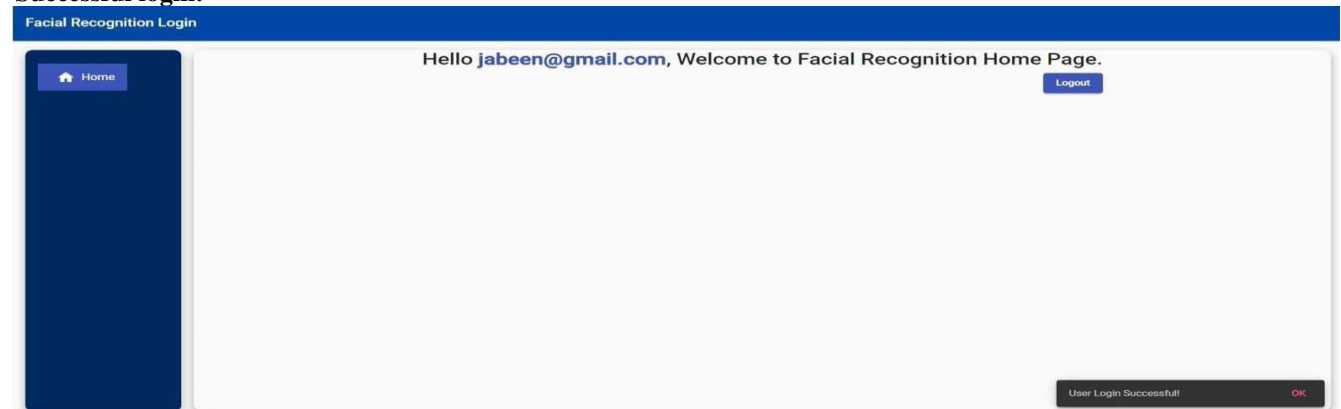
### Login page:



Upload image for login:



Successful login:



Invalid image:

Image or email did not match:



#### IV. CONCLUSION

Facial recognition technology is a smart way of registration and login into a web application. the API used in development work efficiently in recognizing and detecting the images which work as a password to the web application. The application was

designed in such a way that future modifications can be done easily.

it is effective in detecting the faces in the image and also whether the image is a valid input or not. the threshold value is set to 60% and it can be increased or decreased based on requirement.

However the application might not be very accurate in recognizing faces with exact face descriptions such as Twins. for that the threshold value can be increased.

the UI of this application is angular based web page it can also be changed to any other UI. the backend of the application is designed in a way that it can used with different User interfaces.

Testing is done on application with various types of inputs and the application works accurately on all kinds of valid and invalid input and it is able to give the appropriate response.

The System has adequate scope for modification in future if it is necessary.

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