

Project Design

Project: Poster Evaluation using Machine learning

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Revision History

Revision Number	Date	Summary of Changes	Author(s)
1.0	09-21-2023	Class diagram	Vadaparthi Jyothirmai, Siddareddy Tejaswi Reddy, Ashritha Battula
2.0	09-22-2023	Changes to Class diagram ER Diagram Information Architecture Diagram	Vadaparthi Jyothirmai, Siddareddy Tejaswi Reddy Bhavana Bayyapu
3.0	09-23-2023	Finalize class Diagram and Er Diagram User interface wireframe- Figma	Vadaparthi Jyothirmai, Tejaswi Reddy siddareddy Jagruthi pullaiahgari
4.0	09-24-2023	Sequence diagram 1to 4 User interface wireframe- Figma Design Rationale	Vadaparthi Jyothirmai, Tejaswi Reddy Siddareddy Jagruthi pullaiahgari Bhavana Bayyapu Ashritha Battula
5.0	09-25-2023	Design Rationale	Ashritha Battula Tejaswi Reddy Siddareddy Vadaparthi Jyothirmai

Sequence diagram 5 to 9

Tejaswi Reddy Siddareddy
Vadaparthi Jyothirmai

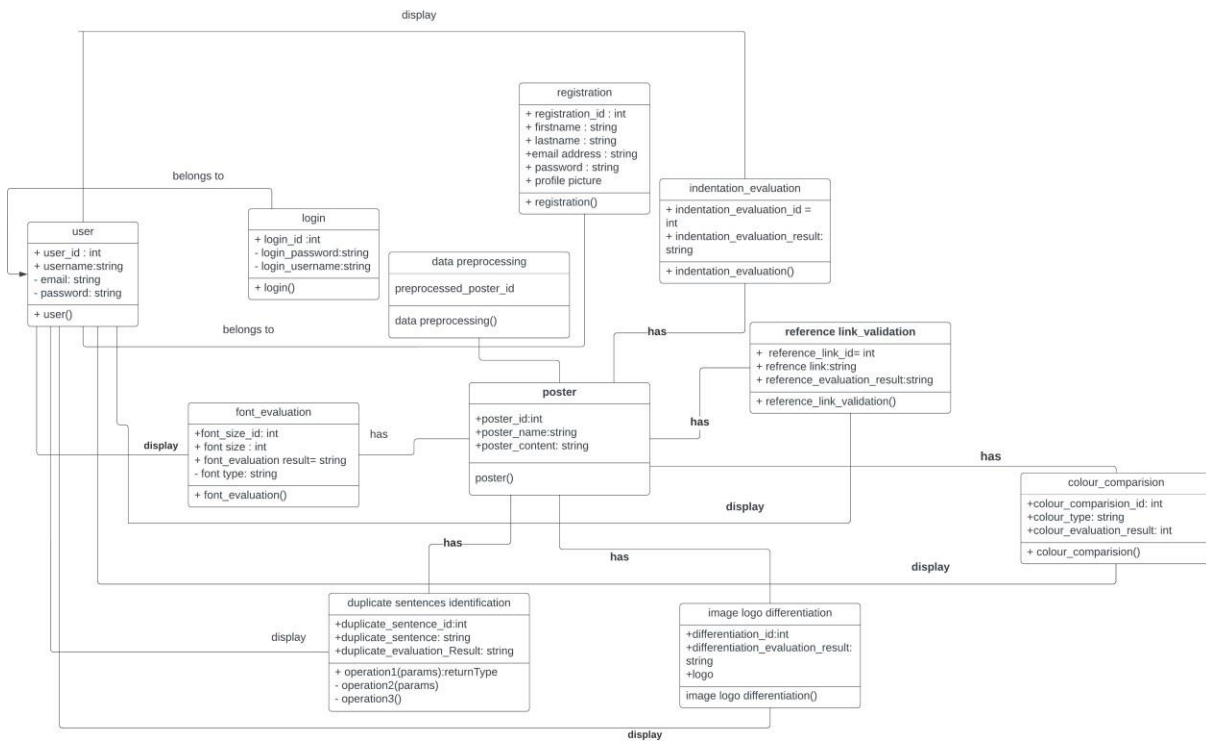
User interface wireframe-
Figma

Jagruthi pullaiahgari
Bhavana Bayyapu

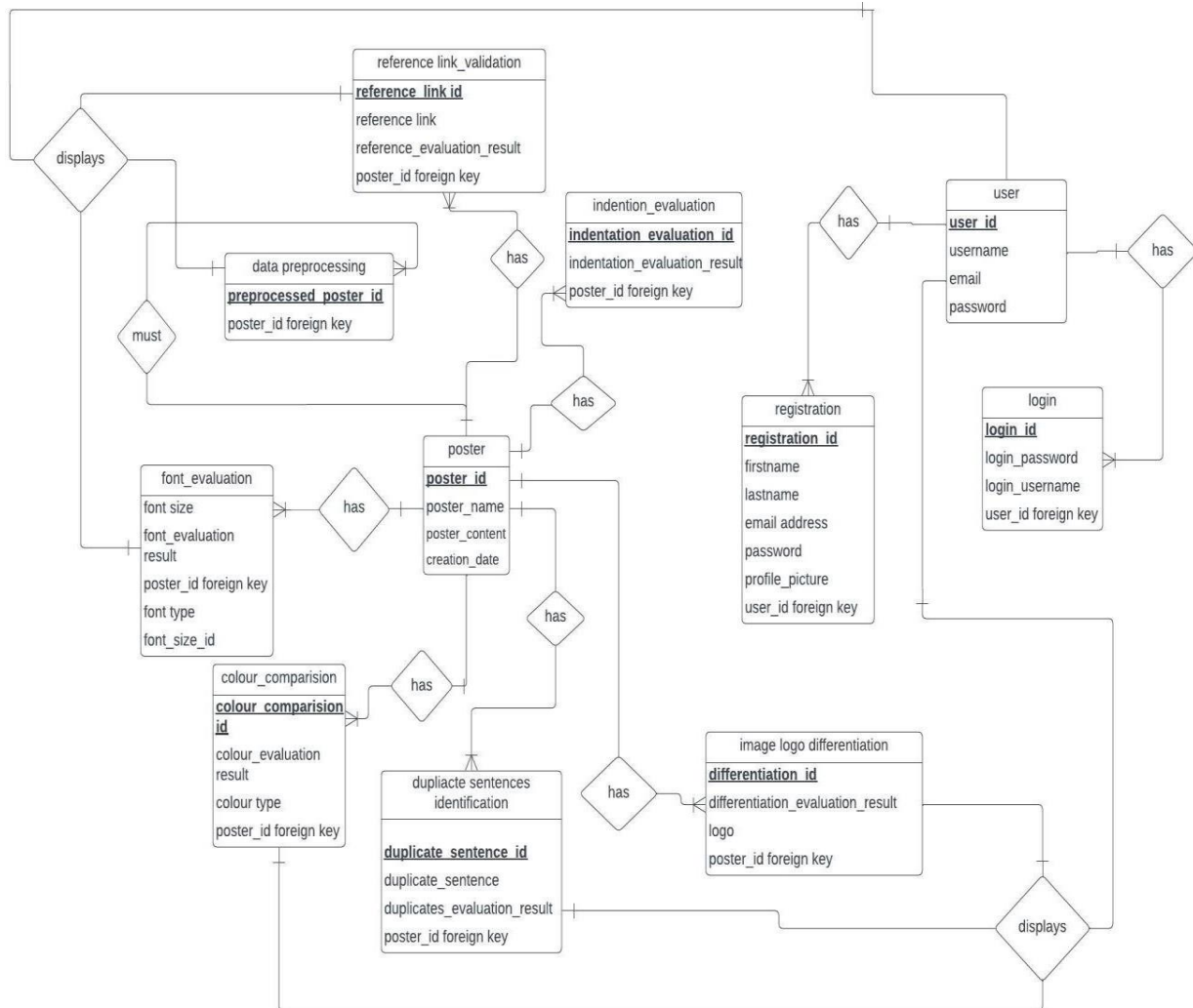
Class Diagram

- **User class** – This class has the information of all the users who have registered on the website. It has all the details of the user like user_id, username, email id and password. It has two parts login () and registration () classes
- **Registration class** - First time users must register themselves. They must register by providing details like first name, last name and email address.
- **Login class**- After successful registration user can open the website anytime using their login credentials which includes login username and password
- **Poster class**- It has the poster uploaded by the user and all the information and contents of the poster. It has preprocessing () class associated with it.
- **Preprocessing class**- The poster information and processed poster will be present here.
- **Font evaluation**- It evaluates the size and style of the font present in the poster.
- **Indentation evaluation**- It checks if the poster has all the text in proper spacing and indentation or not and displays the wrong indented results.
- **Reference link validation**- Identifies the links present in the poster and validates if this is a valid link or an invalid one.
- **Color comparison**- Compares the colors and identifies the RGB colors and the frequencies in the poster.
- **Duplicate sentences Identification**- Extracts text from the poster and detects duplicate sentences from the text.
- **Image logo differentiation**- Identifies all the pictures from the poster and detects if this is an image or poster and then differentiates it.

Class Diagrams:

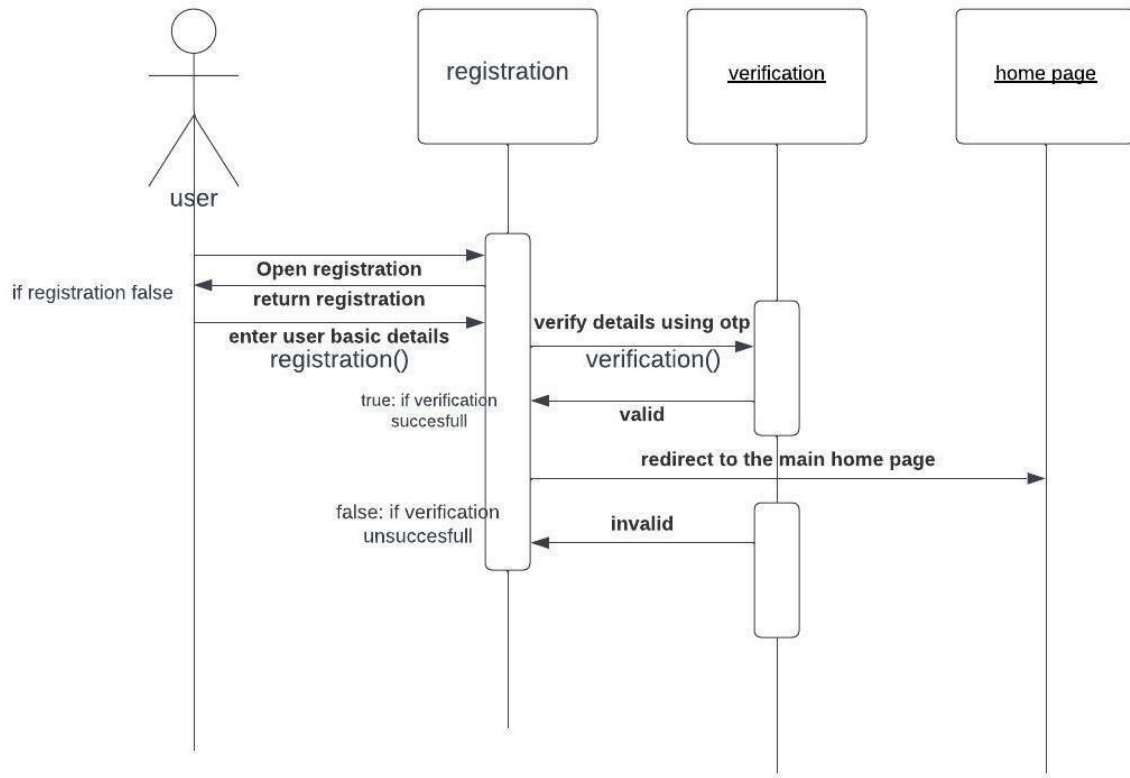


ER DIAGRAM:

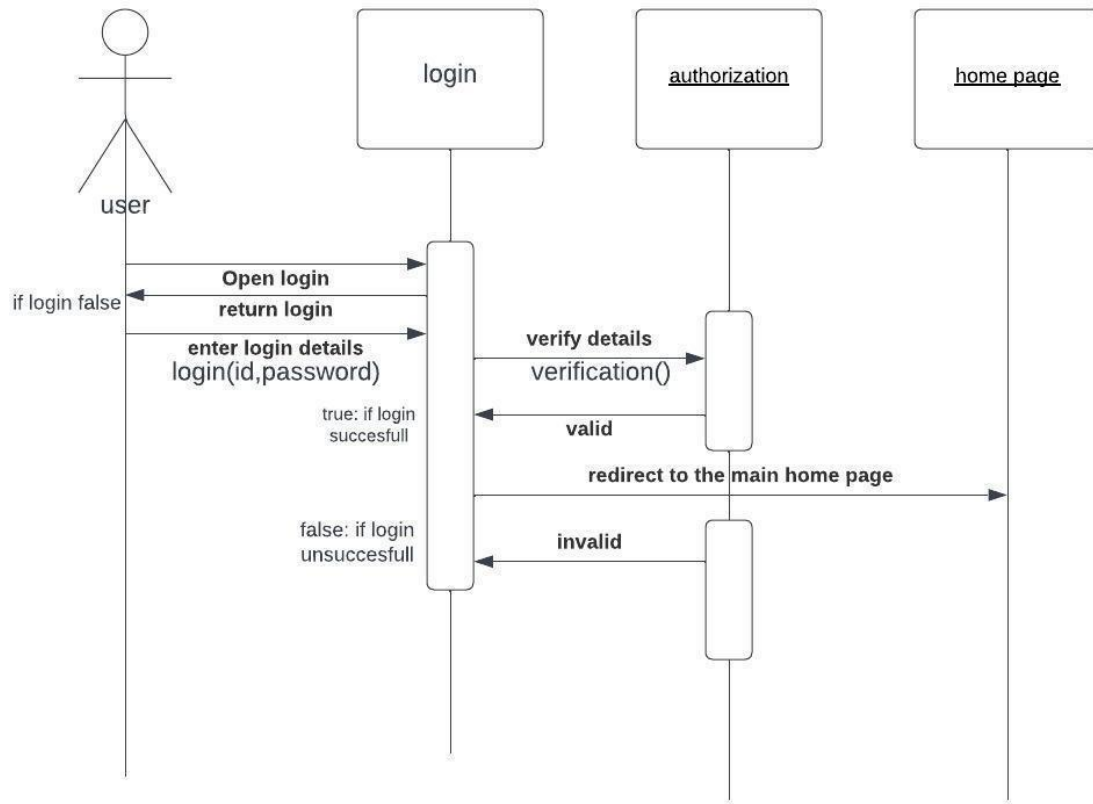


SEQUENCE DIAGRAM(S)

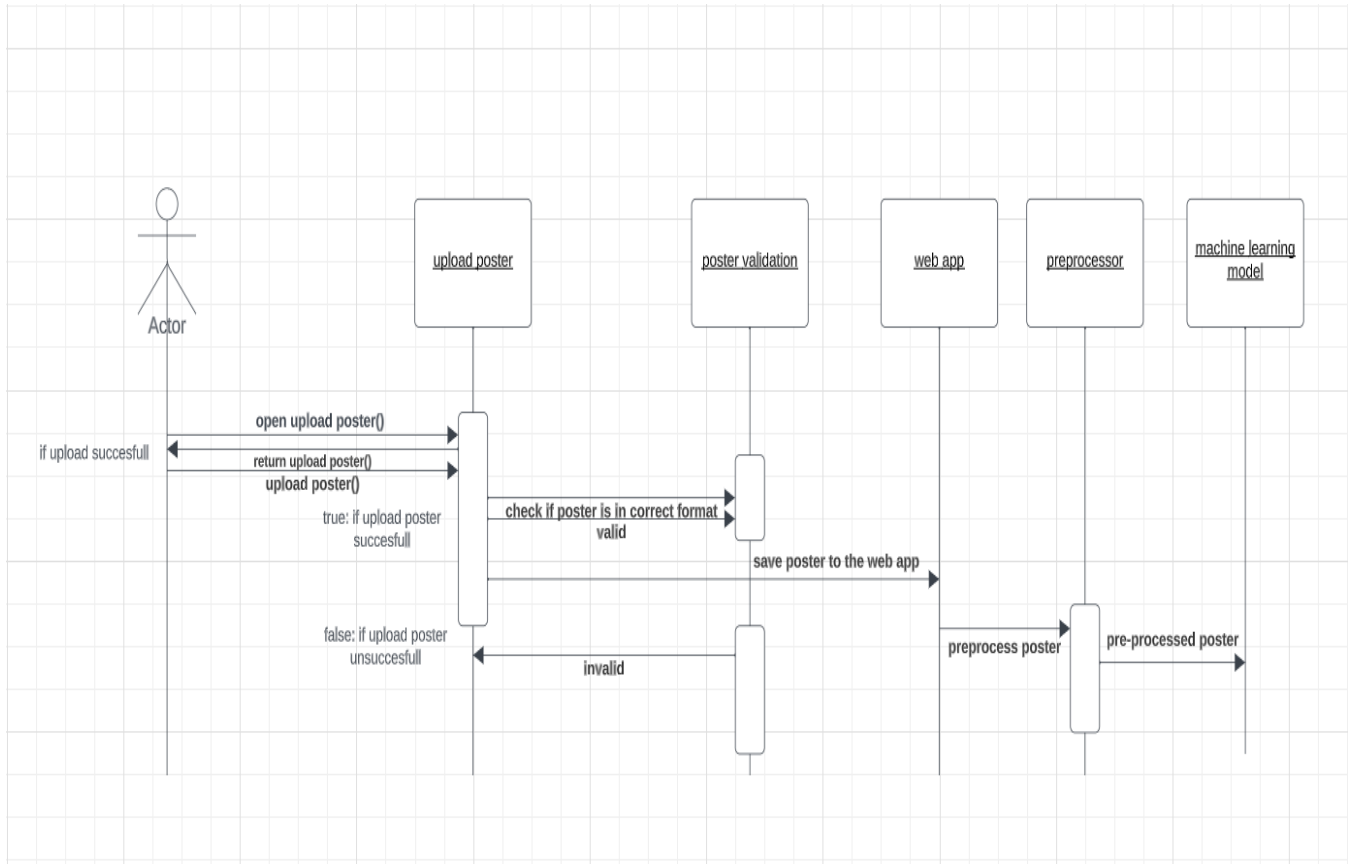
1. Registration:



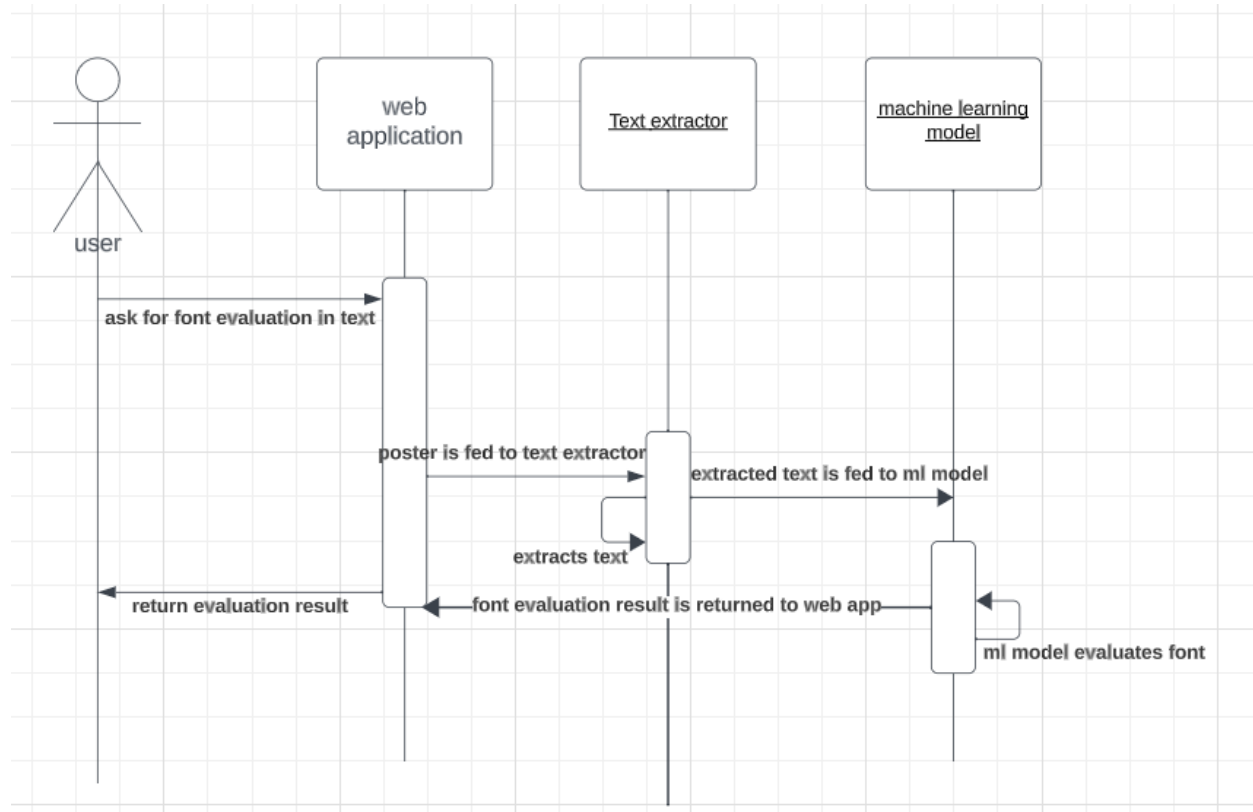
2.Login:



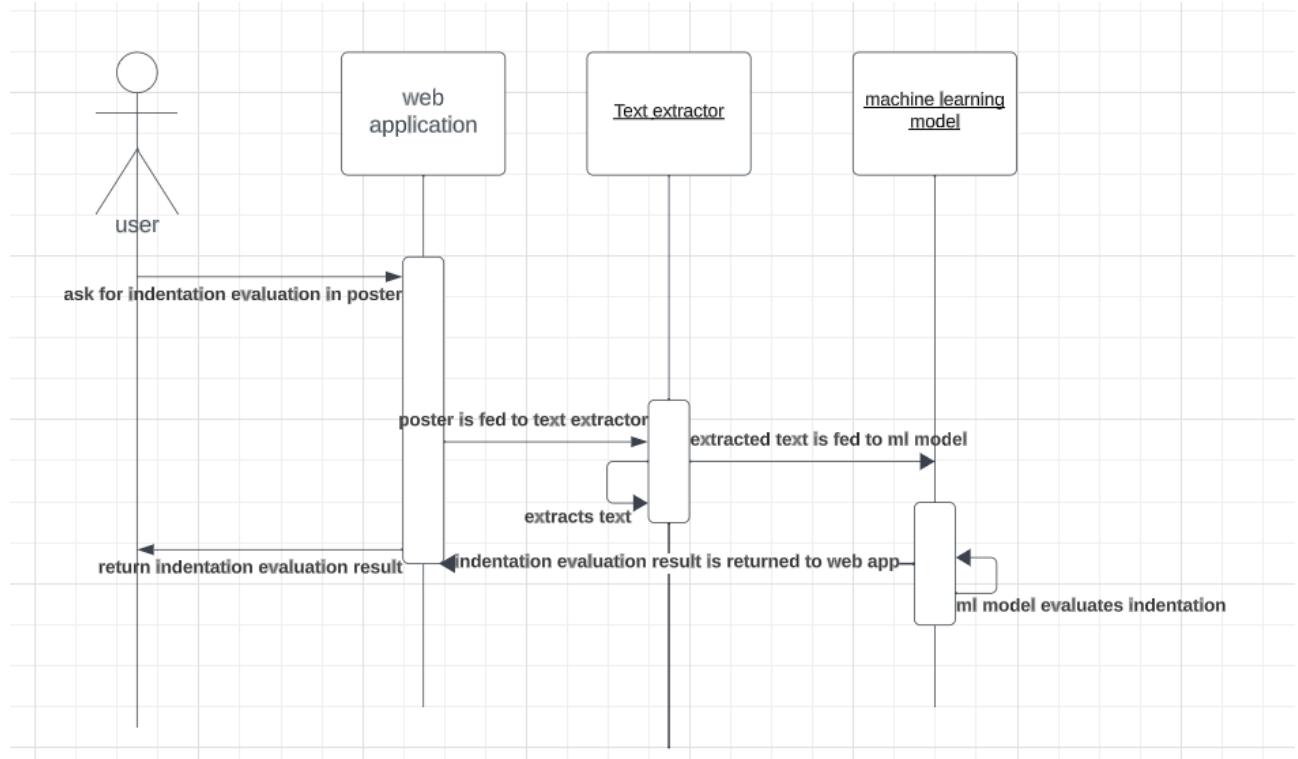
3. Data collection and preprocessing



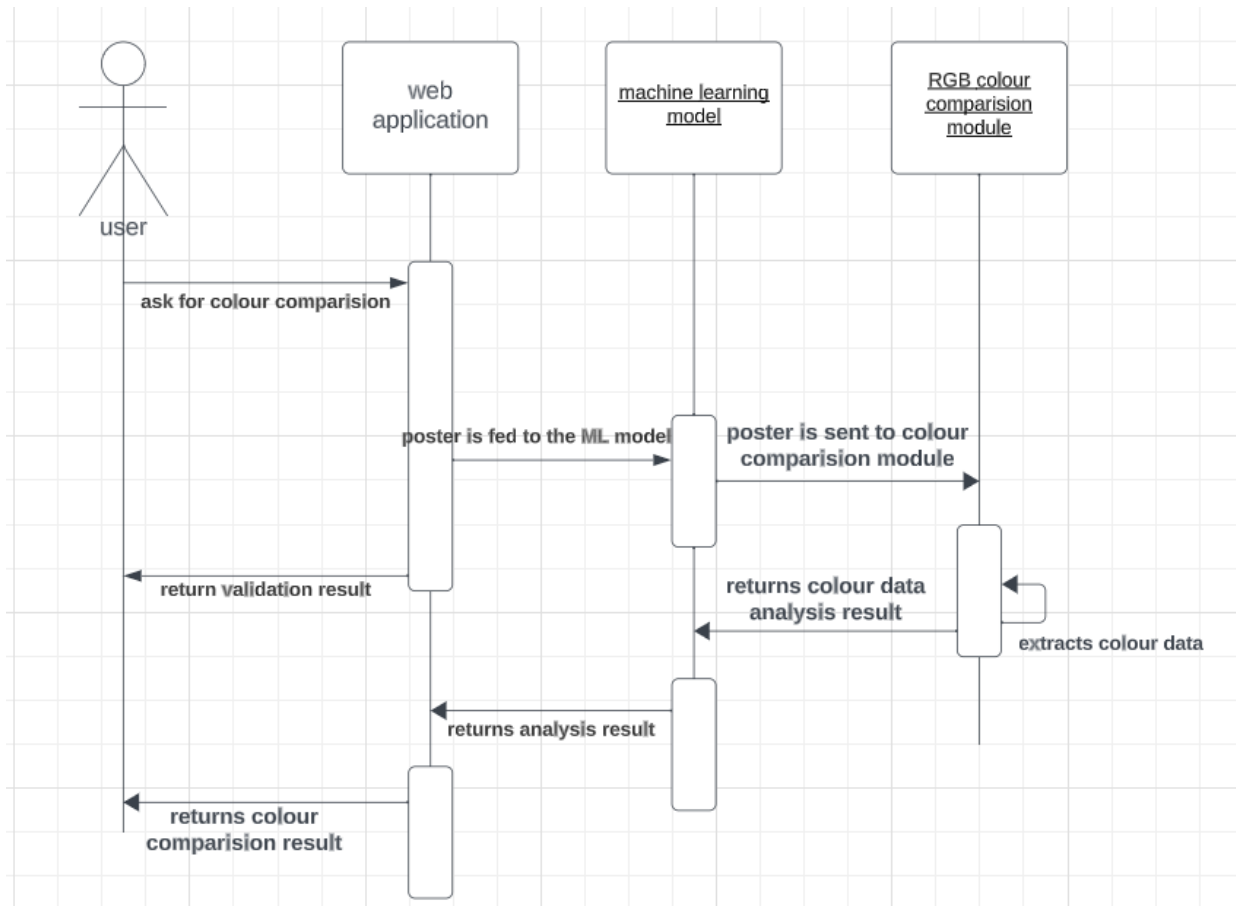
4. Font evaluation:



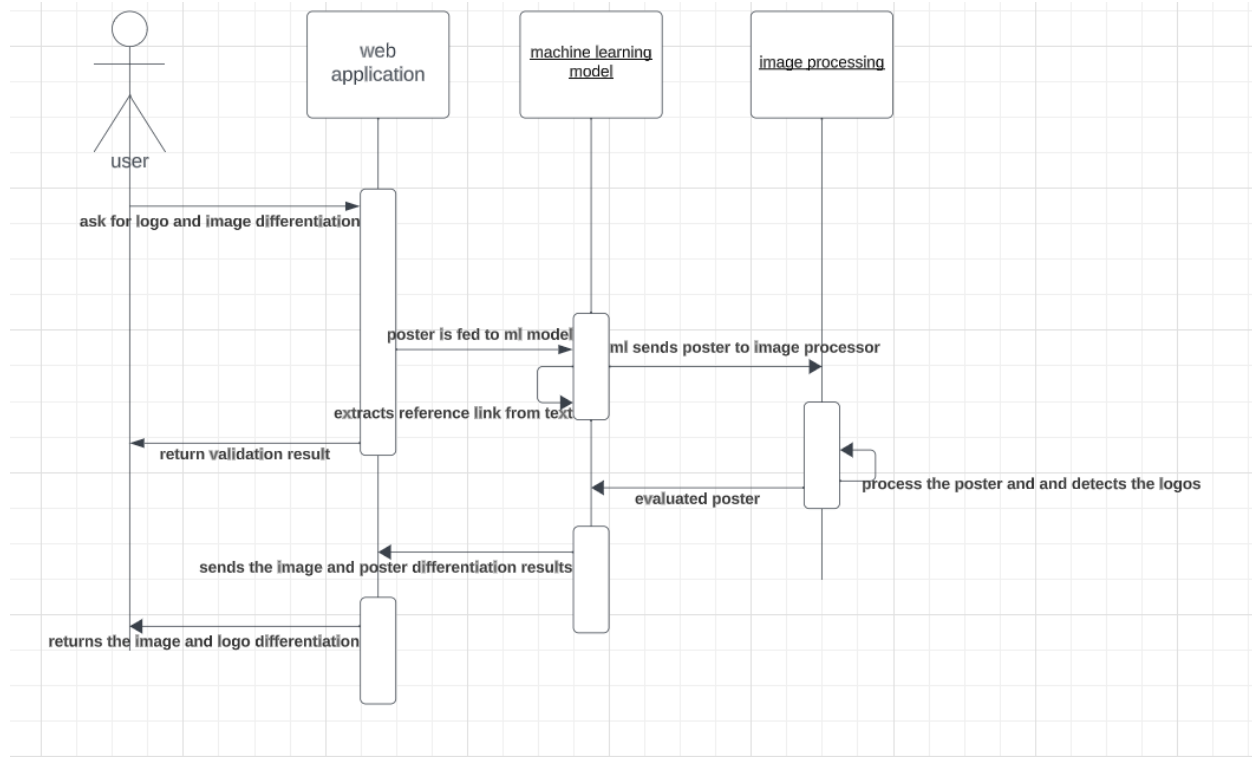
5. Indentation Evaluation:



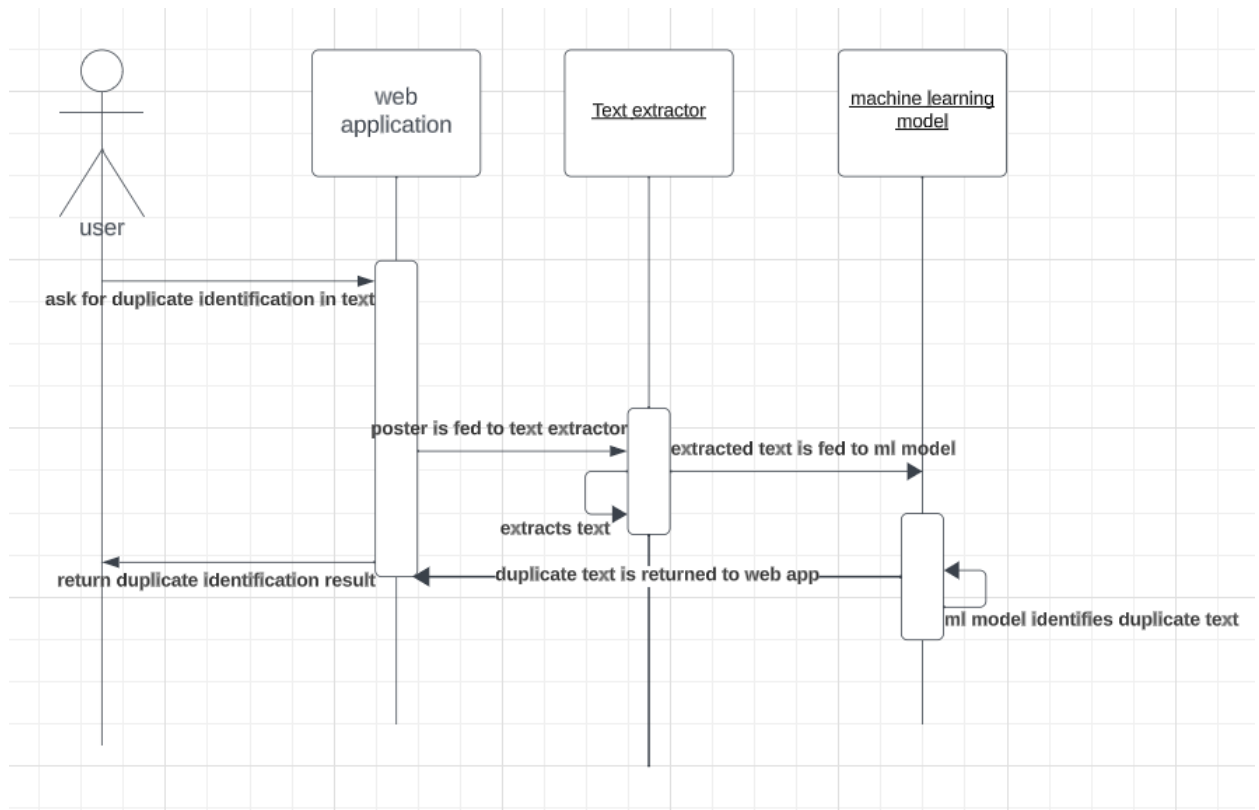
6. Color comparison:



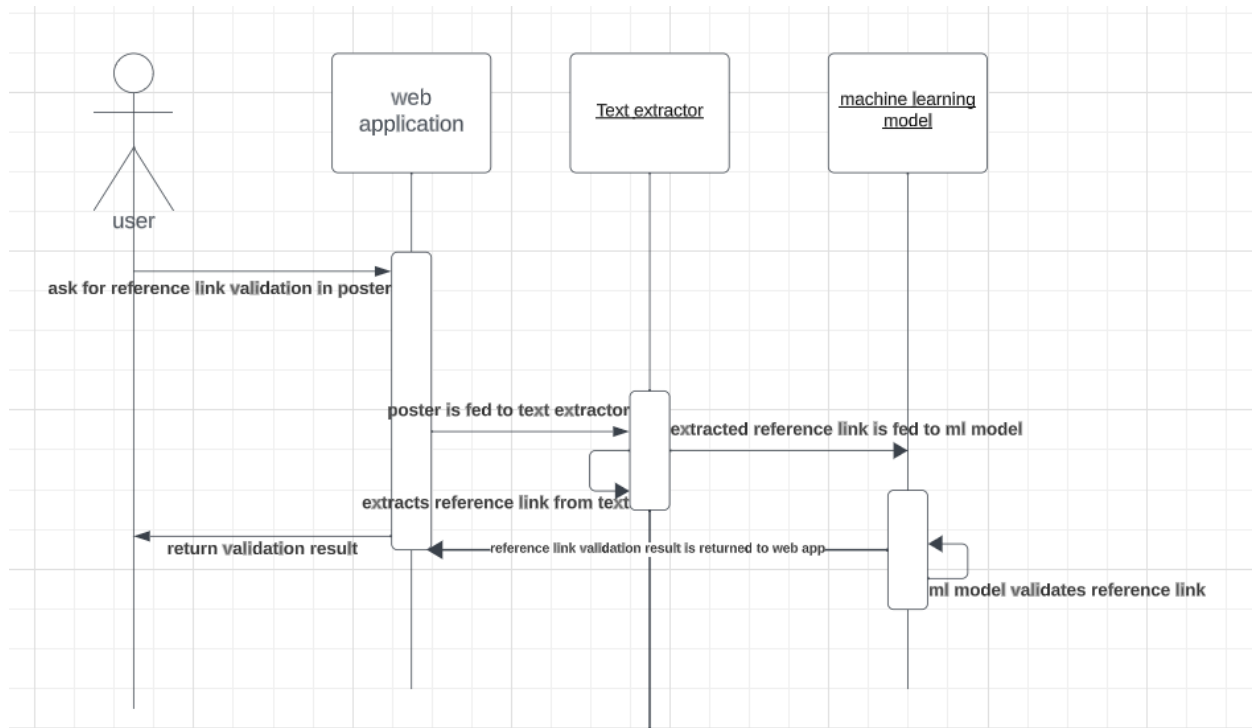
7. Image and logo differentiation:



8. Duplicate sentence identification:



9. Reference link validation:



Design Rationale

User Interface (UI):

Rationale:

We want our system to be super easy for users to use. It should feel user friendly, making it simple to evaluate posters and view results by the users

Registration and Login:

Rationale:

The registration page is the entrance to the system. It collects all the user information, such as first name, last name and email, to create the user account. It ensures that only registered and valid users can access and login to the system. Once registered, the login page allows users to login to their accounts quickly. It ensures user privacy and security using a very safe and protected login.

Data Collection and Preprocessing:

Rationale:

Data collection and preprocessing is useful for training, evaluation and implementation machine learning model

Font Size Evaluation:

Rationale:

Font size is very important in poster design. It extracts the text and evaluates the size and style of the font in the poster.

Color Comparison:

Rationale:

Posters have so many colors. So, this color comparison helps to evaluate RGB colors in the poster using pixels and identifies the frequency of each color.

Duplicate Sentences Identification:

Rationale:

Duplicate sentences act as noise in the text. So, we need to identify these duplicate sentences to make the text clearer and poster easy to understand.

Indentation Evaluation:

Rationale:

Proper indentation is needed for every poster so that it can be easily understandable. It ensures that if text is properly aligned and space is properly given or not.

Image/Logo Differentiation:

Rationale:

We will check the poster for pictures and identify logos and images from the pictures and differentiate between logos and images.

Reference Link Validation:

Rationale:

It will check for reference links in the poster and validates if the reference link is valid or not

Integration and Deployment:

Rationale:

Integration checks if all parts of the system work properly, and deployment makes the system accessible to users.

Testing and Maintenance:

Rationale:

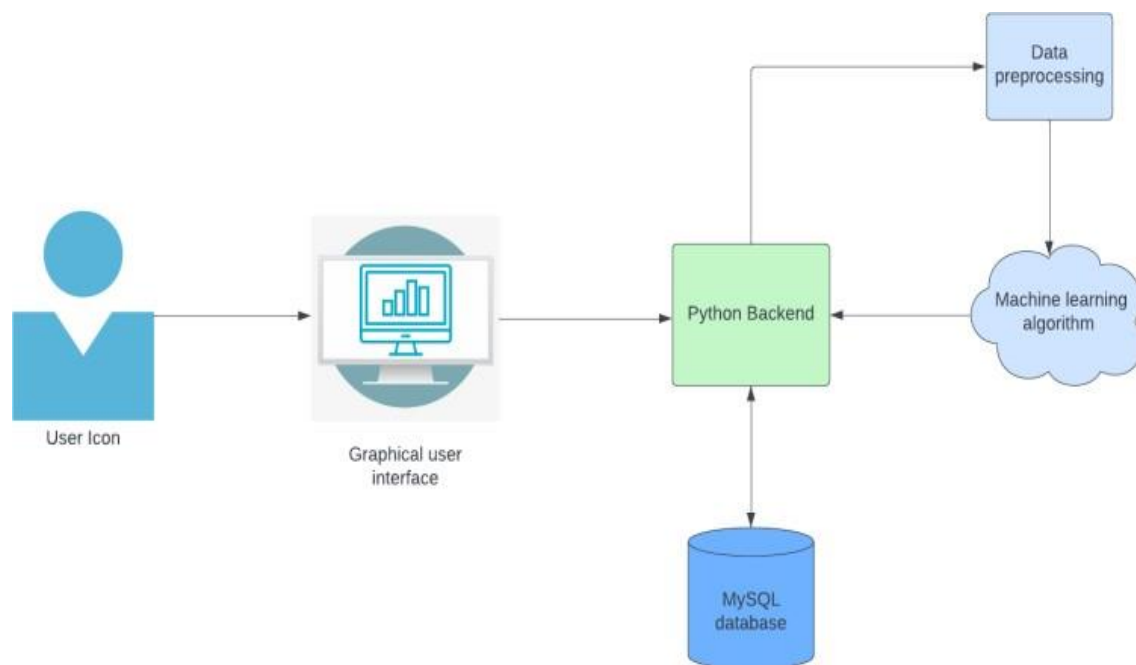
Testing and maintenance are used to check all the bugs and debug them so that the system is working properly before the user tries it.

Steps:

First the user gets a home page, and he needs to register. If he is a new user else, he can login directly. Registration requires the user to enter his first name, lastname,email id and all other details. Once registration is successful the poster evaluation web page opens, and the user

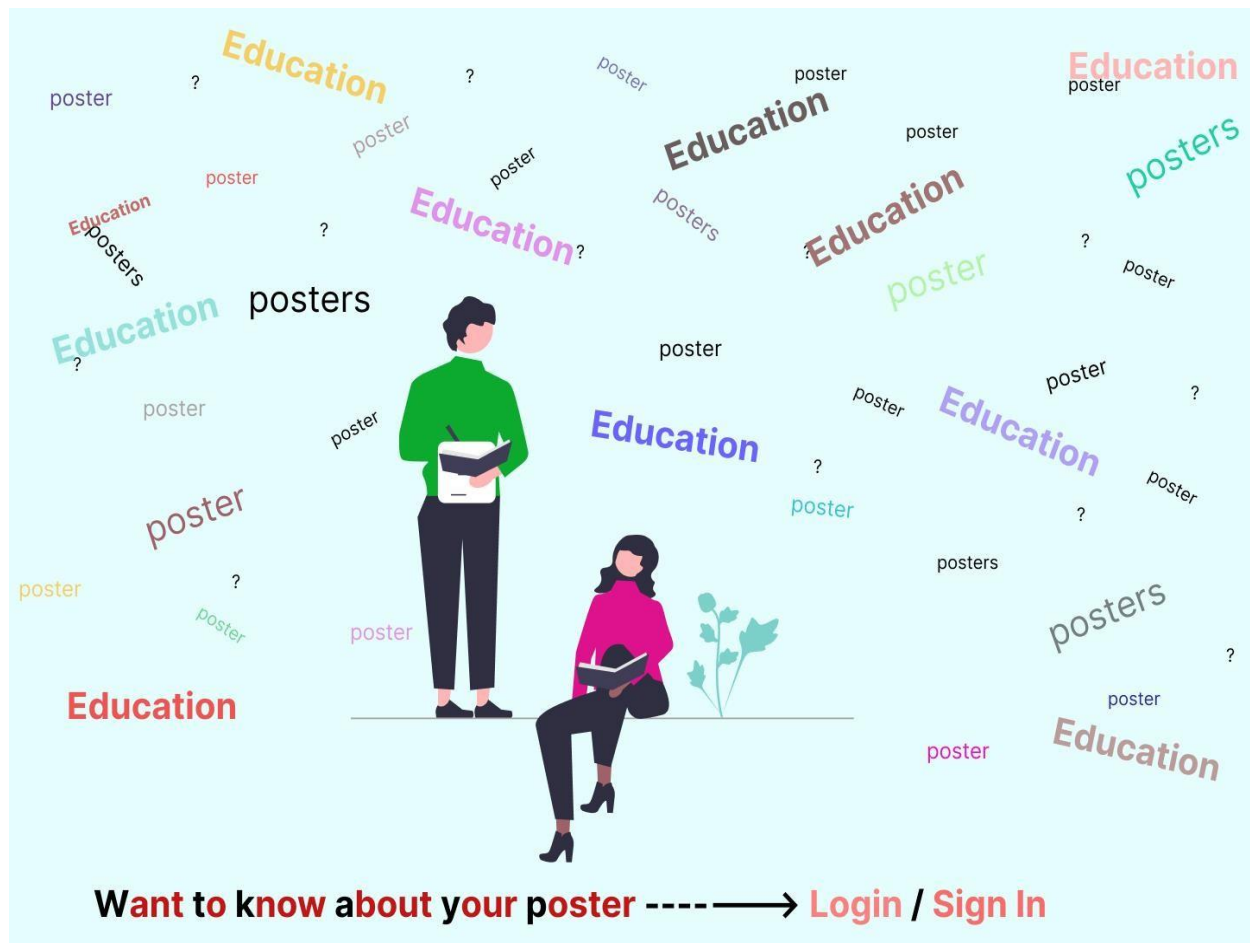
needs to upload the poster and preprocessing is done on the poster. Next the user needs to select the feature he wants. The features provided are font size evaluation, colour comparison, duplicate sentences identification, indentation evaluation, image or logo differentiation and reference link validation. Based on the user selection the machine learning model generates the output and the user interface displays the result to the user.

Information Architecture Diagram:

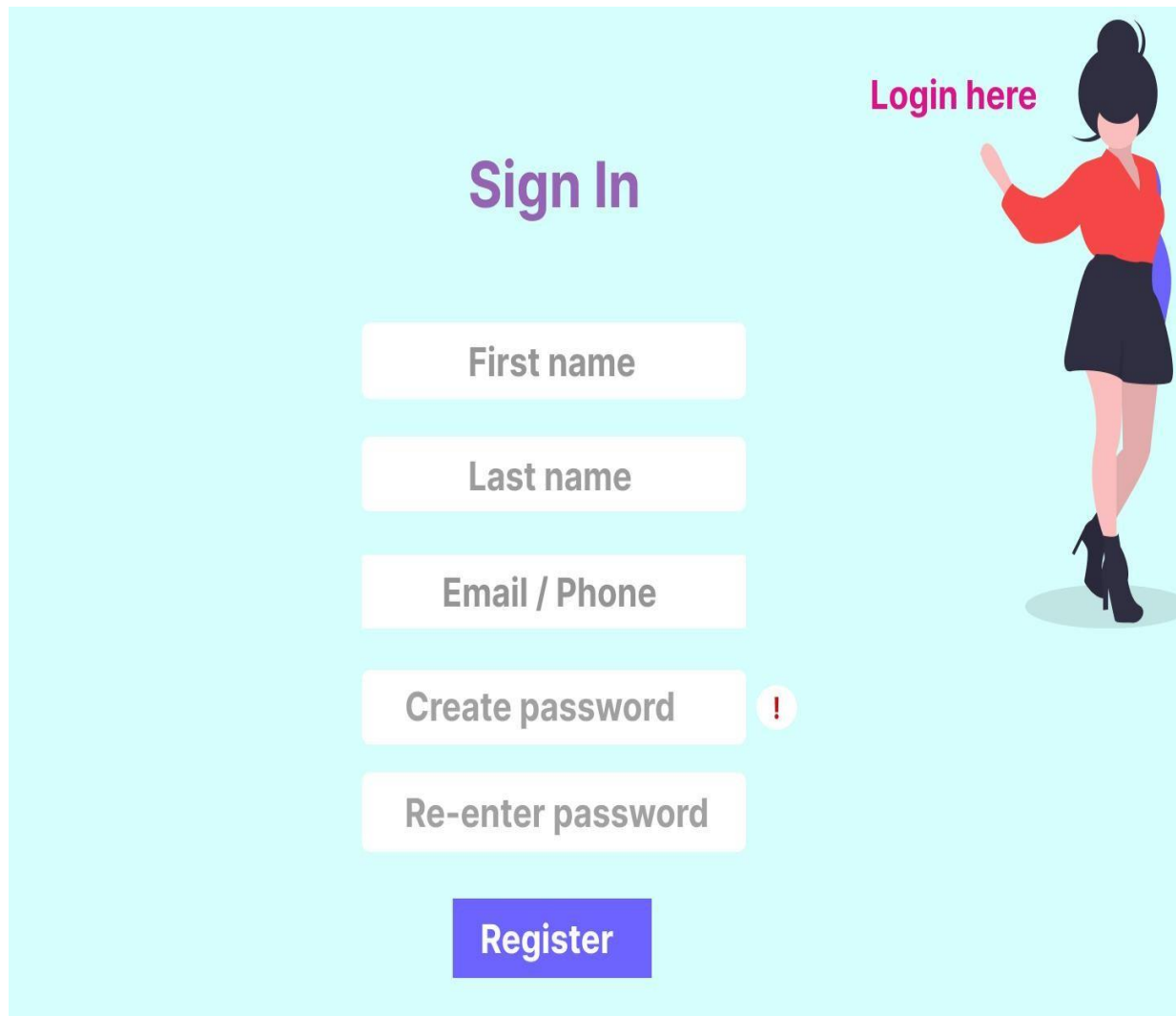


User Interface Wireframe(s)/Screenshot(s):

1. **Home page** : The user at first is redirected to the Home page. Users who are using this UI for first time are supposed to sign up and existing users can easily login



2. **Registration Page:** This page allows the user to register on the user interface for the first time



The registration form is set against a light blue background. On the right side, there is a stylized illustration of a woman with dark hair in a bun, wearing a red long-sleeved top, a black skirt, and black high-heeled shoes. She is pointing her right hand towards the 'Login here' text. The text 'Login here' is in a pink, sans-serif font. The main heading 'Sign In' is in a large, bold, purple font. Below it, there are five white input fields with rounded corners, each containing a label in a grey font: 'First name', 'Last name', 'Email / Phone', 'Create password', and 'Re-enter password'. A small red exclamation mark icon is positioned to the right of the 'Create password' field. At the bottom of the form is a solid blue button with the word 'Register' in white text.

Sign In

Login here

First name

Last name

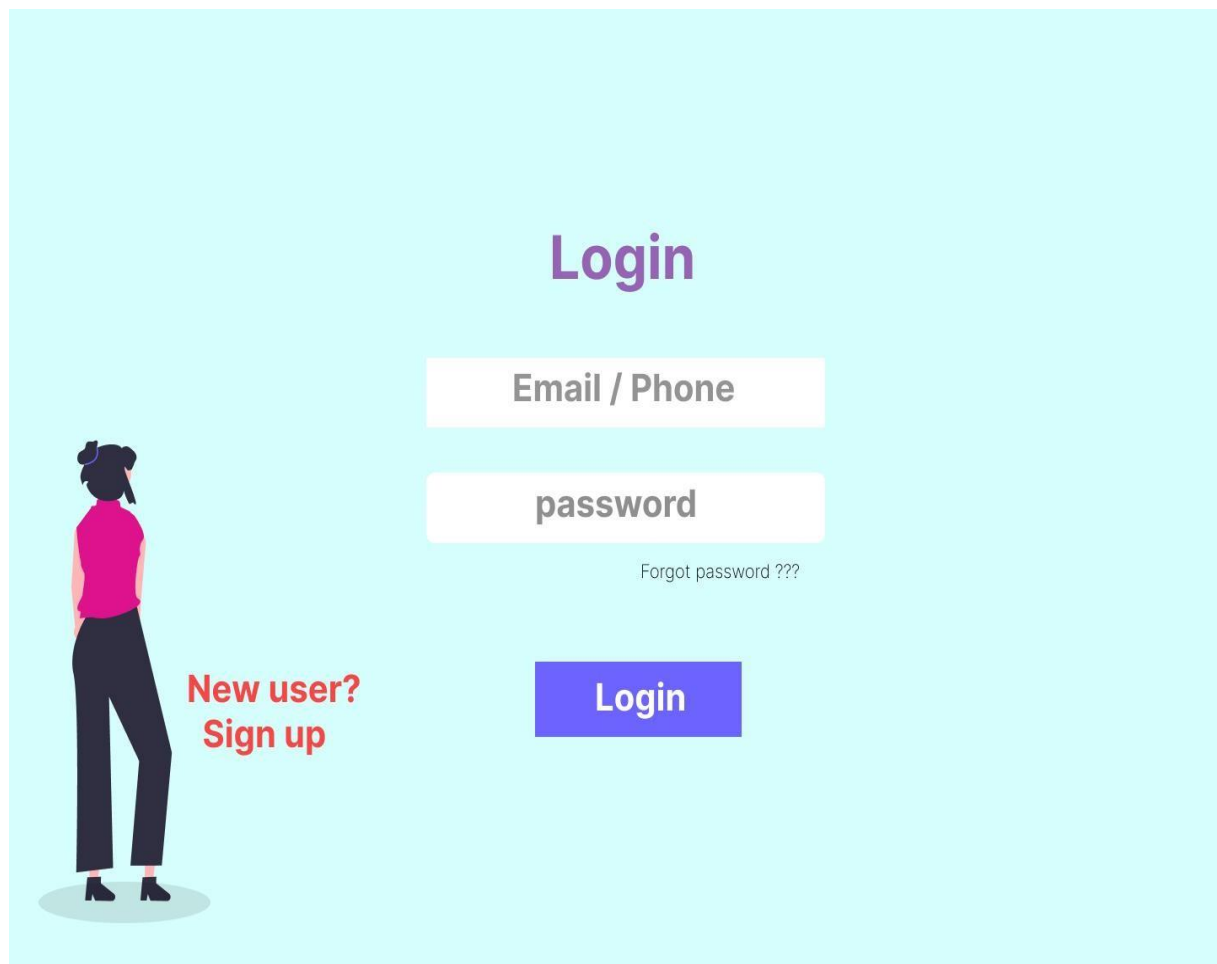
Email / Phone

Create password !

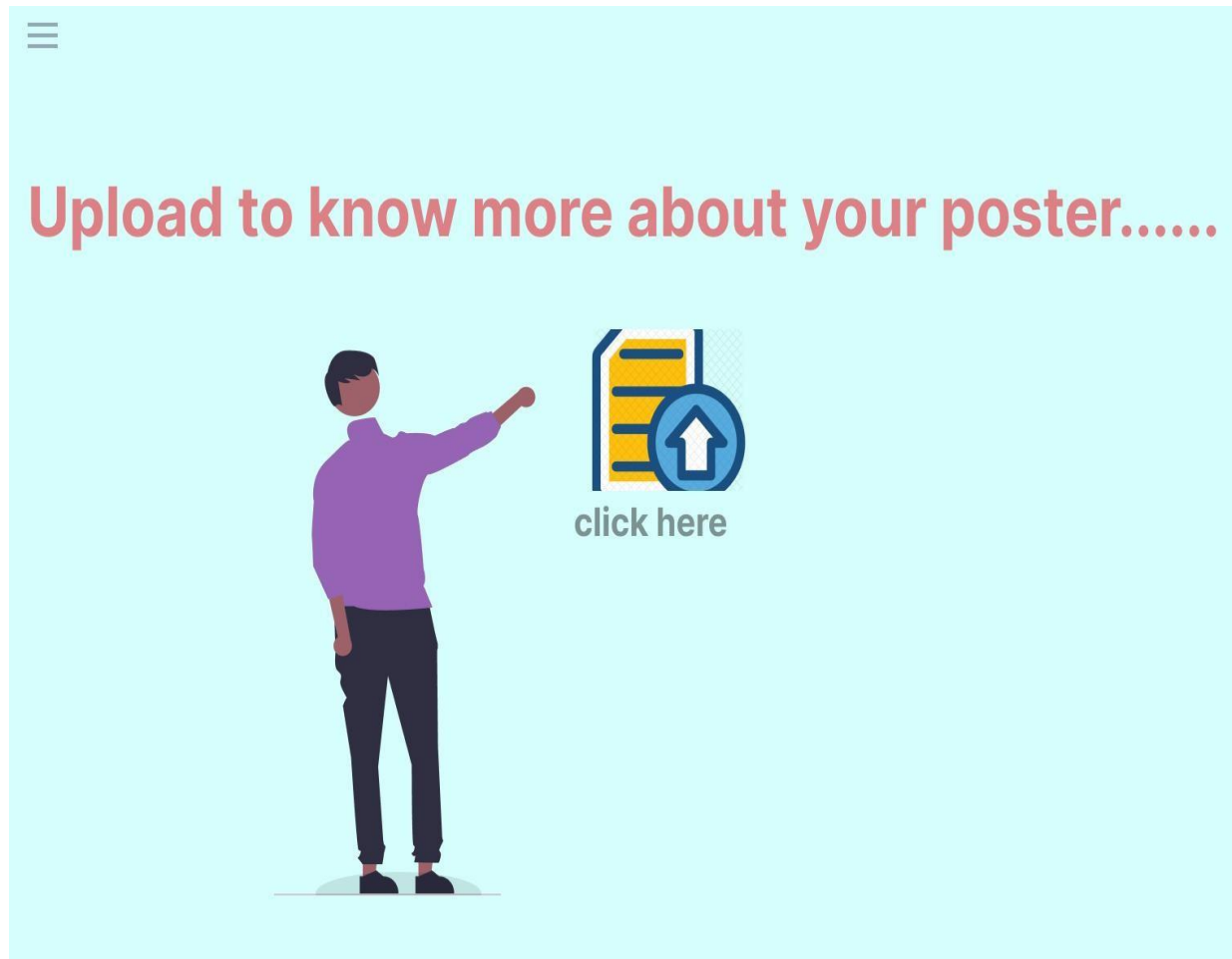
Re-enter password

Register

3. **Login Page** : This page allows the user to login



4. **Uploading the poster:** In the home page, the user needs to upload the poster for the evaluation



5. Selecting the evaluation: Here after uploading the poster, the user can select which type of evaluation they want for their uploaded poster.

Estimating Airport Emission Inventory and Impacts on Air Quality - A Case Study of the Lagos Airport in Nigeria

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Introduction

- Aviation is one of the fastest growing sources of greenhouse gas (GHG) emissions and other air pollutants, such as NO_x, PM_{2.5} and SO_x.
- According to the WHO, air pollution is a serious problem in Lagos and seven million people were killed worldwide by air pollution related diseases in 2012 alone

Data

- Activity records and ICAO emissions rates
- Emission species: Carbon monoxide (CO), Carbon dioxide (CO₂), Nitrogen oxides (NO_x), Particulate matter (PM₁₀) and Sulphur oxides (SO_x)

Expected Result

- The process of estimating the airport emission inventory

- For example, for the flight from Lagos to London Heathrow, the information and predictions are shown below

Flight Information	
Distance	5800 km
Average fuel consumption	8000 kg
CO ₂ emissions	30000 x 3.151 = 94530.0 kg
Aircraft type	777
Engine type	Boeing 777-300ER
Number of engines	3

Emission Inventory	
Equation-Option A	Equation-Option B
(Unit: kg)	(Unit: kg)
CO ₂	CO ₂
NO _x	NO _x
PM ₁₀	PM ₁₀
PM _{2.5}	PM _{2.5}
SO _x	SO _x

Methodology

- Use ICAO methods to estimate the airport emission inventory (ICAO, 2011)
- Equation-Option A
- Equation-Option B

where:

- E_{CO_2} = CO₂ emissions
- E_{NO_x} = NO_x emissions
- $E_{PM_{10}}$ = PM₁₀ emissions
- $E_{PM_{2.5}}$ = PM_{2.5} emissions
- E_{SO_x} = SO_x emissions
- E_{CH_4} = CH₄ emissions
- E_{N_2O} = N₂O emissions
- E_{HFC} = HFC emissions
- E_{PFC} = PFC emissions
- E_{SF_6} = SF₆ emissions

Objectives

- To estimate the aircraft emissions in the Lagos airport
- To compare the emission results with international standards
- To use these estimates as an indication of the local air quality impact associated with Lagos airport

References

(1) ICAO. 2016. ICAO Aircraft Engine Emissions Database. Version 2.2. Available from: <https://www.icao.int/aviation/environment/icao-aircraft-engine-emissions-database/>

(2) ICAO. 2011. Airport Emissions Management. Available from: <https://www.icao.int/aviation/environment/airport-emissions-management/>

(3) ICAO. 2011. Airport Emissions Management. Available from: <https://www.icao.int/aviation/environment/airport-emissions-management/>

(4) ICAO. 2011. Airport Emissions Management. Available from: <https://www.icao.int/aviation/environment/airport-emissions-management/>

(5) ICAO. 2011. Airport Emissions Management. Available from: <https://www.icao.int/aviation/environment/airport-emissions-management/>

(6) ICAO. 2011. Airport Emissions Management. Available from: <https://www.icao.int/aviation/environment/airport-emissions-management/>

(7) ICAO. 2011. Airport Emissions Management. Available from: <https://www.icao.int/aviation/environment/airport-emissions-management/>

(8) World Bank. 2015. A Plan for Action against Pollution in Nigeria. Available from: <http://www.worldbank.org/en/publication/2015/06/15/a-plan-for-action-against-pollution>

Supervisor: Dr. Karl Hopkins
2nd reader: Dr. Thijs Dekker

Select evaluation

Font evaluation

Indentation evaluation

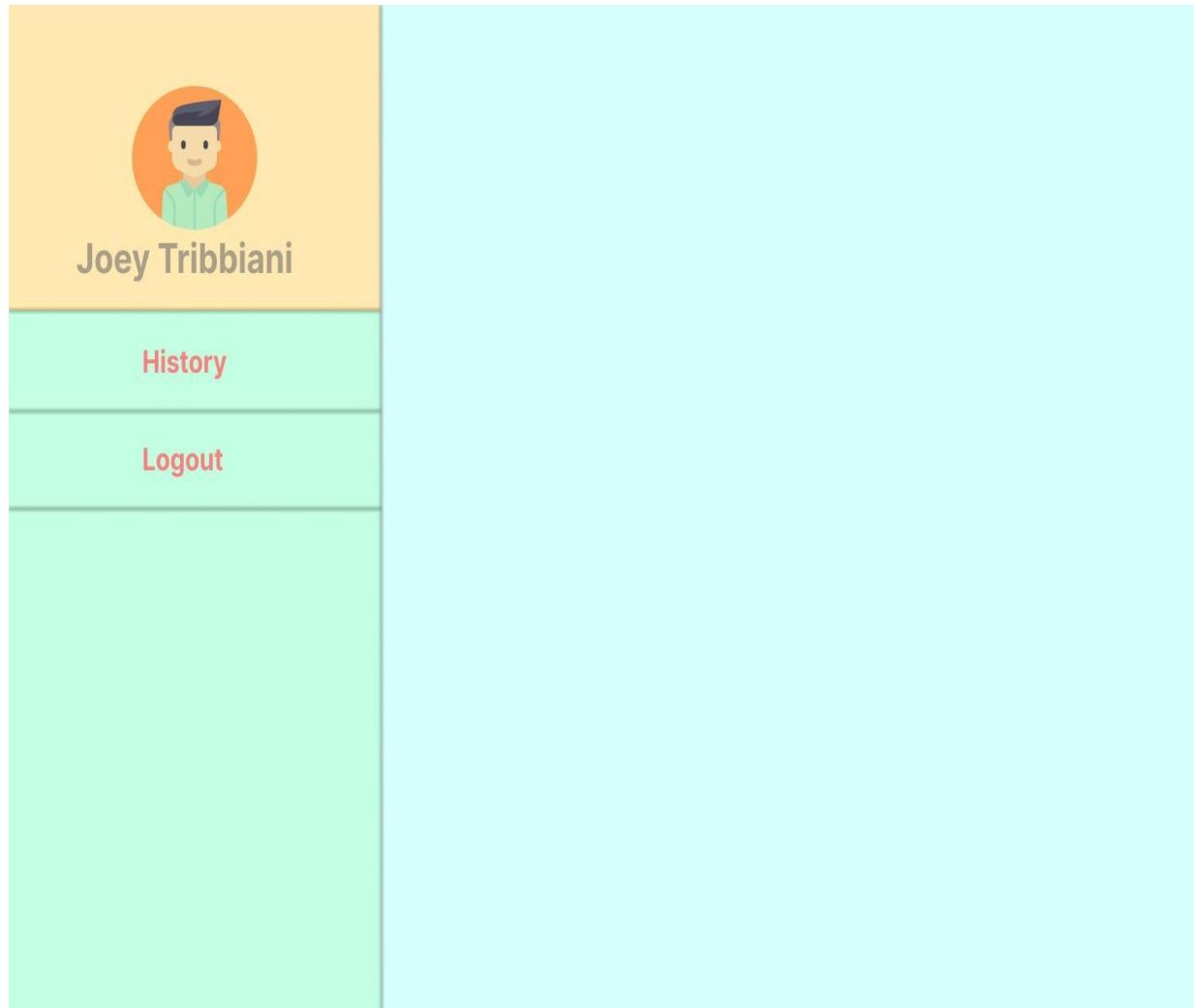
Colour comparison

Image and logo differentiation

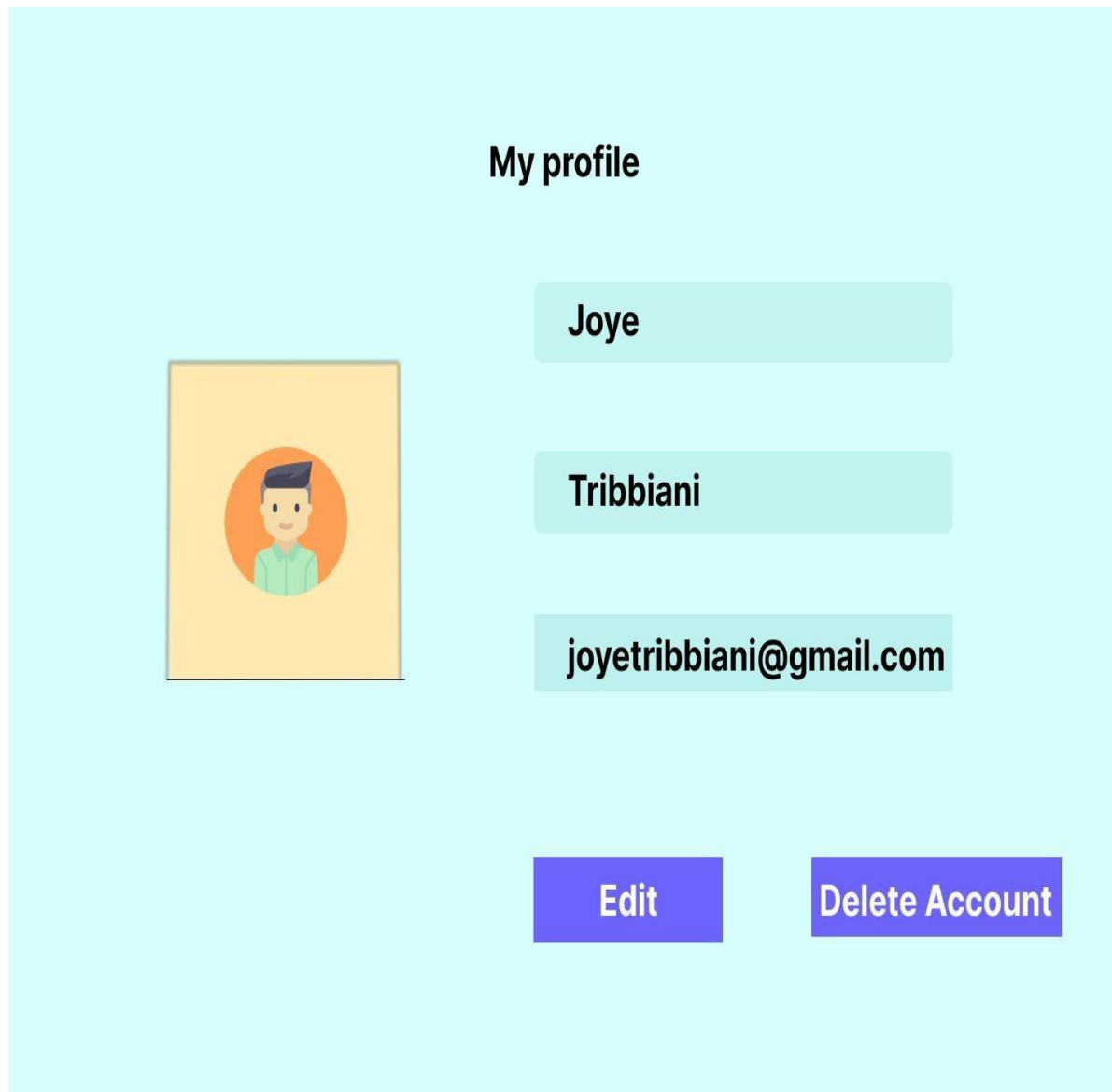
Duplicate sentence identification

Reference link validation

6.Navigation Bar In the user interface: we have designed a navigation bar where we can see the profile of the user, history which contains the activity of the user. There is also an option for the user to logout after the evaluation of poster.

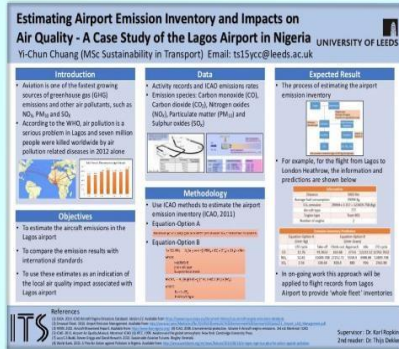


7.Profile Page :This is the profile of a sample user. They have created the profile using their email ID. The user has the option to edit or delete their account too

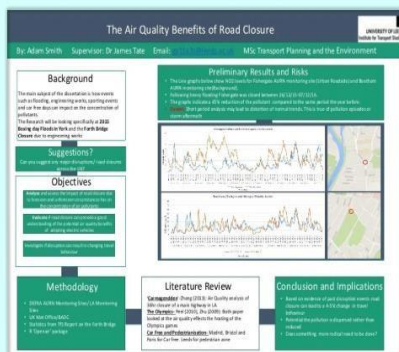


8. **History:** This tab will allow the users to see their activity.

History



Estimating airport emission inventory and impacts



The air quality benefits of Road closure....



Academic research poster of university of

INDIVIDUAL CONTRIBUTIONS

S.No.	Name	Student ID	Contributions
1	Jyothirmai,Vadaparthi	11699561	Class Diagram, ER diagram and Sequence Diagram, Design Rationale
2	Ashritha,Battula	11712061	Design Rationale
3	Siddareddy Tejaswi Reddy	11697669	Class Diagram, ER diagram and Sequence Diagram Design Rationale
4	Bhavana Bayyapu	11680072	Information Architecture diagram, Developing user Interface wireframe using figma
5	Jagruthi Pullaiahgari	11704227	Developing user Interface wireframe using figma

