
Design Document

for
College PathFinder

Version 1.0

Prepared by

Team 1

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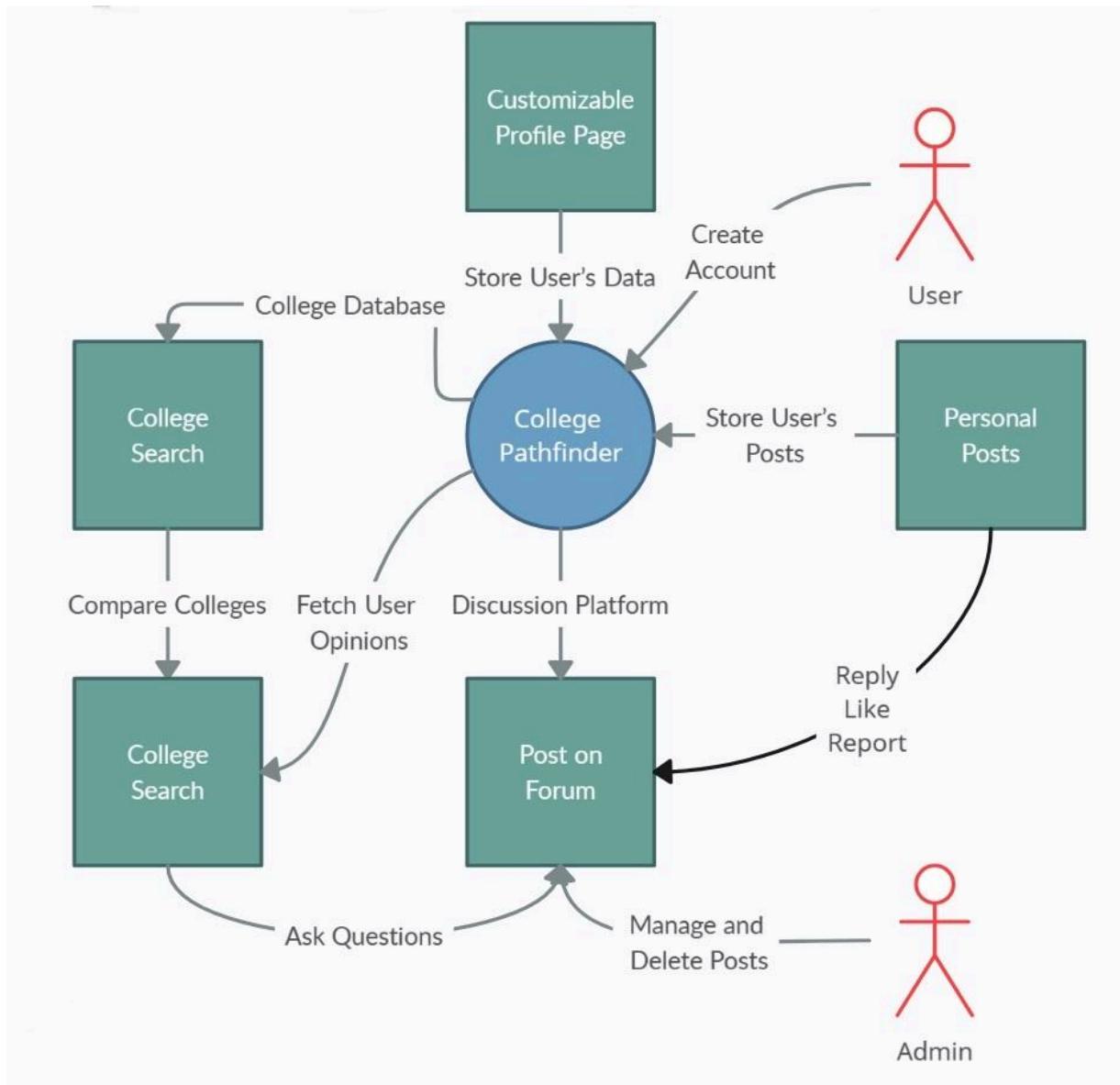
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Revisions

Version	Primary Author(s)	Description of Version	Date Completed
V 1.0	group 1 members	software design document	09/02/24

1 Context Design

1.1 Context Model



1.2 Human Interface Design

Registration Page

The screenshot displays two side-by-side forms on the College PathFinder website. The left form is for 'Login' and the right form is for 'Register'. Both forms share a common header and footer graphic featuring a modern building with people on its balconies.

Login Form Fields:

- Email ID
- Password
- Login** button
- Link: New User? [Register Here](#)

Register Form Fields:

- Name (min. 5 words)
- Username (min. 5 words)
- Email ID (min. 5 words)
- Password (min. 5 words)
- Confirm Password
- User Type dropdown menu (College Searching)

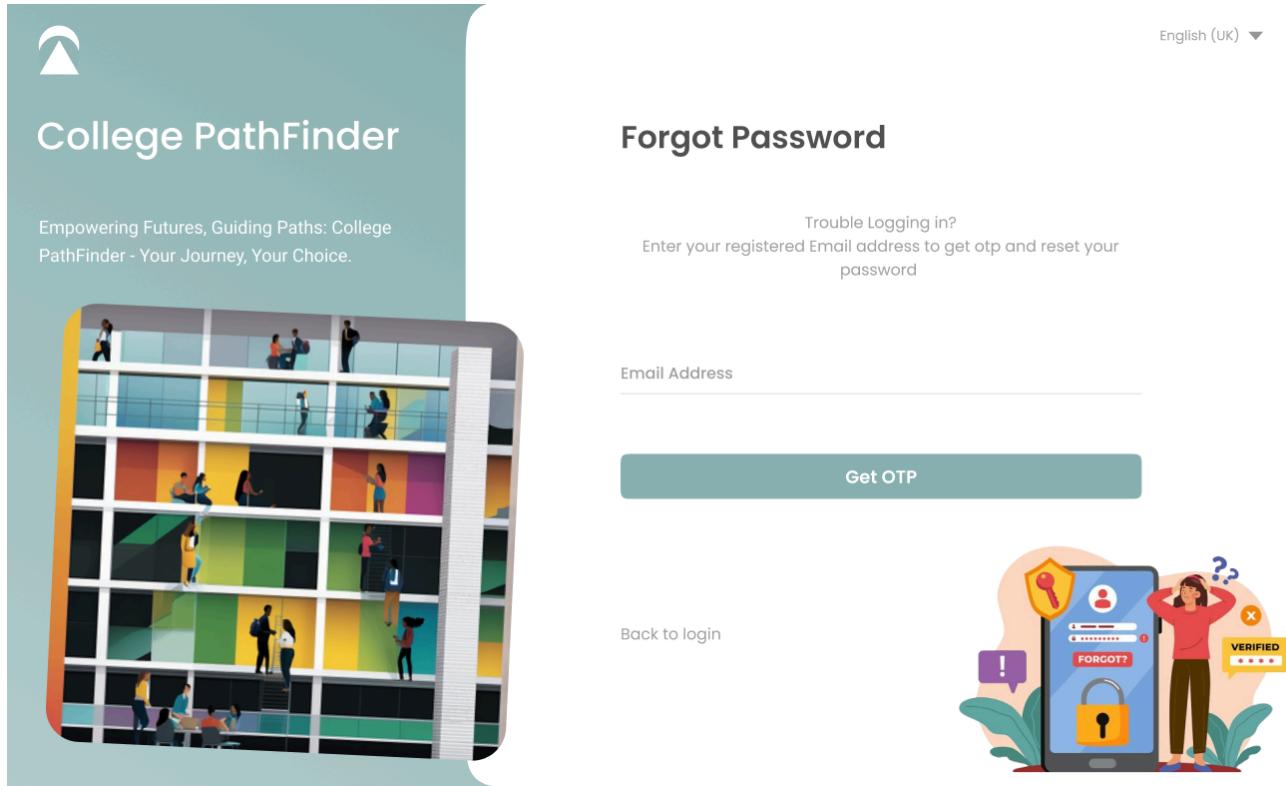
This page facilitates user registration and also includes options for user and admin Login.

Login Page

Users can log in to College PathFinder by entering their username, email address, and password. They can also log in through their Google or Facebook account.

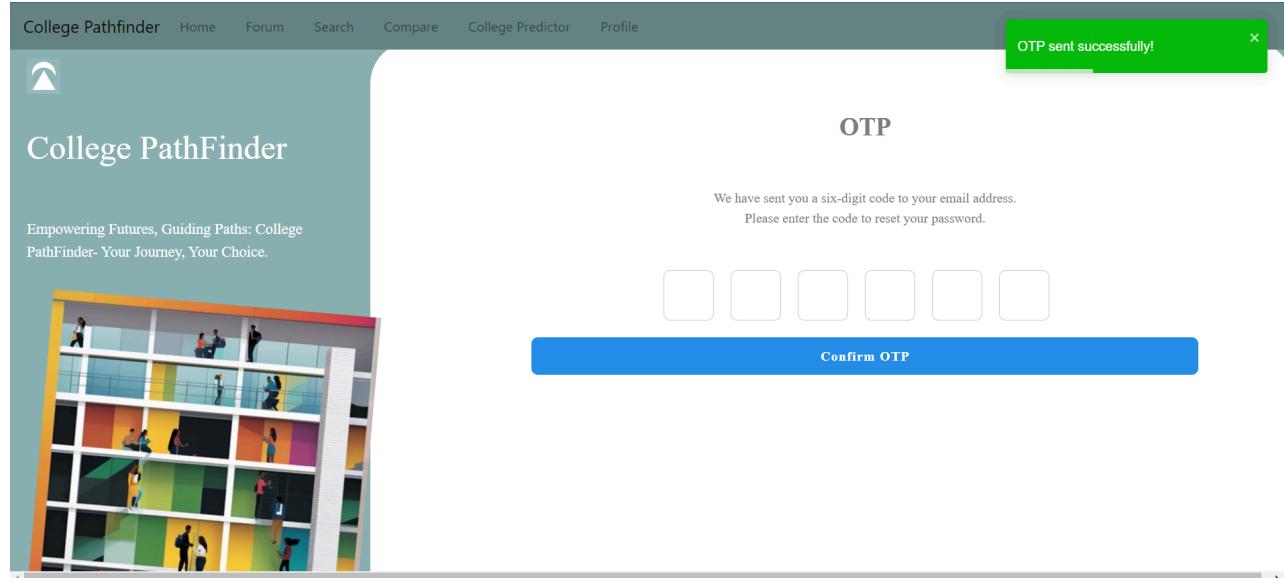
Forgot Password

This feature is made so that people who forgot their password can get it back



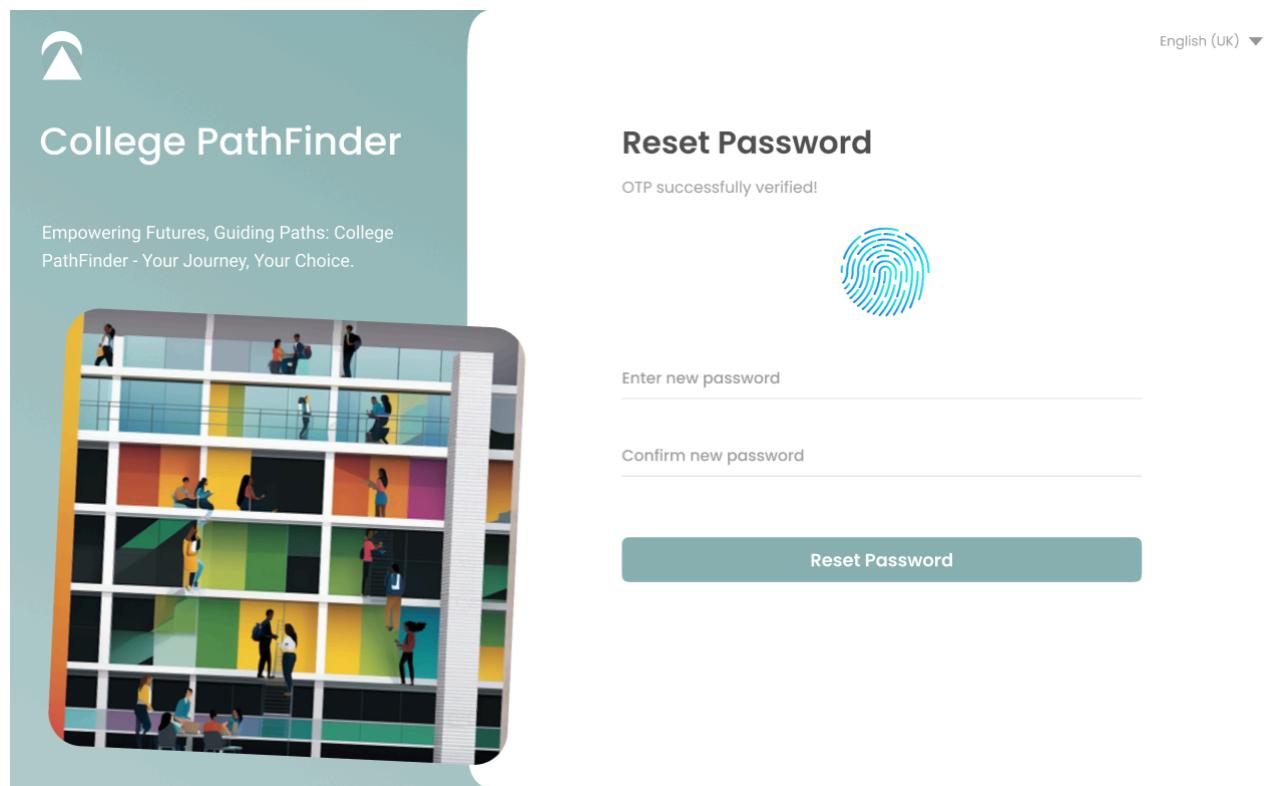
OTP Verification

After entering their email address, the user will receive an OTP to verify their identity.



Reset Password

This is made in continuation of the forgot password regeneration process



Home Page

This is how we shall expect our course website home page to look.



College Seeking Student's Profile

The user can edit their professional details, view their bookmarks, tell about themselves etc.

This image shows a user profile page. At the top, there is a navigation bar with links for 'College Pathfinder', 'Home', 'Forum', 'Search', 'Compare', 'College Predictor', 'Profile', 'Hi srishask04', and 'Logout'. The profile picture of the user 'srishask04' is shown, with a yellow 'Verified' badge next to it. The profile is divided into sections: 'Personal Details' and 'Tell us about Yourself'. The 'Personal Details' section contains fields for 'Your Name' (Srisha), 'Username' (srishask04), and 'Email' (srishas22@iitk.ac.in), each with an 'Edit' button. The 'Tell us about Yourself' section has a large text area and an 'Edit' button. The background of the profile page features a green gradient.

College Graduated Person's Profile

The user can edit their professional details, edit their info, upload their documents, etc.

The screenshot displays a user profile page from the "College Pathfinder" application. At the top, there is a navigation bar with links for Home, Forum, Search, Compare, College Predictor, and Profile. On the right side of the header, there are "Hi Astitva" and "Logout" buttons. The main content area is divided into several sections:

- Personal Details:** This section contains fields for "Your Name" (Astitva), "Username" (Astitva), "Email" (astitva6581@gmail.com), "College" (IIT Delhi), and "Branch" (ME). Each field has an "Edit" button to its right.
- Opinions:** This section includes four opinion categories: "Academic Opinion" (good), "Non Academic Opinion" (nicee), "Placement Opinion" (good), and "Overall Opinion" (good). Each category has an "Edit" button to its right.
- Your Posts:** This section displays a message stating "No posts to show".

Admin profile

The screenshot shows the Admin profile page. At the top, there is a navigation bar with links: College Pathfinder, Home, Forum, Search, Compare, College Predictor, Profile, Hi admin123, and Logout. Below the navigation bar, there is a profile picture with a verified badge. The profile section contains fields for Your Name (Admin), Username (admin123), and Email (admin@gmail.com), each with an 'Edit' button. To the right is a donut chart titled 'User Distribution' showing the following percentages: College Searching (63.4%), College Going (35.5%), and Admins (1.1%). The final section is 'Your Posts' with the message 'No posts to show'.

Admin Controls on Forum:

Admin can delete posts and replies on post.

The screenshot shows a forum post titled 'Related to IIT Kanpur EE'. The post content is: 'Hi I am from IIT Kanpur EE branch. I am here to help. If you have any questions I am happy to help.' Below the post are 'Like 0', 'Report 0', and '7 Views' buttons. It was posted by 'ayushmeena22' 4 days ago. A red 'Delete Post & Replies' button is visible. At the bottom, there is a text input field labeled 'Post Reply (min. 5 words)'.

College Predictor

College Seeking Students can get a list of available programs based on their rank and preferences

The screenshot shows the 'College Predictor' section of a website. At the top, there is a navigation bar with links: College Pathfinder, Home, Forum, Search, Compare, College Predictor (which is the active page), and Profile. On the right side of the navigation bar are 'Login' and 'Register' buttons. Below the navigation bar, the title 'College Predictor' is displayed. The main form contains four dropdown menus: 'JEE Advanced' (set to OPEN), 'Seat Type' (set to OPEN), 'Gender' (set to Gender-Neutral), and 'Category Closing Rank' (set to 1281). A 'Choose Preferred Branch:' dropdown is also present. A 'Submit' button is located below the dropdowns. Below the form, a large rounded rectangle contains the heading 'Available Options'. Inside this box, three program options for IIT Delhi are listed:

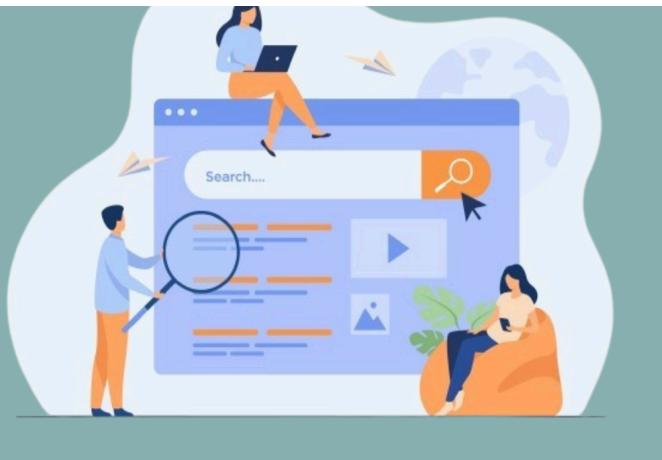
- IIT Delhi
Seat Type: OPEN
Gender : Gender-Neutral
Category Closing Rank : 1743
Mechanical Engineering (4 Years, Bachelor of Technology)
- IIT Delhi
Seat Type: OPEN
Gender : Gender-Neutral
Category Closing Rank : 4200
Materials Engineering (4 Years, Bachelor of Technology)
- IIT Delhi
Seat Type: OPEN
Gender : Gender-Neutral
Category Closing Rank : 4625
Biotechnology and Biochemical Engineering (4 Years, Bachelor of Technology)

At the bottom of the 'Available Options' box, a message states: 'There are 10 Possible options based on your search'.

Search Programs

Any type of user can search for a program by choosing a college and a branch and also view its information page.

College Search



Select College

- IIT Bombay
- IIT Delhi
- IIT Madras**
- IIT Kanpur
- IIT Kharagpur
- IIT Roorkee
- IIT Guwahati
- IIT Hyderabad
- IIT Varanasi
- IIT Indore
- IIT Gandhinagar
- IIT Patna
- IIT Bhubaneswar
- IIT Ropar
- IIT Mandi
- IIT Kanpur

CSE

Search

IIT Kanpur

CSE

Search

Student Opinions

John Doe

Email: johndoe@gmail.com

College: IIT Kanpur

Branch: CSE

Opinions:

- Academic Opinion: very good
- Non-Academic Opinion: very good
- Placement Opinion: very good
- Overall Opinion: very good

Ayush M

College Information and Reviews

Any type of user can view the program information, such as the college location and its reviews. The College Seeking Students can upvote/downvote, or report a review. The College Graduated Persons can write reviews and rate the program on various criteria.

The screenshot shows a web application interface for a college program. At the top, there is a navigation bar with links: Home, Forum, Search, Compare, College Predictor, Profile, Settings, and a search bar. The main content area displays information for "IIT Kanpur" under "Computer Science and Engineering".

College Overview:

- Institute Name: Indian Institute of Technology, Kanpur
- Location: Kanpur, Uttar Pradesh
- How to reach:
 - Kanpur Central Railway Station: 14 km
 - Kanpur Airport: 25 km
- Website: <https://www.iitk.ac.in/>
- Fee Structure:

Program Details:

- Mode of Admission: Through JEE Advanced
- Cutoffs: Select Category (dropdown menu showing General, SC, ST, OBC, EWS)
- Placement Statistics: Median package 35.35 k
- College Pathfinder Rating: 8.9/10
- Rankings: NIRF rankings 2023, QS rankings 2023, Website: <https://www.cse.iitk.ac.in/>

Reviews:

A dropdown menu titled "Select Criteria" is open, showing categories: Academics, Accommodation, Faculty, Infrastructure, Placements, and Social Life. The "Accommodation" category is currently selected.

Under "Accommodation", there are two reviews listed:

- Sid:** Rating 8.6/10. Review text: "orem ipsum dolor sit amet consetetur. Erat auctor a aliquam vel congue luctus. Leo diam cras neque mauris ac arcu elit ipsum dolor sit amet consetetur." Upvote, downvote, and Report buttons are present.
- Stat:** Rating 7.5/10. Review text: "Lorem ipsum dolor sit amet consetetur. Erat auctor a aliquam vel congue luctus. Leo diam cras neque mauris ac arcu elit ipsum dolor sit amet consetetur." Upvote, downvote, and Report buttons are present.

Compare Programs

Any type of user can compare two programs on criteria like rankings, placements, ratings, cutoffs, etc.

	IIT Kanpur	IIT Delhi
Location	Kanpur	New Delhi
Description	<p>Establishment: IIT Kanpur is a premier institution of technology established in 1959 by the Government of India. Renowned for its rigorous academics and cutting-edge research, IIT Kanpur is a leading force in shaping India's technological landscape.</p> <p>Alumni Network: The alumni actively engage with the institute through various initiatives, mentorship programs, and networking events. IIT Kanpur has produced a long list of distinguished alumni who have made significant contributions in various fields. Here are a few of the most famous ones:</p>	<p>Establishment: The Indian Institute of Technology Delhi (IIT Delhi) was established in 1961. It is one of the premier engineering institutions in India, located in Hauz Khas, New Delhi. IIT Delhi was established as part of the Institutes of Technology Act, 1961, which also established other IITs across the country.</p> <p>Alumni Network: The alumni actively engage with the institute through various initiatives, mentorship programs, and networking events. IIT Delhi has produced a long list of distinguished alumni who have made significant contributions in various fields. Here are a few of the most famous ones:</p> <p>i) Sachin Bansal (Co-founder of Flipkart): Sachin Bansal, a 2005 B.Tech graduate in Computer Science Engineering from IIT Delhi, is one of India's leading entrepreneurs. He co-founded Flipkart, one of the biggest e-commerce companies in India, which revolutionized online shopping in the country.</p>

News

Any type of user can view notifications and the latest news regarding upcoming exams and college admission events

Latest News

JEE Main 2024 Session 2 Registration Closes Today At 10:30 PM; List Of Top 50 Engineering Colleges Here

JEE Main 2024 Session 2 registration window will close today, March 4 at 10:30 PM. The candidates are allowed to make the corrections, latest by 7 March 2024 (up to 11:50 PM.)

JEE Main 2024 Results: 23 students scored 100 NTA score in session 1

The first exam session was conducted between January 24 and February 1. The second is scheduled between April 4 and April 15.

IIT Delhi Abu Dhabi admission for India students likely through JEE: Director

IIT Delhi Abu Dhabi campus is set to open in 2024. In an interview, director Ranjan Banerjee said the IIT Board is yet to approve the proposal.

TOP COLLEGES





Forums

College Seeking Students can ask questions, search for a topic, view Q&A by other users, like/dislike, and comment to any answer.

The screenshot shows the 'College Pathfinder' forum homepage. At the top, there is a navigation bar with links: Home, Forum, Search, Compare, College Predictor, and Profile. On the right side of the nav bar, it says 'Hi srishtask04' and has a Logout link. Below the nav bar is a large teal header with the word 'Forum' in a large, stylized, blue font. Underneath 'Forum', a subtext reads 'Join the Discussion, Share Your Insights, and Connect with the Community!'. The main content area shows two posts. The first post is titled 'IIT D Mechanical Help' and is created by Ayushmaan. It contains the text 'I am confused about IIT D please help'. Below the text are 'Related Topics: IIT Delhi' and '1 Likes | 3 Views'. A green 'New Post' button is located to the right of this post. The second post is titled 'Related to IIT Kanpur EE' and is created by Ayush. It contains the text 'Hi I am from IIT Kanpur EE branch. I am here to help. If you have any questions I am happy to help'. Below the text are 'Related Topics: IIT Kanpur' and '0 Likes | 6 Views'. Another green 'New Post' button is located to the right of this post. To the right of the posts is a sidebar with a vertical list of categories: All Posts, IIT Kanpur, IIT Bombay, IIT Delhi, Academics, General, Helpful, and IIT Kharagpur. At the bottom left of the page, there is a URL: <https://college-frontend-vert.vercel.app/post/661fa8ecbc9f990043f8ea42>.

Admin Controls

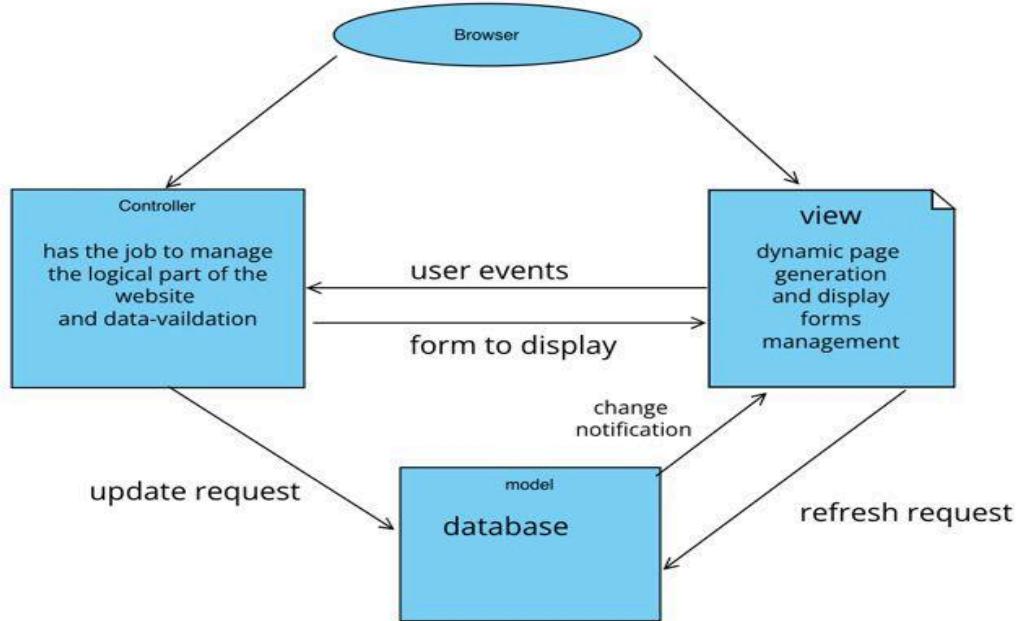
The Admin can block a user, delete their account, or delete any of their posts by navigating to their profile.

The screenshot shows a user profile page with the following elements:

- User Avatar:** A circular portrait of a man with a long white beard.
- Status:** A green button labeled "Verified".
- Action Buttons:** "Block User" and "Edit".
- Personal Information:**
 - Name: Sid
 - Email: siddxd@growthx.com
 - Phone Number: +91 49652845732
- Bookmarks:** A section containing a placeholder text block: "Lorem ipsum dolor sit amet consectetur. Erat auctor a aliquam vel congue luctus. Leo diam cras neque mauris ac arcu elit ipsum dolor sit amet consectetur."
- Professional Details:**
 - JEE Roll No.: XXXXXX
 - Email: siddxd@growthx.com
 - Coaching/Self Study: Coaching
 - Preferred Location: Mars
 - Branch Interested In: CSE (default)
 - Address: North Pole
- Manage Posts:** A dropdown menu showing four posts under "All posts":
 - Doubt 1:** Placeholder text. Buttons: "Delete Post".
 - Doubt 2:** Placeholder text. Buttons: "Delete Post".
 - Doubt 3:** Placeholder text. Buttons: "Delete Post".
 - Doubt 4:** Placeholder text. Buttons: "Delete Post".
- Report:** A section titled "JEE-A Report" with a "Verified" status and a "View More Items" button.

2 Architecture Design

College Pathfinder is a web-based application that implements a Model View Controller Architecture.



(The above image was changed)

Why are we using this:

we are using this because this website functions on handling data in multiple ways, which include having our data entered, can be fetched through college search and college compare functionality. Also, we can have this work on its own and require no any server.

We also were not sure what our future plans are and upto what extent that could be fulfilled, so mvca model works best under such dilemma.

Advantages:

1. **Distributed Logic:** With MVCA, the system's logic is distributed across multiple layers: Model, View, Controller, and Adapter. This decentralization allows for more efficient processing and reduces the risk of bottlenecking at a single point.
2. **Centralized Presentation:** The View and Adapter components handle the presentation layer, ensuring a consistent user experience across different clients. Centralizing presentation logic ensures uniformity and reduces redundancy in client-side implementations.

Disadvantages:

1. Increased Complexity: The MVCA architecture introduces additional layers and interactions, potentially increasing system complexity. Managing the interactions between models, views, controllers, and adapters requires careful design and implementation to avoid confusion and inefficiency.
2. Synchronization Challenges: As updates or changes occur in any architecture layer, ensuring synchronization between components can be challenging. Version compatibility between layers must be carefully maintained to prevent conflicts and inconsistencies.

Non-functional Requirements Challenges:

Performance:

1. Network Latency: While MVCA may reduce the dependence on direct client-server communication, interactions between layers still rely on network communications. This can introduce latency, impacting system performance.
2. Server Overload: Heavy load on the controller or adapter layers can lead to overload, affecting response times and overall system performance.

Scalability:

1. Limited Horizontal Scalability: Scaling horizontally in the MVCA architecture may encounter challenges, particularly if workload distribution across controllers and adapters is not seamless.
2. Database Scalability: Scaling the underlying database to accommodate increasing data volumes remains challenging, requiring careful consideration of database design and management strategies.

Maintainability:

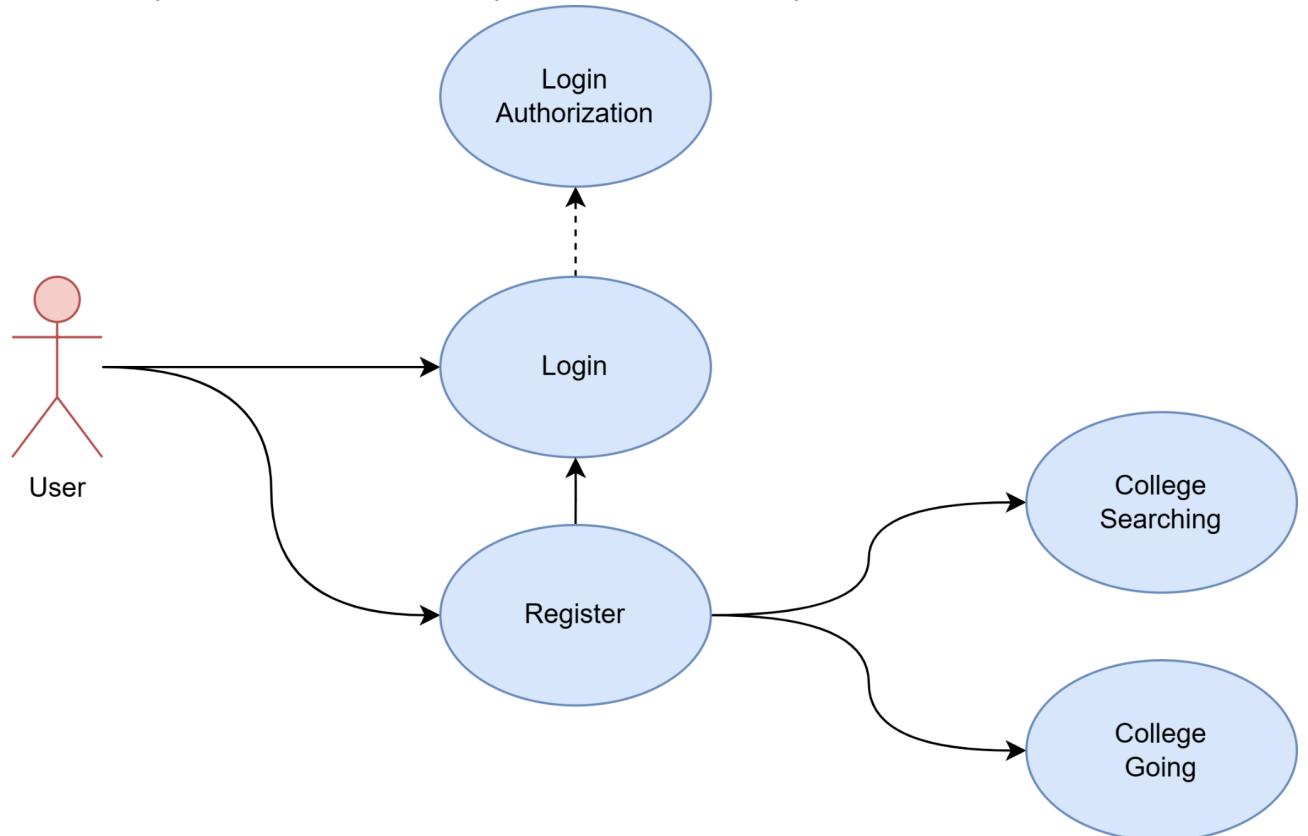
1. Complexity: The MVCA architecture can introduce complexity in maintenance, particularly when updates or changes need to be synchronized between layers. Ensuring consistency and coherence across models, views, controllers, and adapters is essential for maintainability.
2. Version Compatibility: Maintaining compatibility between different versions of models, views, controllers, and adapters can be complex. Changes in one layer may necessitate corresponding updates in other layers to ensure compatibility and functionality.

3 Object Oriented Design

3.1 Use Case Diagrams

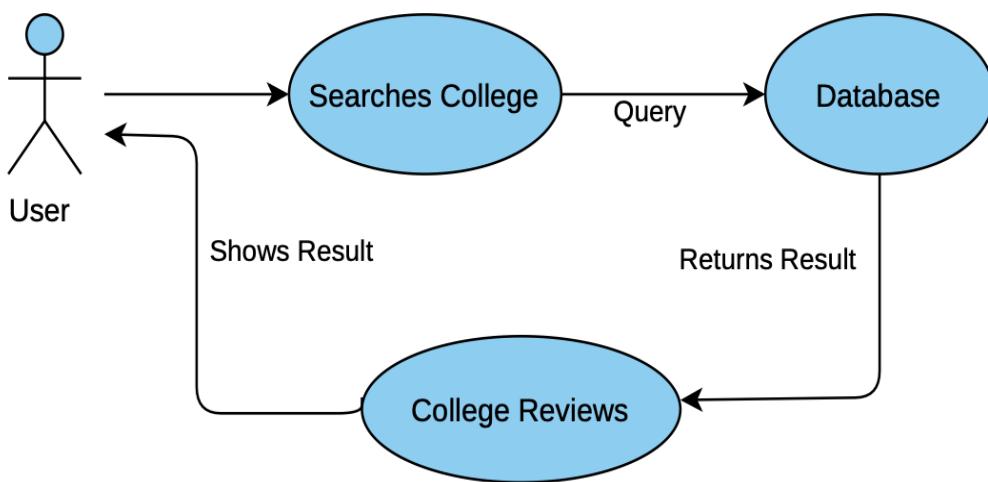
- **3.1.1 Use Case #1: Sign Up and Login**

Purpose - This use case covers login and signup for admins and students, whether currently attending college, already graduated, or currently enrolled.

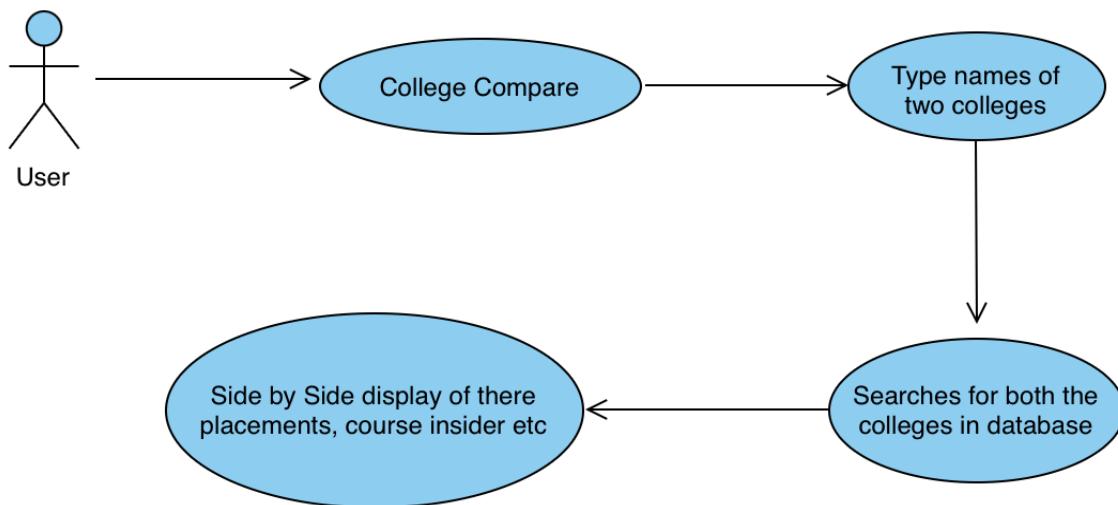


- **3.1.3 Use Case #2 Viewing Reviews**

Purpose - This use case covers the purpose of viewing reviews which gives potential students insights about academic offerings, professors, and campus culture. It enables people to make knowledgeable selections and makes the process of selecting a college that fits their preferences and aspirations easier. +



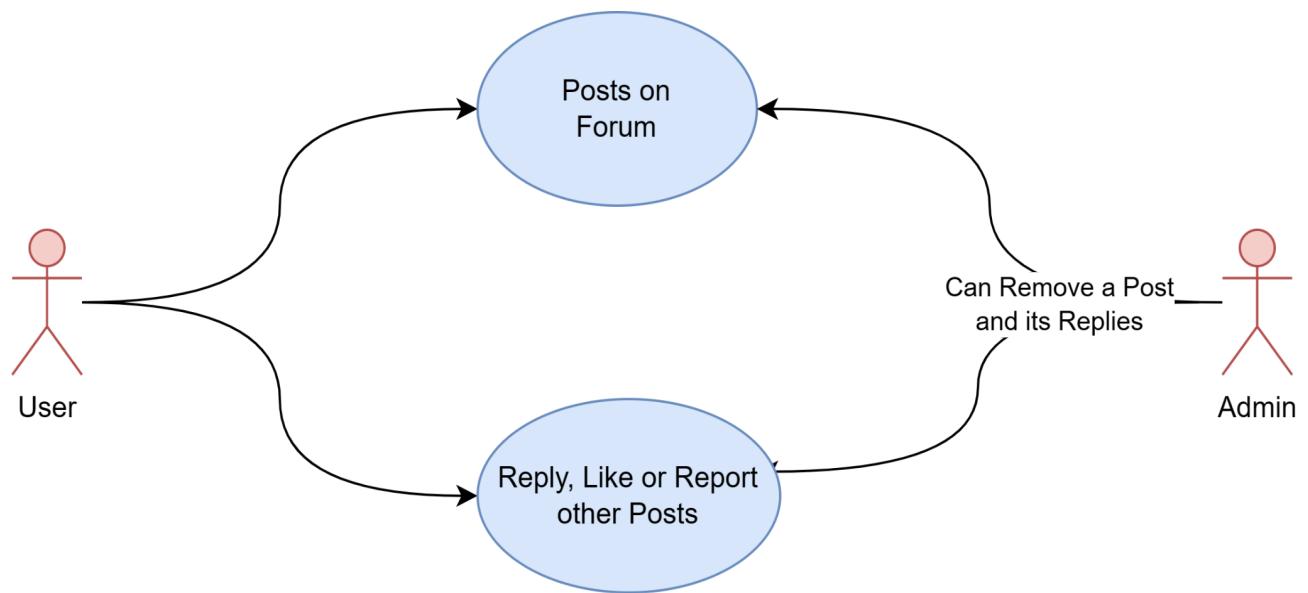
- **3.1.4 Use Case #3 College Compare**



- **Purpose** – This use case assists prospective college students in comparing two colleges directly, considering key factors to resolve various dilemmas and make more informed decisions

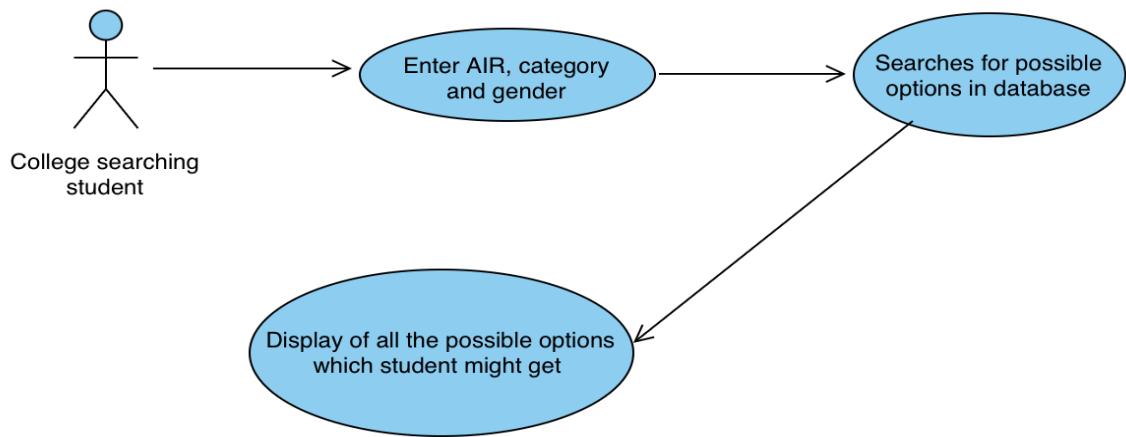
- **3.1.5 Use Case #4 Posting Question on Forum**

Purpose - This use case covers the purpose of seeking help and sharing experiences by posting questions on a forum, creating a collaborative space for diverse perspectives and valuable insights. Any user can like, dislike, or even report questions.



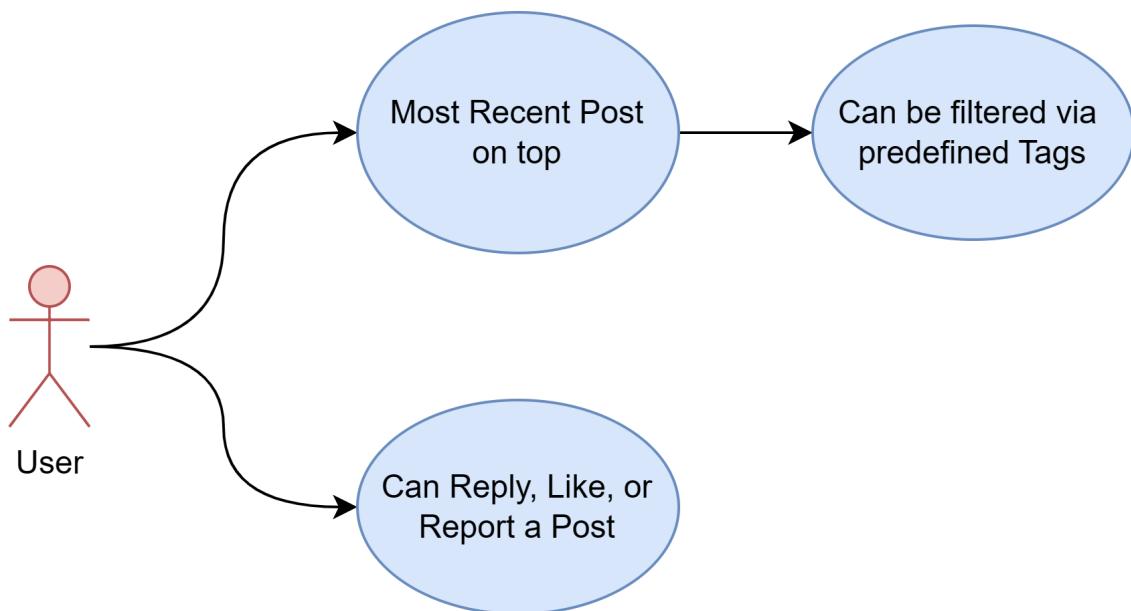
- **3.1.7 Use Case #5 Options Filter**

Purpose – This use case provides users with possible college options based on AIR, category, and gender based on previous occurrences.



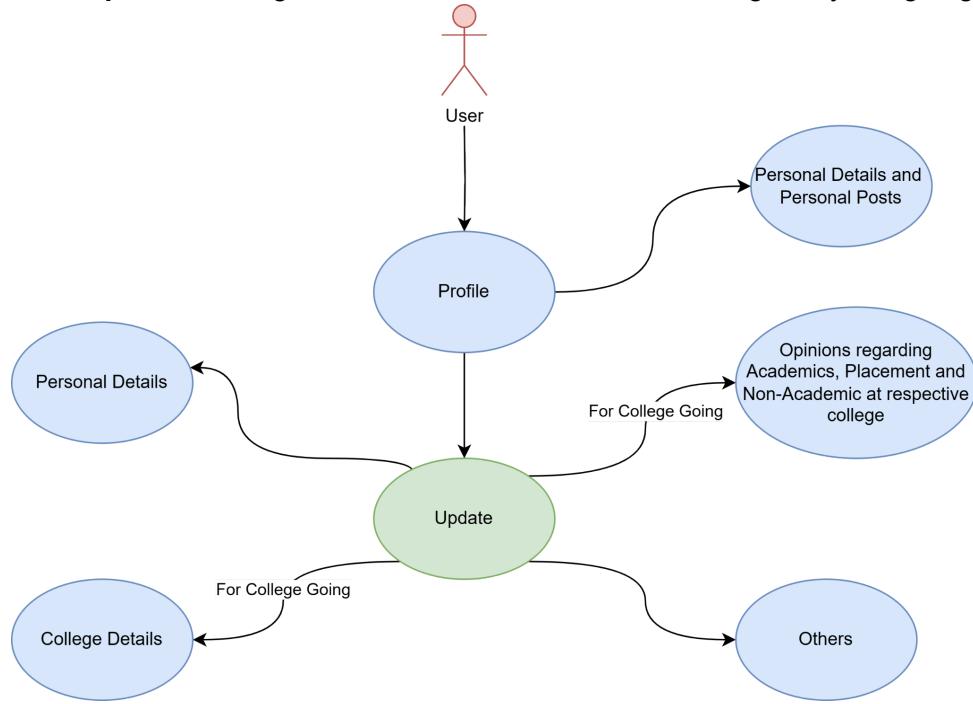
- **3.1.8 Use case #6 Replying to the messages**

Purpose – To reply to the message issued

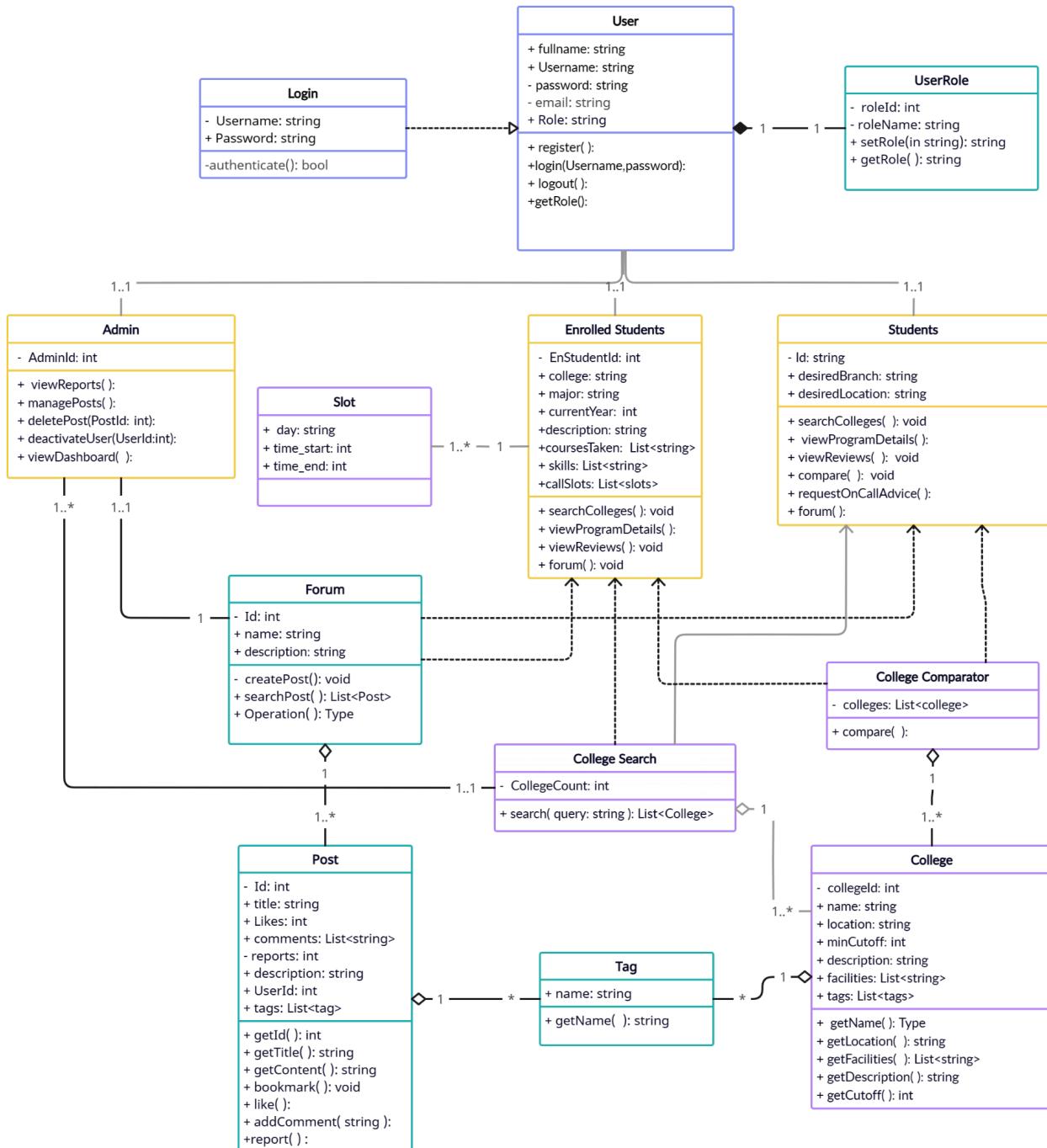


- 3.1.9 Use case #7 Updating profile

Purpose – College students can write about the college they are going

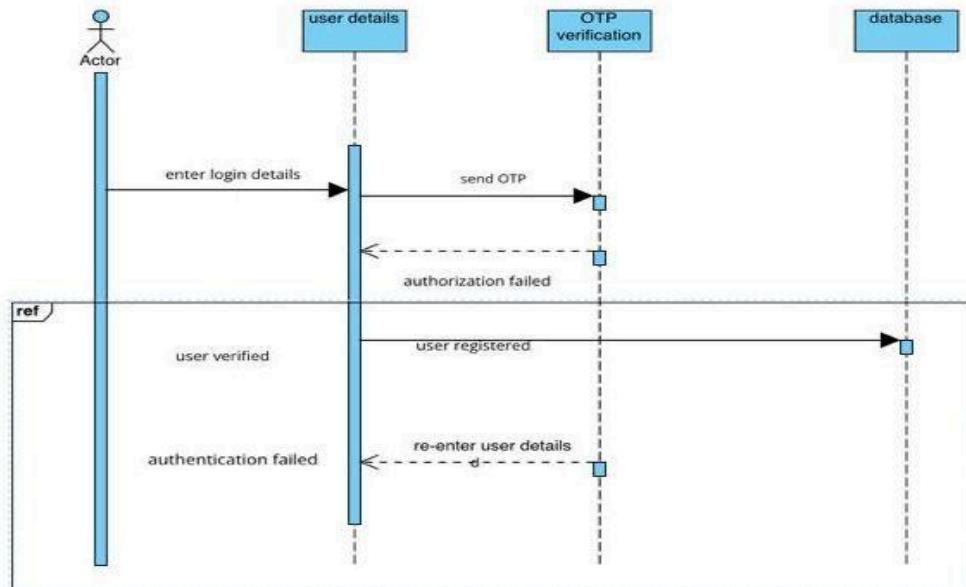


3.2 Class Diagrams

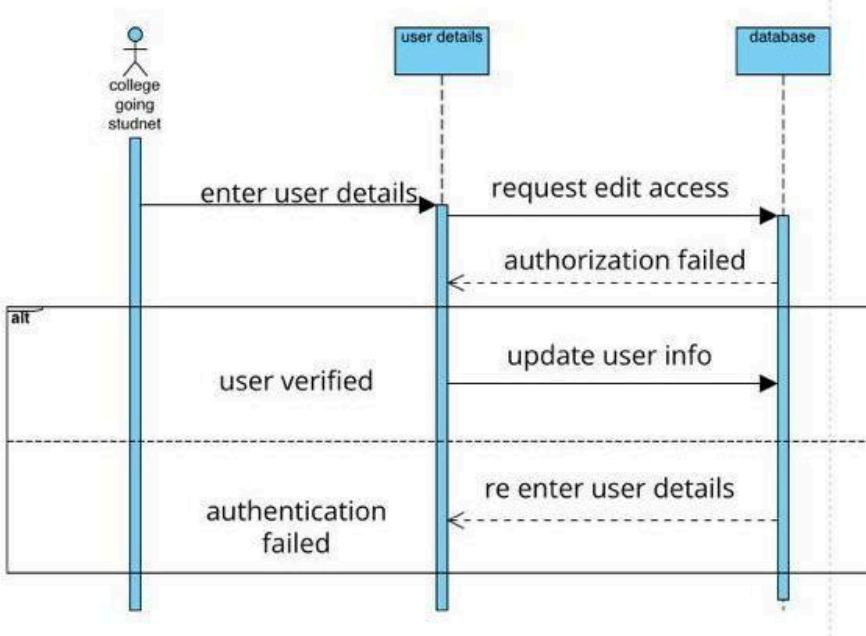


3.3 Sequence Diagrams

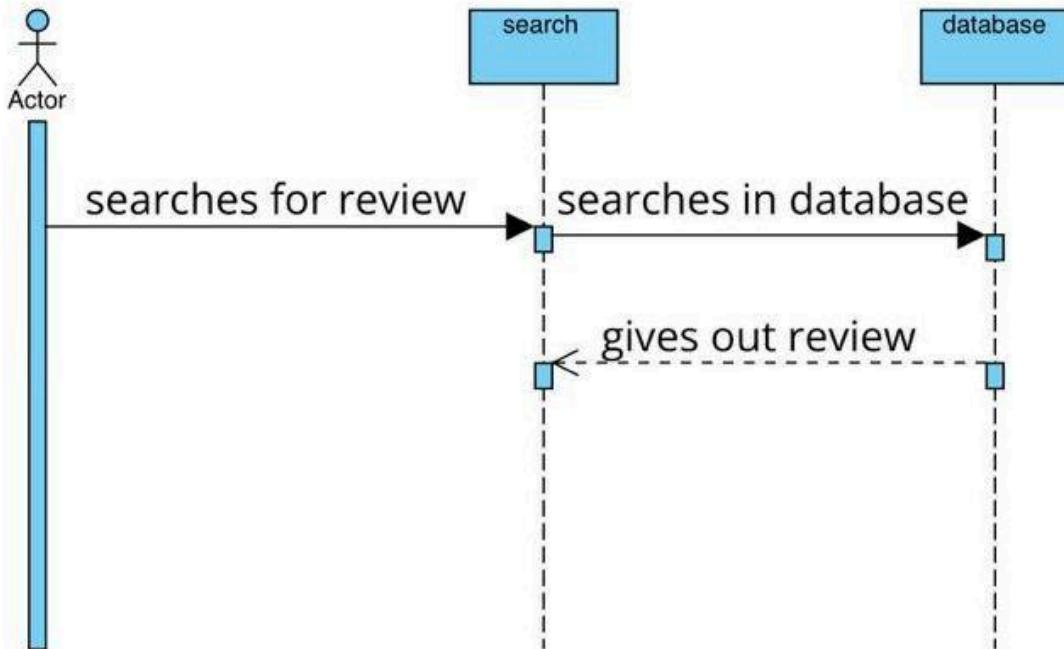
- 3.3.1 User login



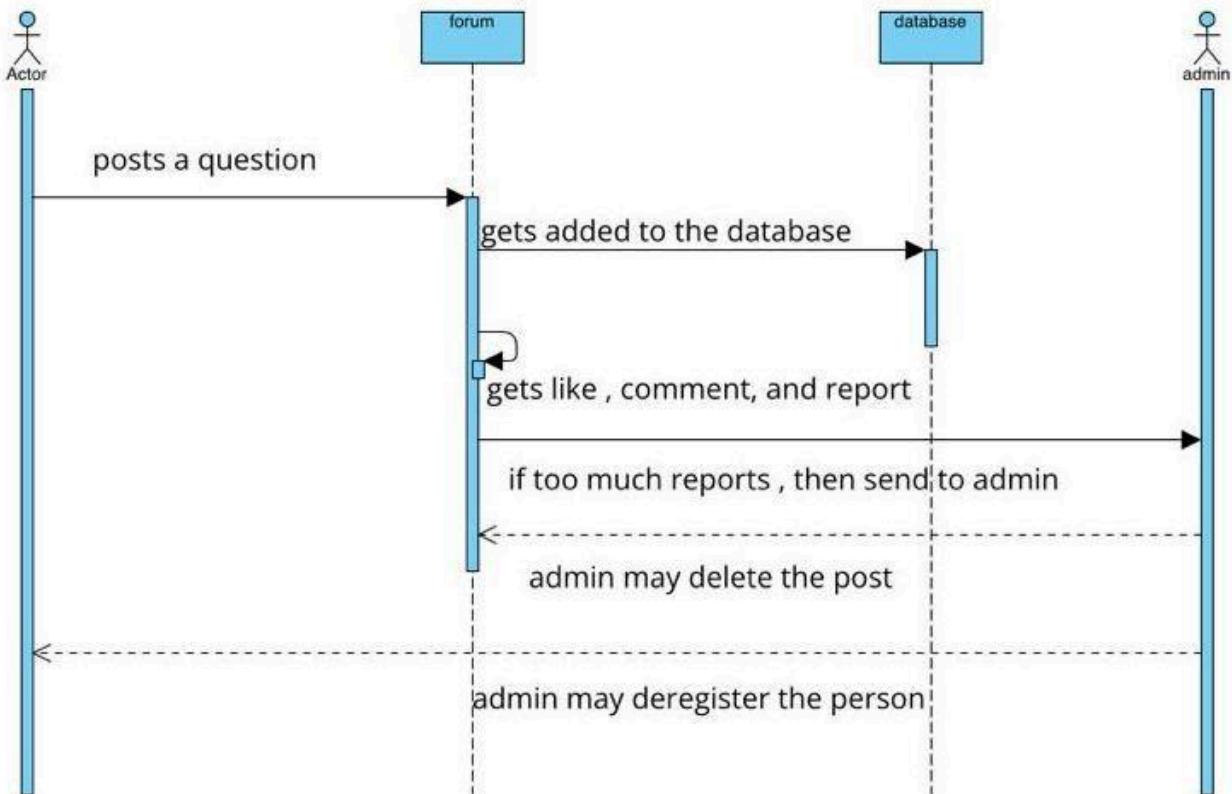
- 3.3.2 Edit profile



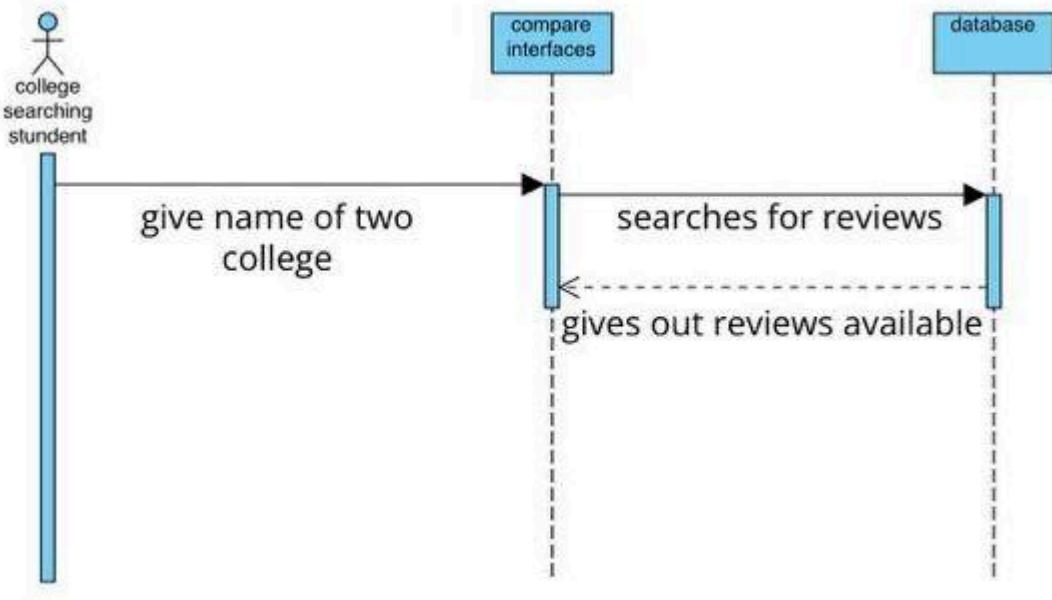
- 3.3.3 Searching for reviews after giving the name of the college and the branch



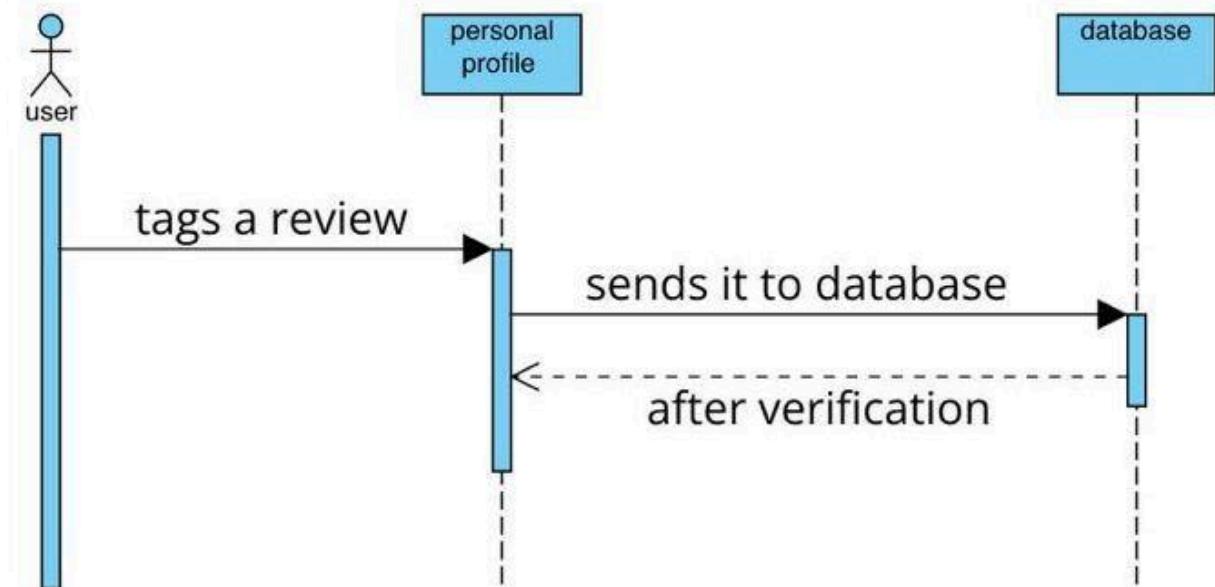
- 3.3.4 Posting questions on the forum and writing comments



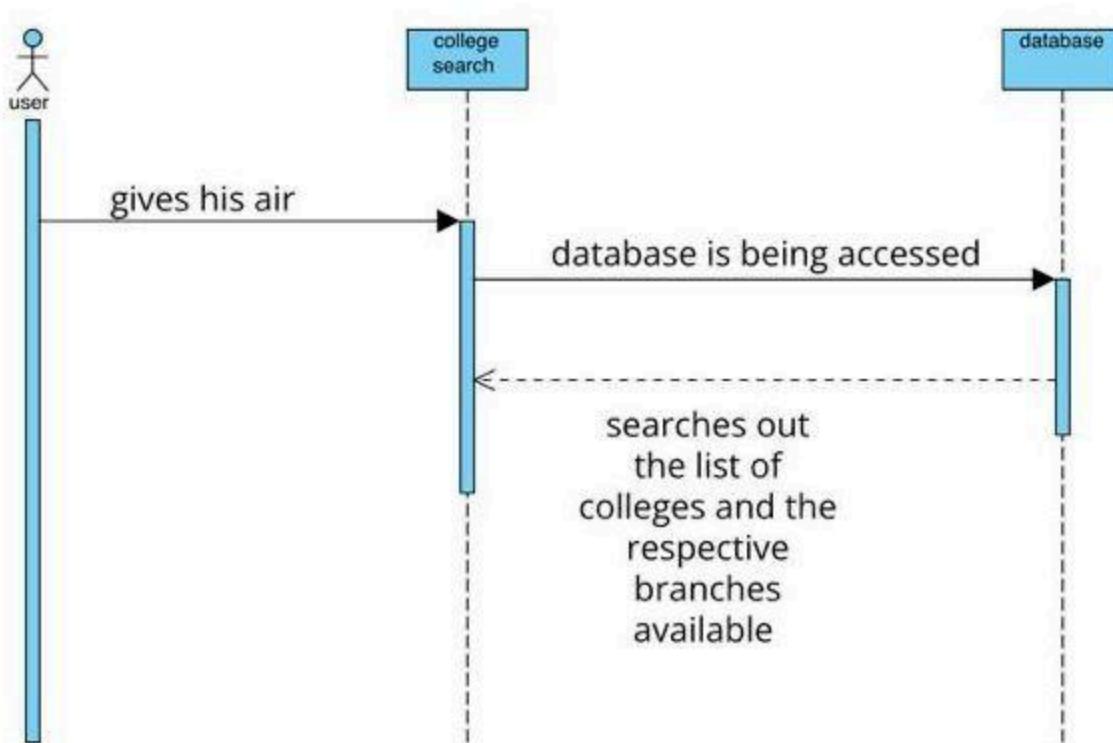
- 3.3.5 Comparing two different colleges



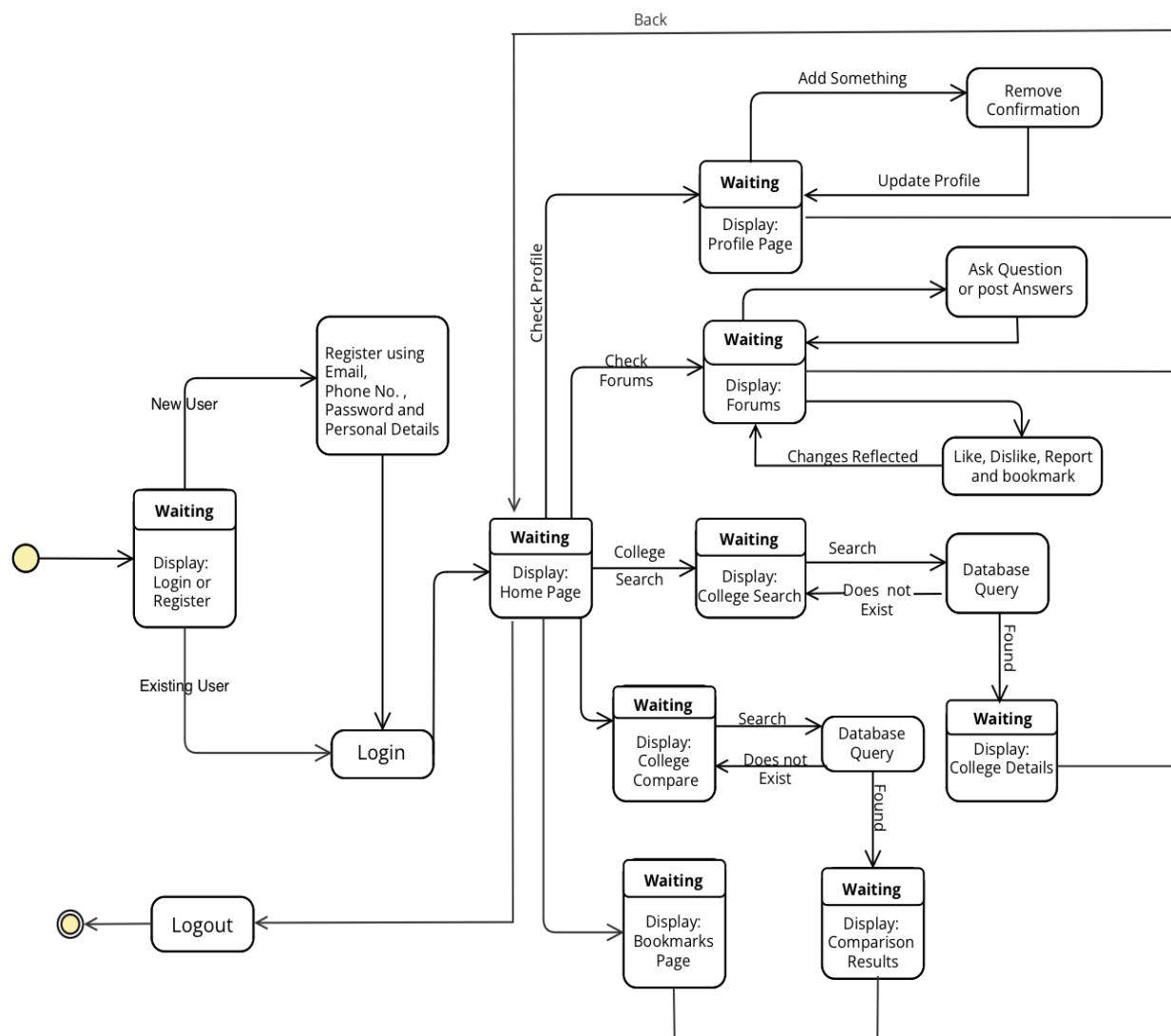
- 3.3.6 A person can bookmark whatever he finds useful by marking a tag to it



- 3.3.7 A person after giving his air, can search for the colleges available to him



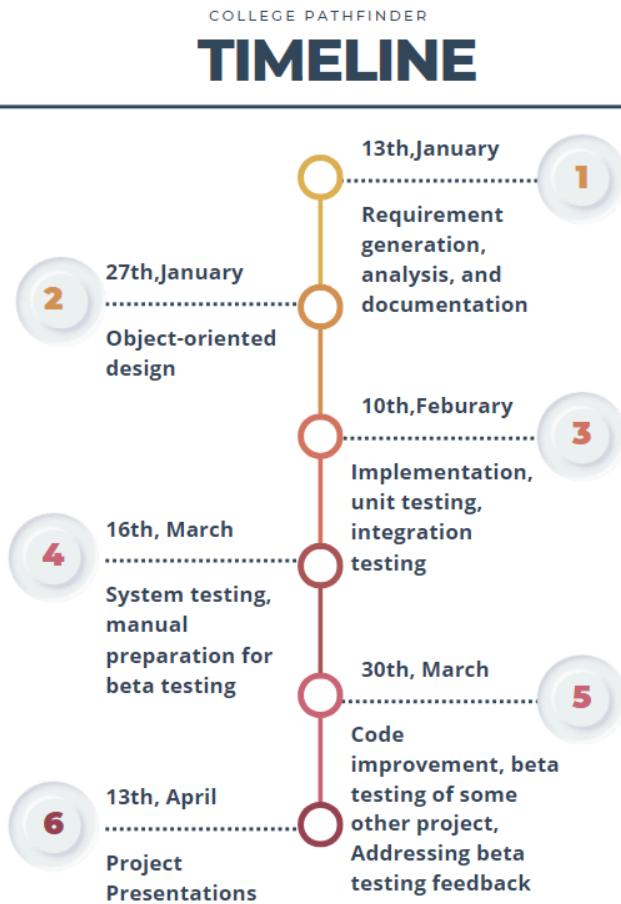
3.4 State diagram



4 Project Plan

Development timeline of College PathFinder:-

- 1) **13th January 2024 - 26th January 2024:** Documentation of Software Requirements Specification (SRS).
- 2) **27th January 2024 - 9th February 2024:** Documentation of Software Design Documentation.
- 3) **10th February 2024 - 15th March 2024:** Implementation and Testing:- Member-wise classification of tasks and the required software is given below. Significant tasks, including writing the source code, designing the web page, making and testing the unit, integrating test cases, and implementing a secure firewall, would be done during this time. Members of respective functions would do testing.
- 4) **16th March 2024 - 29th March 2024:** System and Manual Beta Testing: This week, further necessary testing will be done. This would include testing the system as a developer and (Beta) testing as an End User.
- 5) **30th March 2024 - 12th April 2024:** Code Improvement and Beta Testing:- With the results of the previous testing sessions, improvements to the software would be made to increase speed, security, and overall quality.
- 6) **13th April 2024 - 19th April 2024:** Addressing Beta Testing Feedback and Delivering the Final Project Report



The following is the broad classification of the tasks, along with the names of the team members responsible for it:-

- 1) Front-End Design:** A front-end designer creates the aesthetics and wireframes for the product and turns them into reality via code. Any component of the website that the end user can manipulate can be classified as Front End.

The members responsible for Front End Development are:-

- Astitva Roy
- Ayushmaan Jay Singh
- Mayank Gupta
- Param Soni
- Anitej Jain
- Prathamesh Baviskar
- Manan Kumar

The following software might be useful for Front End Development:-

- React JS:** A free and open-source front-end JavaScript library for building user interfaces

based on UI components.

- b. **JavaScript**: JavaScript, often abbreviated JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS.
- c. **HTML**: A standard markup language for documents designed to be displayed in a web browser.
- d. **CSS**: Cascading Style Sheets is a style sheet language used to describe the presentation of a document written in markup language such as HTML.

2) Back-End Development: It is everything the users don't see and contains behind-the-scenes activities that occur when performing any action on a website. It focuses primarily on databases, backend logic, APIs, and Servers.

The members responsible for back-end development are:-

- a. Prathamesh Baviskar
- b. Anitej Jain
- c. Ayush Meena
- d. Manan Kumar

The following software might be helpful in back-end development:-

- a. **JavaScript**: Can be used for both front- and back-end development.
- b. **MySQL**: MySQL is an open-source relational database management system.
- c. **Node.js**: Node.js is an open-source, cross-platform, back-end JavaScript runtime environment that runs on the V8 engine and executes JavaScript code outside a web browser.
- d. **MongoDB**: MongoDB is a free, open-source document-oriented database popular among web developers.

Appendix A - Group Log

S.No.	Date	Timing	Description
1	27/01/2024	3:30 pm - 4:15 pm	Studied the template given and distributed the work amongst the team members. Also distributed the team according to the development roles.
2	31/01/2024	4 pm - 7 pm	Online meeting with the group members and collaboratively proceeded with the sections of the design document.
3	3/01/2024	5:45 pm - 6:30 pm	Redistributed the remaining work and reviewed the progress of the design document.
4	8/01/2024	6:00 pm - 6:30 pm	Discussed the feasibility of various parameters with our mentor.
5	9/01/2024	2:00 pm - 4:00 pm	Added final touches to the document and assembled it.