FAST- NATIONAL UNIVERSITY OF COMPUTING AND EMERGING SCIENECES

FYP 1-Final Report

F23-138-D-Brainy Mingle

Group Members: 20I-2301 Muqadisa Ejaz
20I-2375 Aimen Arshad
20I-1872 Maria Wasif

Supervisor: Ms. Maheen Arshad Malik

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1. Introduction:

Our final year project aims at building an android application namely “Brainy Mingles” integrated with AI algorithms to revolutionize the university journey of students. In this digitized era of personalization and customization our AI driven system aligns the juniors with the perfect mentors and project partners and promotes a vibrant learning community. We are committed to redefine the high education experience by personalized learning, fostering collaboration and providing students with all the support they need to succeed in this modern era. Below provided is the detailed vision of our project including documentation and design:

2. Project Vision

2.1. Problem statement:

At university level the gap between seniors and juniors is a prominent issue faced by most of the university students. The lack of personalized mentorship programs which can empower students is a prevalent issue. Not only this but also the absence of a centralized platform which limits the student’s access to valuable resources and group study material. In addition to this, in the final year of university, there is a crucial challenge faced by most students that is to assemble an ideal team for their final year project. As rightly said, out of challenges comes a chance to make things better; all these issues motivated us towards the idea of creating Brainy Mingles, through which we can provide one single place that provides solutions to all these issues all together.

2.2. Business Opportunity:

E-learning is an emerging educational paradigm. To not only restrict it to the teacher student interaction but also letting students at different levels to interact among each other and learn from each other's experience and expertise, we will introduce brainy mingles in the industry. We can sell the application to multiple educational institutions helping them to promote a knowledge sharing environment. In addition to this after its success, we will be open to deals for ads for marketing purposes of different platforms.

2.3. Objectives and Goals:

The main goal of Brainy Mingles is to enhance the university experience for students and connect students from different academic and skill levels to facilitate the exchange of resources and knowledge among students. To facilitate collaborative learning and effective mentorship, we aim to provide a secure and user-friendly environment, which will meet the evolving needs of the students. So, our goal is to empower students. We aspire to strengthen and upgrade the university journey with the resources and the connections. Brainy Mingles strives to be a

catalyst for success, contributing to the academic growth of each student who will be a part of our vibrant community.

2.4. Project Scope:

Brainy Mingles, a mobile based dynamic platform aims to connect university students to enhance the way they learn and excel during their graduation journey. The seniors and the juniors can interact among themselves and help their fellows increase their knowledge, skills, and overall academic performance. Brainy Mingles will manage the profile of all the students. The students can apply for mentor positions and the applications would be managed by the faculty who will be able to accept or reject the applications by considering their skills. The juniors can have online and physical sessions with the mentors for group study purposes. To help other students while considering the seniors for mentorship, the juniors will be able to add reviews and ratings for the mentor. Brainy Mingles introduces an innovative mentorship program that spans an entire semester for tailored academic advancement, facilitated by a payment system. To motivate and support juniors, the mentors can share valuable materials on the platform making it easier for the juniors to access all the resources at one centralized location. Push notifications, and in-app messaging, create a vibrant hub of information exchange. Brainy Mingles, combined with an AI algorithm, recommends mentors to the juniors by aligning junior's requirements with the mentor's expertise. AI also eases the process of making final year project groups by connecting the students with similar interests. Overall, Brainy Mingles empowers students through dynamic connections and resourceful collaboration.

2.5. Constraints:

Our application is restricted by a constraint most known as a triple constraint which constitutes scope, schedule, and cost. Our project's scope involves the specific goals, deliverables and tasks that are defined, and they specify the boundaries of the project, and we cannot go beyond those boundaries. As for the schedule, we have specific deadlines for all the deliverables, when our performance will be evaluated by the panel, so all the defined tasks are to be completed within a time frame. The cost to develop this application is in terms of human resources. As constrained by the university we are limited to a team of 3 members and we must completely design, develop, implement and document our project. Other costs might include some API keys which are necessary for the application to work properly and deploying the application in the real world.

2.6. Stakeholders Description:

We are building application for our final year project and the people involved are:

- **Developers:**

  The team involved in the development of this project holds a central position among the Internal stakeholders due to their substantial time investment. They have a high influence on the project tasks and iterations and the whole success of the project depends on how they formulate the strategy, execute the iterations, and perform day to day tasks.

- **Users:**

1. **Junior Students:** These are the primary users of Brainy Mingles. Their engagement and satisfaction are the key factors and play an important role in the success of our application.
2. **Mentors/Senior Students:** Seniors of the university serve as mentors. Their participation is vital in providing support to the junior students.
3. **Admin:** Admin holds the central authority of our system monitoring all the operations of our project, making him the vital member of our application.
4. **Faculty Members:** The guidance and academic oversight of the faculty members is important for a project's success.

- **Others**:

1. **Panel Members:** The comments made by the panel play an important role in the improvement of the application. Their evaluations are important for the application's success.
2. **Supervisor:** The success of the application majorly depends on the supervisor. The supervisor's collaboration and guidance play an important role in the completion of the project.

2.6.1 Stakeholders Summary

Any changes in the system may be in development or deployment are going to directly affect the stakeholders.

Stakeholder 1
Name: Developers
Represents: FYP Team Members
Role: The developers want the product to react to changes according to their requirements while being both efficient and effective.

Stakeholder 2
Name: Users
Represents: Students, Admin, Faculty members
Role: The users want the product to deliver value with ease and simplicity. They want the product and service quality to be pristine while the developers want their investment to be worthwhile.

Stakeholder 3
Name: Evaluators
Represents: supervisor, panel members
Role: The evaluations are important for the application's success. The collaboration and guidance of the panel members and supervisor play an important role in the completion of the project. Therefore, maintaining a close relationship with them and keeping them satisfied is important.

2.6.2 Key High-Level Goals and Problems of Stakeholders

High-Level Goals
1. Improving educational experience through personalized recommendations
2. Timely deployment

3. Product requirements are fulfilled
4. Maintaining the system
5. Providing a vibrant community for resource sharing and connections.

Problems of Stakeholders

1. Security and privacy concerns of sensitive data
2. Effective engagement of users
3. Acceptance of change
4. Resources are limited specifically the human resources.
5. Tight schedules and other semester commitments of the developers

3. Software Requirement Specification

Provided below is the detailed high-level overview of our project. The key features of our application and the functional and nonfunctional requirements to carry out those key features are explained below. The following section serves as a roadmap for basic understanding of the project's purpose and its outcomes, specifying the working of our application.

3.1. List of features:

3.1.1 Login

Brainy Mingles allows users to login using username and password to the system and access role-based functionalities.

3.1.2 Signup

Brainy Mingled allows students and mentors to get registered to the system by entering the correct credentials.

3.1.3 Forgot Password

Brainy Mingles allows users to change the password whenever required.

3.1.4 Profile Management

Brainy Mingles allows users to manage their profiles by updating their profile pictures, interests, and preferences.

3.1.1 Mentor Recommendation

Brainy Mingles uses AI algorithms to align the interests and requirements of the students and the interests and skills of the mentors and then suggest the best aligned mentors to the students.

3.1.2 Mentor Hiring

The students can hire the registered mentors for semester-long guidance. By hiring mentors, students gain access to one-on-one guidance from experienced mentors.

3.1.3 Bidding

When registering, the mentors will provide the budget to offer their services, now Brainy Mingles allows the students to bid their preferred fee, both parties will come to a mutually agreeable fee after which the mentor will be hired by the students.

3.1.4 Session Arrangement
Users can arrange sessions for studies using our platform. Brainy Mingles provide the options to arrange a physical session or an online session. Based on the mutual availability for both sessions and the room availability for physical sessions, a session is arranged for the mentor and the students to interact.

3.1.5 Video Call
Brainy Mingles provides the facility of secure and reliable video calls enabling real time face to face interaction between the students and the mentors making it easier for students to seek guidance and the mentors to explain the complex concepts.

3.1.6 Payment
Brainy Mingles facilitates the secure payment process. When the students hire mentors for semester-long guidance, they will pay the mentors for their services. Making everything centralized, we will allow the users to make transactions through our application.

3.1.7 In app messaging
Enhancing real time interaction among the peers, our application will let the students and the mentors communicate using text messages through Brainy Mingles terminating the need of any external communication platform.

3.1.8 Screen sharing
For collaborative learning, visual demonstrations and efficient sessions, Brainy Mingles allows the participants of the video call to share their screens. This feature contributes to effective mentorship.

3.1.9 Resource Sharing
Brainy Mingles centralizes the sharing of various study materials and resources. The users will be able to upload, access and view all these resources within the application. This will ensure an effective learning environment with a wealth of resources all at one place.

3.1.10 Announcements
Brainy Mingles will allow the users to make announcements to their peers on the platform. To ensure a better and respectful community, all the announcements added by the users will first get approved by the admin and then they will be posted publicly on the platform.

3.1.11 User management
Brainy Mingles provide the admin with the authority of managing user profiles. The admin has complete control over the profile management capabilities, authentication, and profile updates.

3.1.12 Reporting and blocking
To ensure a safe and respectful learning environment, the application is incorporated with a reporting feature. The users can report their peers for disrespectful behaviour or inappropriate content. The admin will be able to review all the reports and after verifying the valid complaints, the admin can block the reported user from the platform.

3.1.13 Fyp group member suggestions

Brainy Mingles uses AI algorithms to align the interests and requirements of the students of final year and then suggest the best aligned partners to the students, facilitating the formation of an effective project team.

3.1.14 Verification of final year students

To ensure that only final year students will access the functionalities implemented for them and to avoid the misuse or abuse of the application, before providing the access of these functionalities, Brainy Mingles will verify the credit hours earned by the students through their transcript and provide the access only to those who meet the criteria.

3.1.15 Mentorship Approval

When the user applies for the mentorship program, the faculty member will have the authority to accept or reject the application by analysing their skills and expertise. This will ensure the standard quality of the mentorship program.

3.1.16 Ratings and feedback

The application empowers users to provide feedback and ratings to the mentors, which will then be displayed on the mentor's profile promoting transparency and continuous improvement within the Brainy Mingles community.

3.2 Functional Requirements:

- Brainy Mingles shall allow the users to create their profiles providing personal information.
- Brainy Mingles shall allow the users to login to their account using correct credentials.
- Brainy Mingles shall allow the users to manage their accounts and update their information when required.
- Brainy Mingles shall recommend mentors to the students based on their interests and requirements by utilizing the AI algorithms.
- Brainy Mingles shall provide the list of the recommended mentors to the students specifying all their details like expertise, profiles, and availability.
- Brainy Mingles shall allow the senior students to apply for mentorship positions.
- Brainy Mingles shall allow the faculty members to review the mentorship applications.
- Brainy Mingles shall allow the faculty members to accept or reject the mentorship applications.
- The Brainy Mingles shall allow the students to browse through the mentor profiles.
- Brainy Mingles shall allow the students to hire mentors for a course for whole semester guidance.
- The Brainy Mingles shall allow students to hire a mentor for a course.
- The Brainy Mingles shall allow the mentors to provide their mentorship fee to provide the services.
- The Brainy Mingles shall allow the students to bid their prices to the mentors to ask for mentorship.
- The Brainy Mingles shall allow the students to pay the mentors through the system using bank accounts or easy paisa when applying for full semester hiring.
- Brainy Mingles shall provide the students with the bidding mechanism to request mentorship from mentors.
- Brainy Mingles shall allow the users to adjust the schedule for the video call session.
- Brainy Mingles shall provide a secure and reliable video call feature for online sessions.
- Brainy Mingles shall allow the students to request a session on a topic from a mentor.
- Brainy Mingles shall allow the users to share their screens during the online sessions.

- Brainy Mingles shall allow the mentors to arrange physical sessions by specifying the time and room number.
- The Brainy Mingles shall set the limit for students so that they can not take more than three single sessions for the same course.
- The Brainy Mingles shall allow the users to connect with their peers using in app messaging.
- The Brainy Mingles shall allow the students to rate and provide feedback to the mentors.
- The Brainy Mingles shall allow the users to share resources at a centralized location.
- The Brainy Mingles shall allow the students to view the resources posted by their peers.
- The Brainy Mingles shall allow the users to report inappropriate content or behavior .
- The Brainy Mingles shall suggest the potential group members to the final year students based on the skills and interests.
- The Brainy Mingles shall verify the credit hours earned by the mentor to be able to access functionalities of final year students.
- The Brainy Mingles shall allow the admin to manage the profiles of the other modules i.e., students, faculty members, and mentors.
- The Brainy Mingles shall allow the admin to report or block a user in case of any scams, and frauds.
- The Brainy Mingles shall allow the users to request admin to post announcements.
- The Brainy Mingles shall allow the admin to approve the announcements made by the other students, faculty, and mentors to post them.

3.3 Non-Functional Requirements

Security:

- Brainy Mingles will enforce secure login procedures for students, teachers, and mentors by utilizing their NU IDs. This authentication process will involve sending confirmation emails to their registered addresses.
- Role-based access control will be implemented by Brainy Mingles, restricting visibility of Final Year Project (FYP) functionality to final year students only.
- To maintain payment method confidentiality, Brainy Mingles will employ encryption techniques, safeguarding the privacy of sensitive financial information.

Usability and User Interface:

- Brainy Mingles will feature a user-friendly interface, accommodating individuals with varying technical skills.
- The platform's design will exhibit uniform and coherent visual elements throughout for a consistent user experience.

Responsiveness:

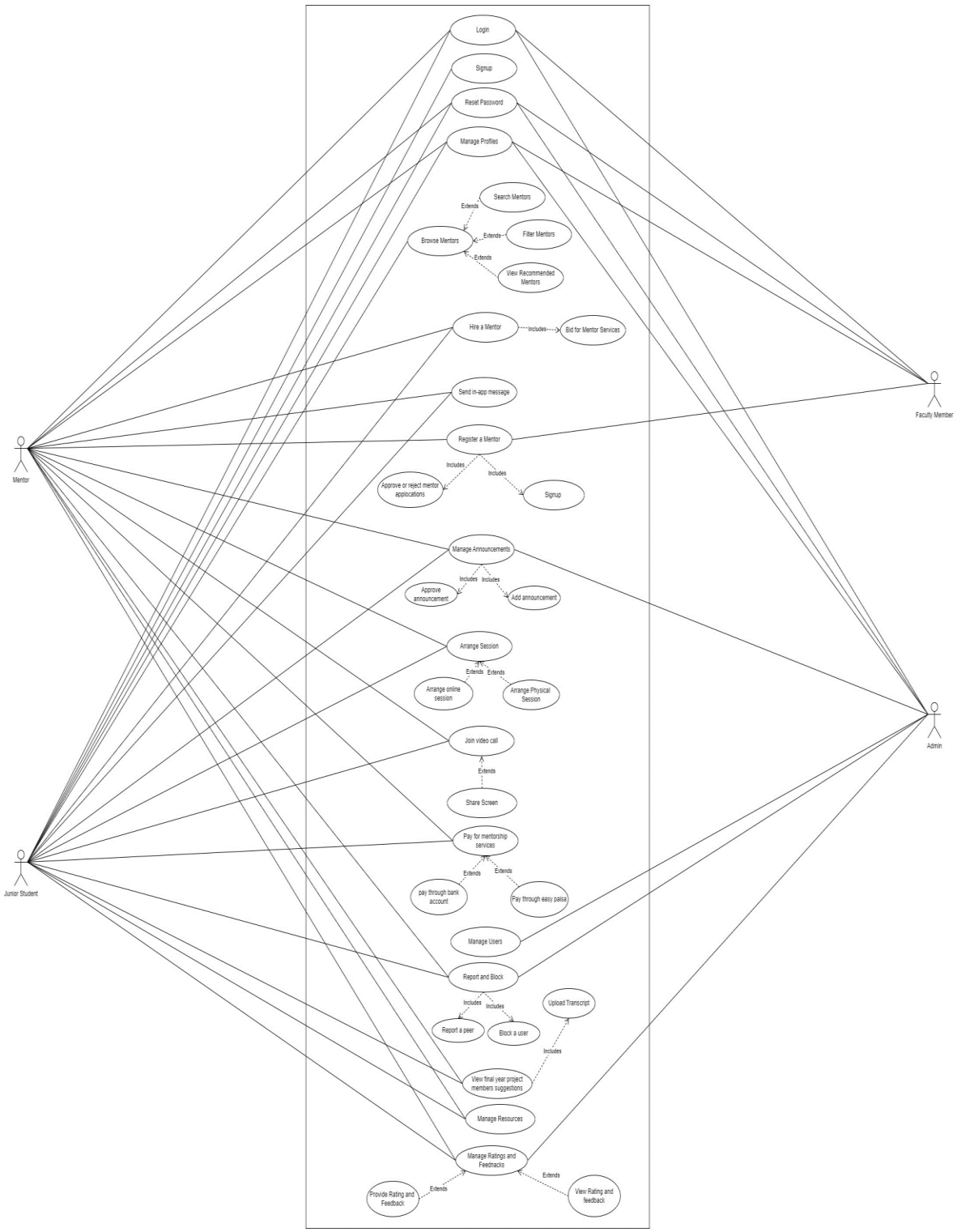
- Brainy Mingles shall adjust the content to different screen sizes.

Maintainability:

- The Brainy Mingles shall ensure the code to be well-organized which will help us to make changes or enhancements in the future.

4. Software Design

1. Use Case Diagram



2. High Level Use-cases

- **Login**

Use Case name	User Login
Type	Primary
Actors	Student, Mentor, Faculty Member, Admin
Description	This use-case describes the process of user logging into the "Brainy Mingles" application before accessing all the functionalities of the Brainy Mingles

- **Student Registration**

Use Case name	Student registration
Type	Primary
Actors	Student
Description	This use case describes the process of a new student who wants to join the Brainy Mingles application.

- **Mentor Registration**

Use Case name	Mentor registration
Type	Primary
Actors	Mentor
Description	This use case describes the process of a new mentor who wants to join the Brainy Mingles application.

- **Forget Password**

Use Case name	Forget Password
Type	Secondary
Actors	Student, Mentor, Faculty Member, Admin
Description	This use case describes the process of a user resetting their password in case they have forgotten their already set password.

- **Session Arrangement**

Use Case name	Session arrangement
Type	Primary
Actors	Mentor, Students
Description	This use-case describes the process of a student requesting the single session from the mentor and the mentor accepting or rejecting the session after reviewing the request.

- **Mentor Recommendation:**

Use-Case name	Mentor Recommendation to Students
Type	Primary
Actors	Student, Mentor
Description	This use-case describes the process of recommending mentors to the students by aligning student's data with the mentor's data.

- **Bidding**

Use-Case name	Bidding
Type	Primary
Actors	Mentor, Students
Description	This use-case describes the process of a student making a bid to mentor by entering the budget and the mentor accepting or rejecting the after reviewing the request.

- **In-app Notifications:**

Use Case name	In-app notifications
Type	Secondary
Actors	Student, Mentor, Faculty Member, Admin
Description	This use-case describes the process of timely delivery of notifications to the users within the application. The events such as mentorship request, mentorship session invitation, new messages, or any important announcements will trigger the notifications.

- **Video Call:**

Use Case name	Video Call
Type	Secondary
Actors	Student, Mentor
Description	This use-case describes the process initiating and conducting a video call between the student and mentor within the application.

3. Extended Use Cases

- **Login**

Use Case Id	UC-1
Use Case name	User Login
Actors	Student, Mentor, Faculty Member, Admin
Description	This use-case describes the process of user logging into the "Brainy Mingles" application before accessing all the functionalities of the Brainy Mingles
Trigger	The user launches the Brainy Mingles application
Pre-Condition	• Brainy Mingles must be installed and working on user's device. • The user already has a registered account on Brainy Mingles application
Post Condition	• The user is logged in to the application. • The user profile is displayed to the user
Normal Flow	1. The user opens the Brainy Mingles application. 2. The application displays the login screen asking for user's credentials. 3. The users enter their registered username and password. 4. The application verifies the user's account by verifying the credentials against the database. 5. If the credentials are correct, the user is logged into the application. 6. The system directs the user to the home page of the application. 7. The user can now access all the functionalities offered by the Brainy Mingles.
Alternative Flow	Step 5: If the user enters incorrect credentials, an error message is shown, and the user is asked to re-enter their credentials.
Exception	If the application crashes due to any exception such as database connection failure or server issues, the application must inform the user by displaying the error message.
Frequency of use	High
Special Requirement	• Password must be securely stored and transmitted. • The login process must be secure, and it must protect user data
Assumption	• The user has an active internet connection to access the application's functionalities.

- **Student Registration**

Use Case Id	UC-2
Use Case name	Student registration
Actors	Student
Description	This use case describes the process of a new student who wants to join the Brainy Mingles application.
Trigger	The student initiates the process of signing up as a student.
Pre-Condition	The Brainy Mingle application is installed and running on a student's android device.
Post Condition	The student has successfully created their account on Brainy Mingles application.
Normal Flow	1. The student launches the "Brainy Mingles" application. 2. The student opens the "Sign up" page. 3. The student selects the "Sign up as Student" option. 4. The application displays the sign-up screen asking for the details to be entered. 5. The student enters the following details: a. Full name b. Email c. Phone number d. Password e. Confirm password. f. Username 6. The application validates the entered information and verifies their completeness and accuracy. 7. If all the entered details are valid, the application proceeds to the next step. 8. The application asks the students to provide additional information i.e., their interests and the challenges they face in different categories including. a. Programming languages b. Programming Domain c. Courses d. Personality traits e. Preferences i. Session type (online or physical)

	ii. Mentor gender (female or male) iii. Session frequency (single sessions or mentorship program) 9. The student enters the requested additional fields. 10. The application validates and stores the additional details into student's profile. 11. The application generates a unique Id against a student and save the record in the database. 12. The student is directed to the homepage of the application
Alternative Flow	Step 7: • If any of the asked fields are left blank the application prompts the student to properly fill all the required fields • If the student is not using nu account to register to the application, application will display message asking them to correct the email address. • If the email entered is already registered, the student will be notified and asked to register with different email. • If the password and confirm password field does not match, the student will be asked to enter the password again.
Exception	In any case of application failure, the process will be stopped, and students will be asked to try again later.
Frequency of use	This use case is used when a new student wants to register to our application
Special Requirement	• A verification code must be sent to student's email id and phone number for confirmation
Assumption	• The student has a stable internet connection to register account to Brainy Mingles Application

- **Mentor Registration**

Use Case Id	UC-3
Use Case name	Mentor registration
Actors	Mentor
Description	This use case describes the process of a new mentor who wants to join the Brainy Mingles application.
Trigger	The mentor initiates the process of signing up as a mentor.

Pre-Condition	The Brainy Mingle application is installed and running on a mentor's android device.
Post Condition	The mentorship application has successfully been sent to the faculty member for acceptance.
Normal Flow	1. The mentor launches the "Brainy Mingles" application. 2. The mentor opens the "Sign up" page. 3. The mentor selects the "Sign up as Mentor" option. 4. The application displays the sign-up screen asking for the details to be entered. 5. The mentor enters the following details: a. Full name b. Email c. Phone number d. Password e. Confirm password. f. Username g. Budget h. Gender 6. The application validates the entered information and verifies their completeness and accuracy. 7. If all the entered details are valid, the application proceeds to the next step. 8. The application asks the mentor to provide additional information i.e., their expertise and skills they have in different categories including. a. Programming languages b. Programming Domain c. Courses d. Personality traits e. Preferences i. Session type (online or physical) ii. Session frequency (single sessions or mentorship program) 9. The mentor enters the requested additional fields. 10. The application validates and stores the additional details into mentor's application. 11. The application generates a unique Id against a mentor application and save the record in the database. 12. The application is sent to the faculty member so that they can accept or reject the request.
Alternative Flow	Step 7: • If any of the asked fields are left blank the application prompts the mentor to properly fill all the required fields

	• If the mentor is not using nu account to register to the application, application will display message asking them to correct the email address. • If the email entered is already registered, the mentor will be notified and asked to register with different email. • If the password and confirm password field does not match, the mentor will be asked to enter the password again.
Exception	In any case of application failure, the process will be stopped, and the mentor will be asked to try again later.
Frequency of use	This use case is used when a new mentor wants to register to our application
Special Requirement	• A verification code must be sent to mentor's email id and phone number for confirmation
Assumption	• The mentor has a stable internet connection to register account to Brainy Mingles Application

- **Forget Password**

Use Case Id	UC-4
Use Case name	Forget Password
Actors	Student, Mentor, Faculty Member, Admin
Description	This use case describes the process of a user resetting their password in case they have forgotten their already set password.
Trigger	The user initiates the "forget password" by clicking on the Forget Password link on the login page
Pre-Condition	• The user must have a registered account on Brainy Mingles application. • The Brainy Mingles application is installed and running on the user's android device.
Post Condition	The user's password is successfully reset.
Normal Flow	1. The user opens the Brainy Mingles application. 2. The user selects the "forget password" option from login page. 3. The Brainy Mingles application prompts the user to enter the registered email address. 4. The user enters the email address.

	5. The Brainy Mingles application validates the email address against the database. 6. If the email entered is valid, the application sends an email to user's provided email containing a code to reset the password. 7. If the user receives the code, the user enters the provided code. 8. The application directs the user to the reset password page. 9. The user enters the new password and confirms it. 10. The application validates the new password and confirms that password and confirm password fields match. 11. If the password is valid and both the fields matches, the application updates the user's password. 12. The application notifies the user that their password has been reset.
Alternative Flow	Step 6: • If the email entered by the user is not registered into the application, the application notifies the user that the provided email account is not associated with any registered account. Step 7: • If the user has not received any code, they can request for resending the code. Step 11: • If the password entered is not valid, the application asks the user to re-enter the password and confirm the password.
Exception	In case of any application failure or any issues with sending the code to the provided email, the application must stop the process and ask the user to try again later
Frequency of use	Low
Special Requirement	• The reset email contains a clear and secure code for the user to enter the code to reset their password. • The newly entered password must be securely stored
Assumption	The user remembers the account from which they have registered into our application

- **Session Arrangement**

Use Case Id	UC-5
Use Case name	Session arrangement
Actors	Mentor, Students

Description	This use-case describes the process of a student requesting the single session from the mentor and the mentor accepting or rejecting the session after reviewing the request.
Trigger	The student initiates the process of arranging the session with the mentor
Pre-Condition	• The student is logged into the application to initiate the request. • The mentor is logged into the system to review the request.
Post Condition	• A session is successfully arranged between the student and the mentor. • The student and the mentor have received the notification regarding the session status.
Normal Flow	1. The student selects the "Find a mentor" option or the search icon to browse the recommended or available mentors. 2. The application displays the list of the mentors with the "Arrange Session" option. 3. The student clicks on the "Arrange Session" button for a specific mentor. 4. The application directs the student to a new page to request a session from the mentor. 5. The application asks the student to enter the following details: a. Session type (physical or online) b. Available slot with specified time c. Topic for the session 6. The student enters all the required details and send the request to the mentor. 7. The mentor receives the session request and is notified. 8. The mentor opens the "Session Requests" tab. 9. The mentor reviews the request of the student and initiate the conversation with the student using in app messaging 10. The mentor schedules the session by communicating the schedule and venue for the session. 11. If both the student and the mentor agree on a common schedule, the mentor accepts the session request. 12. If the mentor accepts the session request, the application schedules the session and notifies the student displaying all the details of the arranged session.
Alternative Flow	Step 11: • If the session could not be arranged because of any schedule clashes, the mentor rejects the session request. Step 12: • If the mentor rejects the session request, the application notifies the student that the request has been declined

Exception	In case of any failures or crashes in the application during the process, the application must inform the student and the mentor.
Frequency of use	High
Special Requirement	• In app messaging should be reliable and secure • The notification system must be secure and correctly working
Assumption	• The student has not reached the limit of the maximum single sessions. • The student and mentor have active and stable internet connection to send, view and accept request

- **Mentor Recommendation:**

Use Case Id	UC-6
Use Case name	Mentor Recommendation to Students
Actors	Student, Mentor
Description	This use-case describes the process of recommending mentors to the students by aligning student's data with the mentor's data.
Trigger	A student or a mentor register on Brainy Mingles
Pre-Condition	● Brainy Mingles must be installed and working on the user's device ● The student and the mentor must have a valid registration on the Brainy Mingles.
Post Condition	● The mentors are aligned with the students and the list of recommended mentors is updated and displayed to the students.
Normal Flow	1. Student or a mentor register to the Brainy Mingles Application 2. The Brainy Mingles ask the user to enter detailed information including all the details i.e., name, semester, degree, email as well as the details regarding domains, Languages, availability, their preferred mode and session type. 3. The user i.e., the mentor or the student enters the complete details. 4. Brainy Mingles extracts the relevant information from the details entered that are required to make recommendations i.e., domains, Languages, availability, their preferred mode and session type. 5. Brainy Mingles utilizes the matching algorithm, aligns the students and the mentors update the recommendations. 6. Brainy Mingles suggest potential mentors to the students.

Alternative Flow	-
Exception	If the matching algorithm fails to provide recommendations due to network issues or any other faults, the student receives a message.
Frequency of use	High
Special Requirement	The Brainy Mingles should have secure access to the student and mentor database.
Assumption	The recommendation algorithm is working fine and best recommendations are provided to the students.

- **In-app Notifications:**

Use Case Id	UC-7
Use Case name	In-app Notifications
Actors	Student, Mentor, Faculty Member, Admin
Description	This use-case describes the process of timely delivery of notifications to the users within the application.
Trigger	The events such as mentorship request, mentorship session invitation, new messages, or any important announcements will trigger the notifications.
Pre-Condition	• Brainy Mingles must be installed and working on user's device. • The user has enabled the permissions to receive notifications on the device. • The user performs an event that triggers the notification.
Post Condition	• The system detects the triggered event. • The user receives an in-app notification. • The user is informed about the relevant activities and events within 'Brainy Mingles'.
Normal Flow	1. The user logs in into the Brainy Mingles application. 2. The application displays different options to the user based on his role. 3. The users perform their required action. 4. If the user's action triggers the notification, the system detects it. 5. The system utilizes Firebase Cloud Messaging to deliver the notification to the user's device. 6. The user receives the in-app notification.

Exception	Users will have the option to customize their delivering notifications settings based on their preferences.
Frequency of use	High
Special Requirement	• The system treats each user's notification preferences individually, ensuring a more personalized experience.
Assumption	• The user's have enabled the option of notification delivery in the application.

- **Bidding**

Use Case Id	UC-8
Use Case name	Bidding
Actors	Mentor, Students
Description	This use-case describes the process of a student bidding a mentor for a mentorship program by offering the budget.
Trigger	The student initiates the process of bidding with the mentor
Pre-Condition	• The student is logged into the application to initiate the bidding. • The mentor is logged into the system to receive the bidding.
Post Condition	• A mentor accepts the bidding made by the student and agree on a budget student gets mentorship from the mentors.

Normal Flow	1. The student selects the "Find a mentor" option or the search icon to browse the recommended or available mentors.
	2. The application displays the list of the mentors with the "Make a bid" option.
	3. The student clicks on the "Make the bid" button for a specific mentor.
	4. The application directs the student to bidding page
	5. The application asks the student to enter the following details:
	  1. Session type (physical or online)
	  2. Course for the session
	  3. Budget

	6. The student enters all the required details and send the request to the mentor. 7. The mentor receives the bidding request and is notified. 8. The mentor opens the "Bidding request" tab. 9. The mentor reviews the request and either accept or reject the request of the student. 10. The mentor can communicate with students for the discussion of mentorship program through the in app messaging. 11. If both the student and the mentor agree on a common budget, the mentor accepts the session request. 12. If the mentor accepts the bidding request, the application notifies the student displaying all the details of the arranged bidding program.
Alternative Flow	Step 11: • If the mentorship program could not be arranged because of any schedule clashes or uncertain reason, the mentor rejects the session request. Step 12: • If the mentor rejects the session request, the application notifies the student that the request has been declined
Exception	In case of any failures or crashes in the application during the process, the application must inform the student and the mentor.
Frequency of use	High
Special Requirement	• In app messaging should be reliable and secure • The notification system must be secure and correctly working
Assumption	• The student and mentor have active and stable internet connection to send, view and accept request

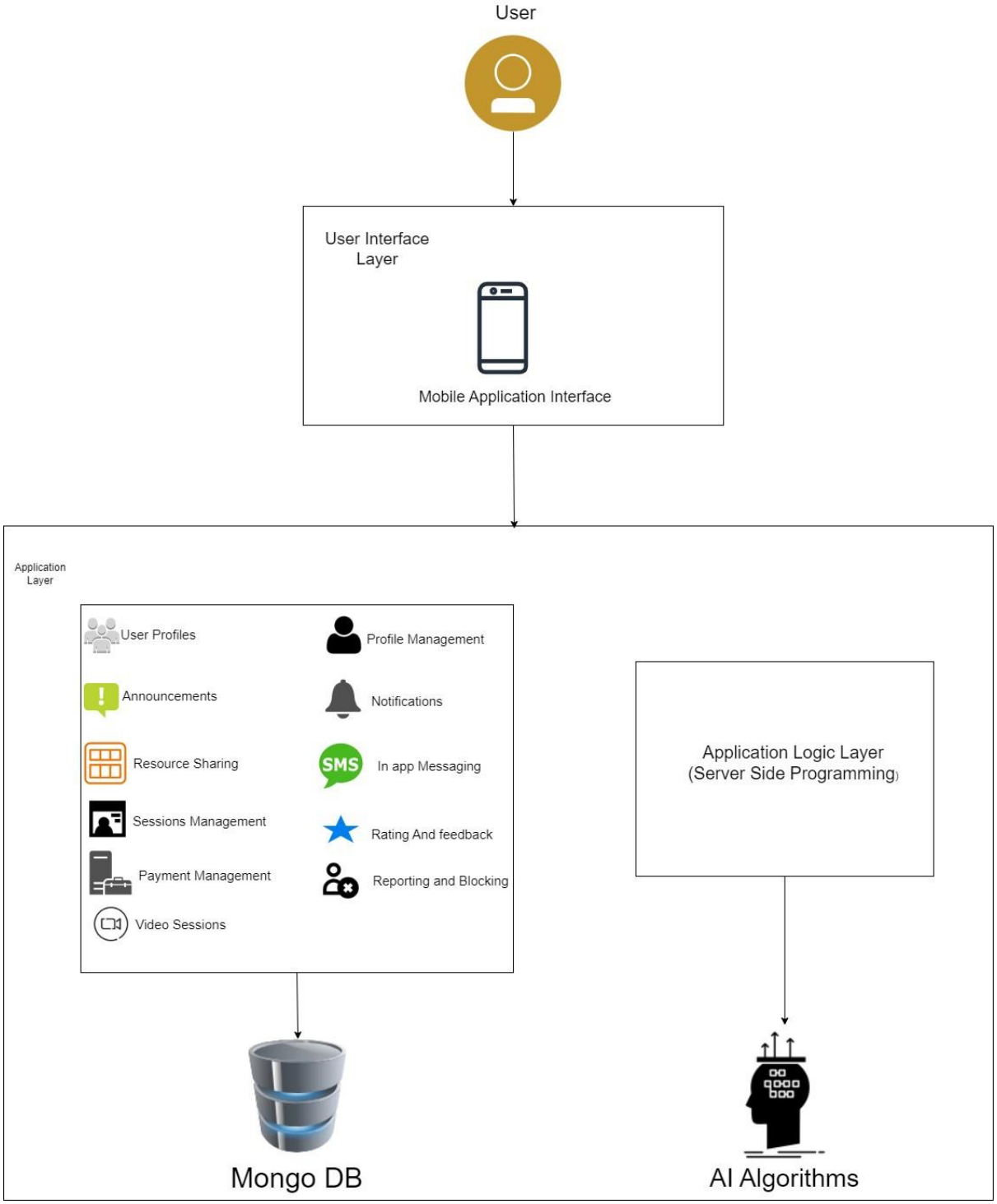
- **Video Call:**

Use Case Id	UC-9
Use Case name	Video Call
Actors	Student, Mentor
Description	This use-case describes the process of initiating and conducting a video call between the student and the mentor within the application.
Trigger	The mentor initiates the video after accepting the session request from the student.

Pre-Condition	• Brainy Mingles must be installed and working on user's device. • The session should be arranged between the student and the mentor.
Post Condition	• The students and mentor can have a video call session.
Normal Flow	1. The student/mentor logs into the application. 2. The student/mentor arranges a session. 3. The mentor creates a conference id and initiates the meeting. 4. The students gets the conference id from database. 5. Student enters the conference id. 6. The video session starts between the students and the mentor.
Exception	In case of any failures or crashes in the video call during , the application must inform the student and the mentor.
Frequency of use	High
Special Requirement	• Both the students and mentors should have a stable internet connection.
Assumption	• The user's have enabled the video call for this profile.

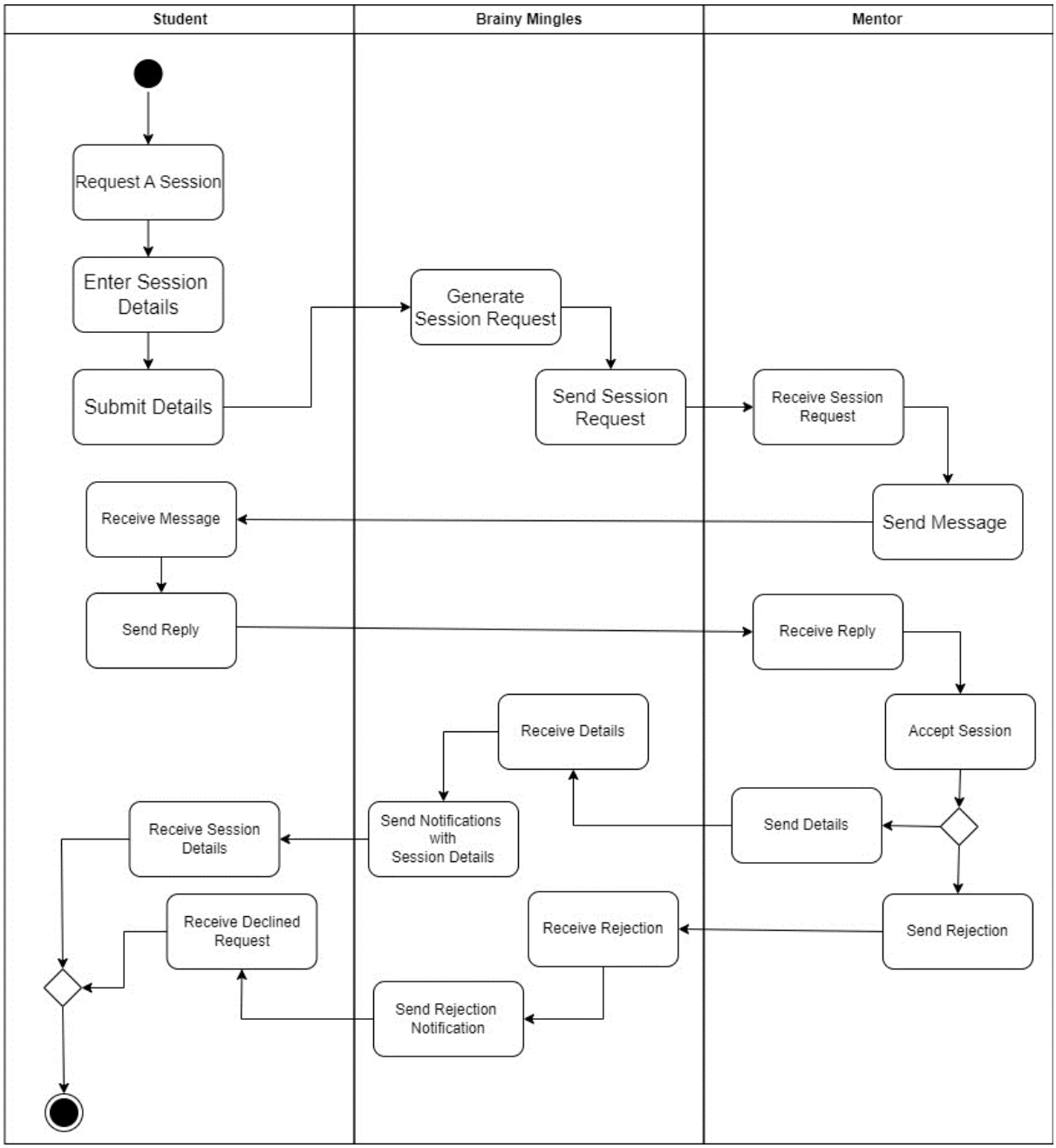
4. Architecture Diagram

Its layered architecture has a presentation layer, application layer and a database layer.

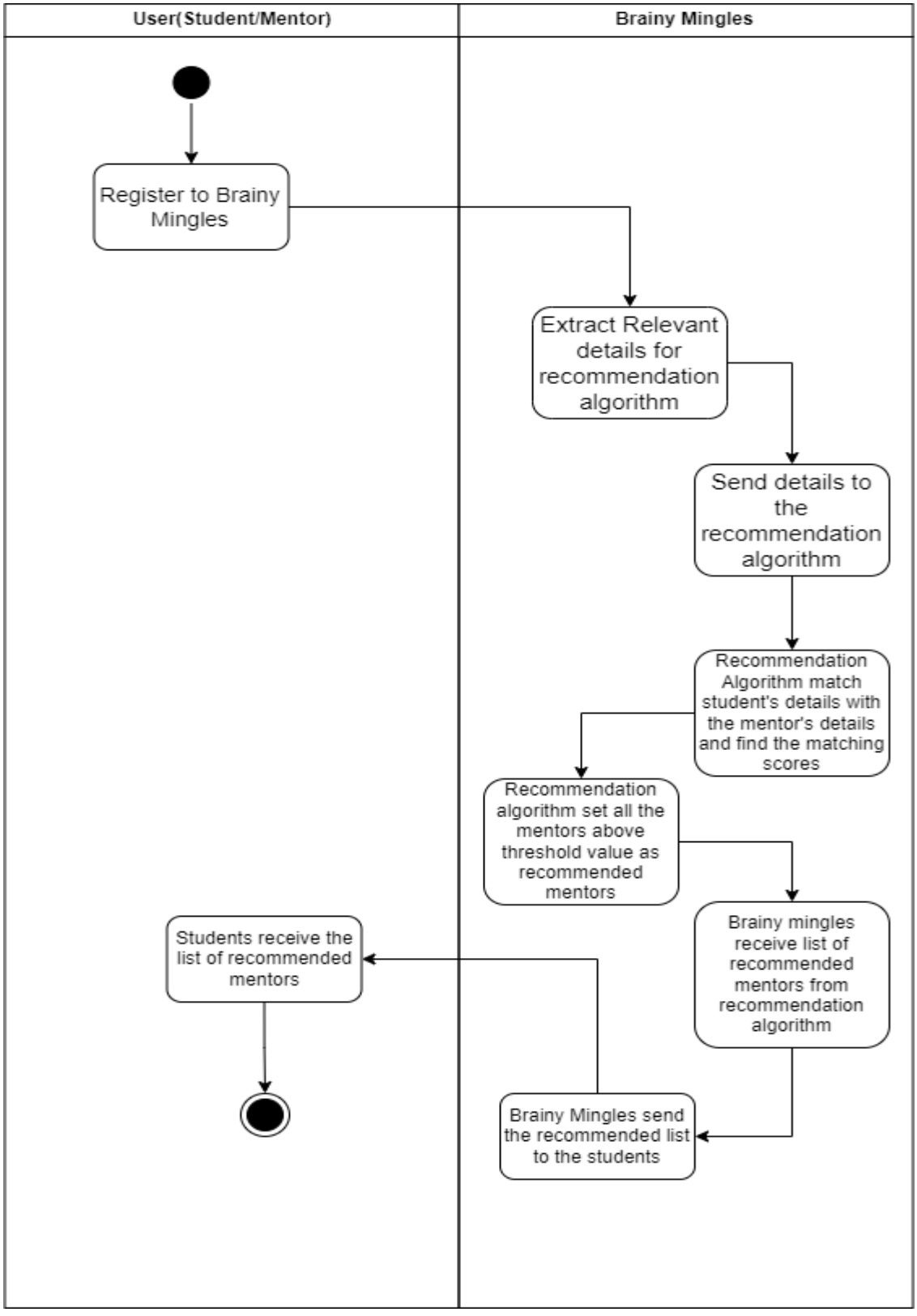


5. Activity Diagram

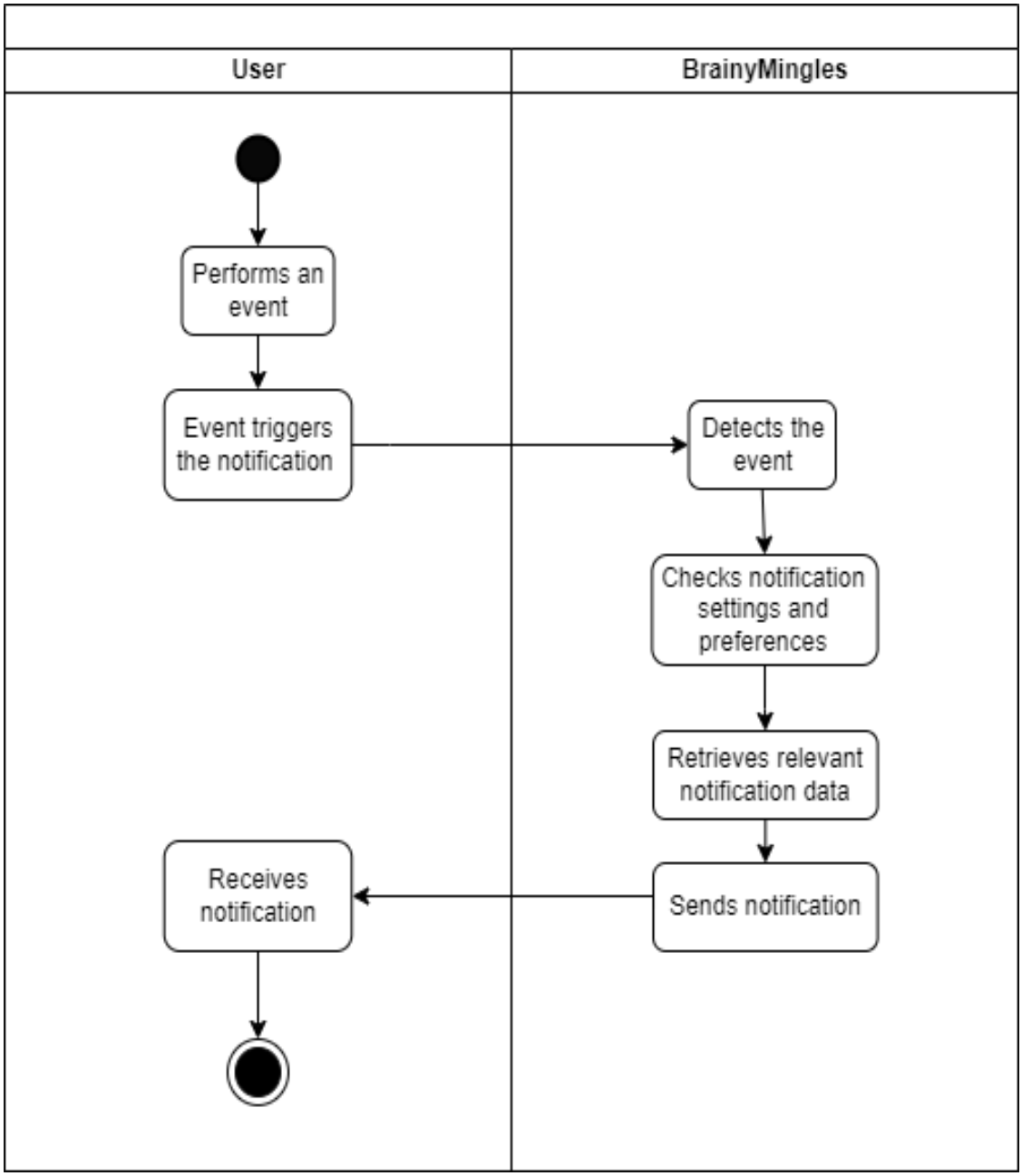
- **Session Arrangement**



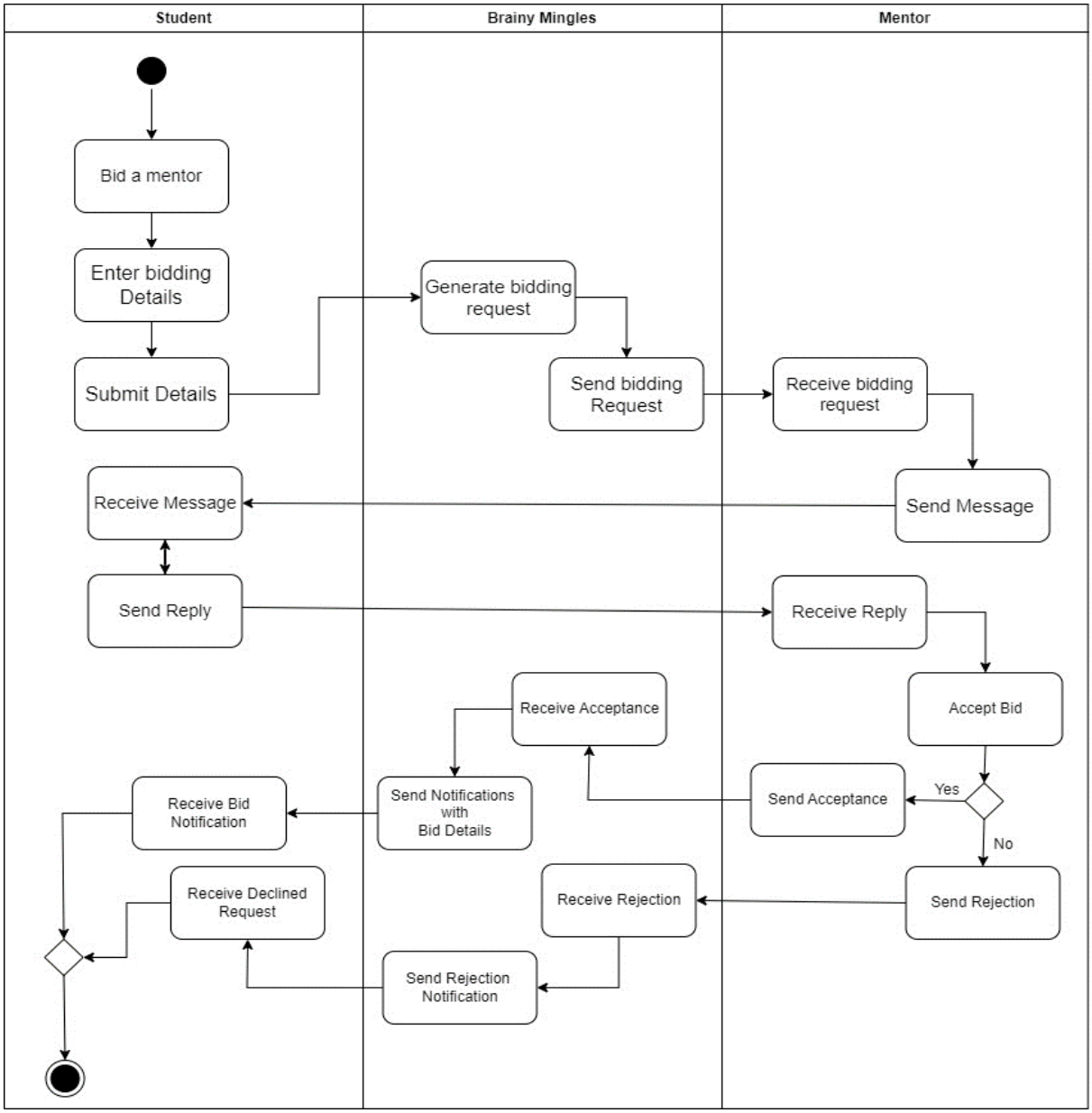
- **Mentor Recommendation**



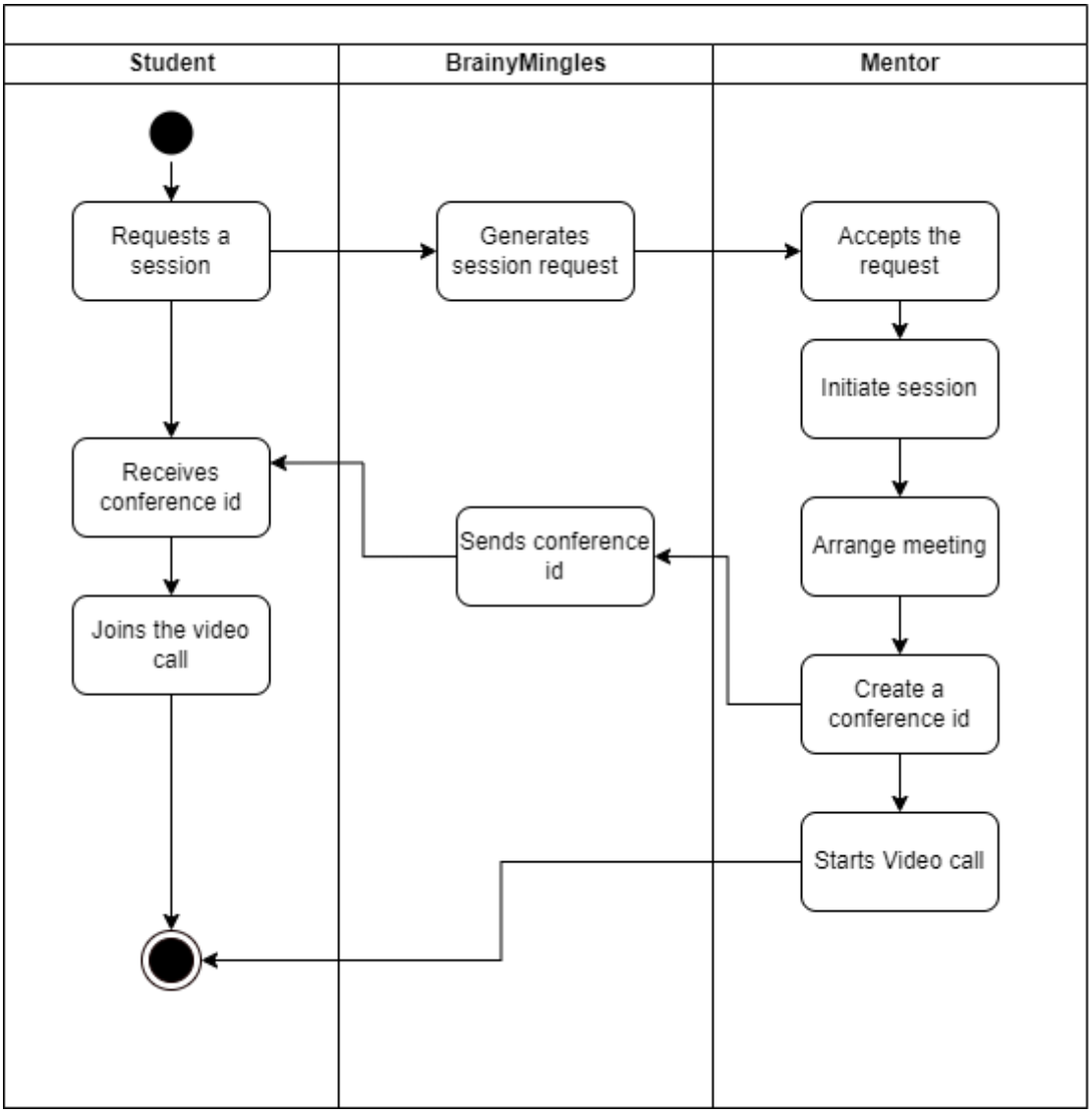
- **Notifications**



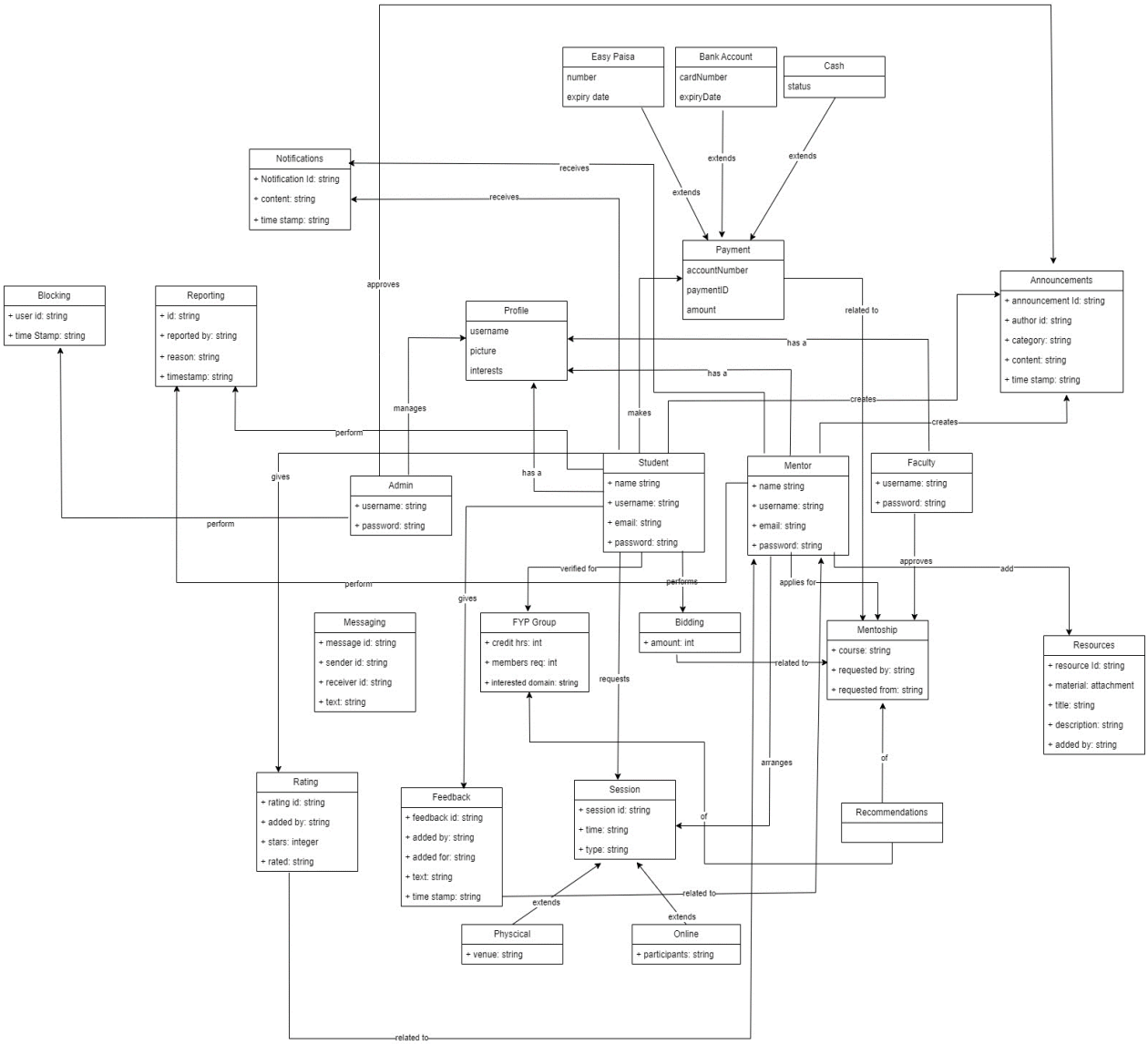
- **Bidding a mentor**



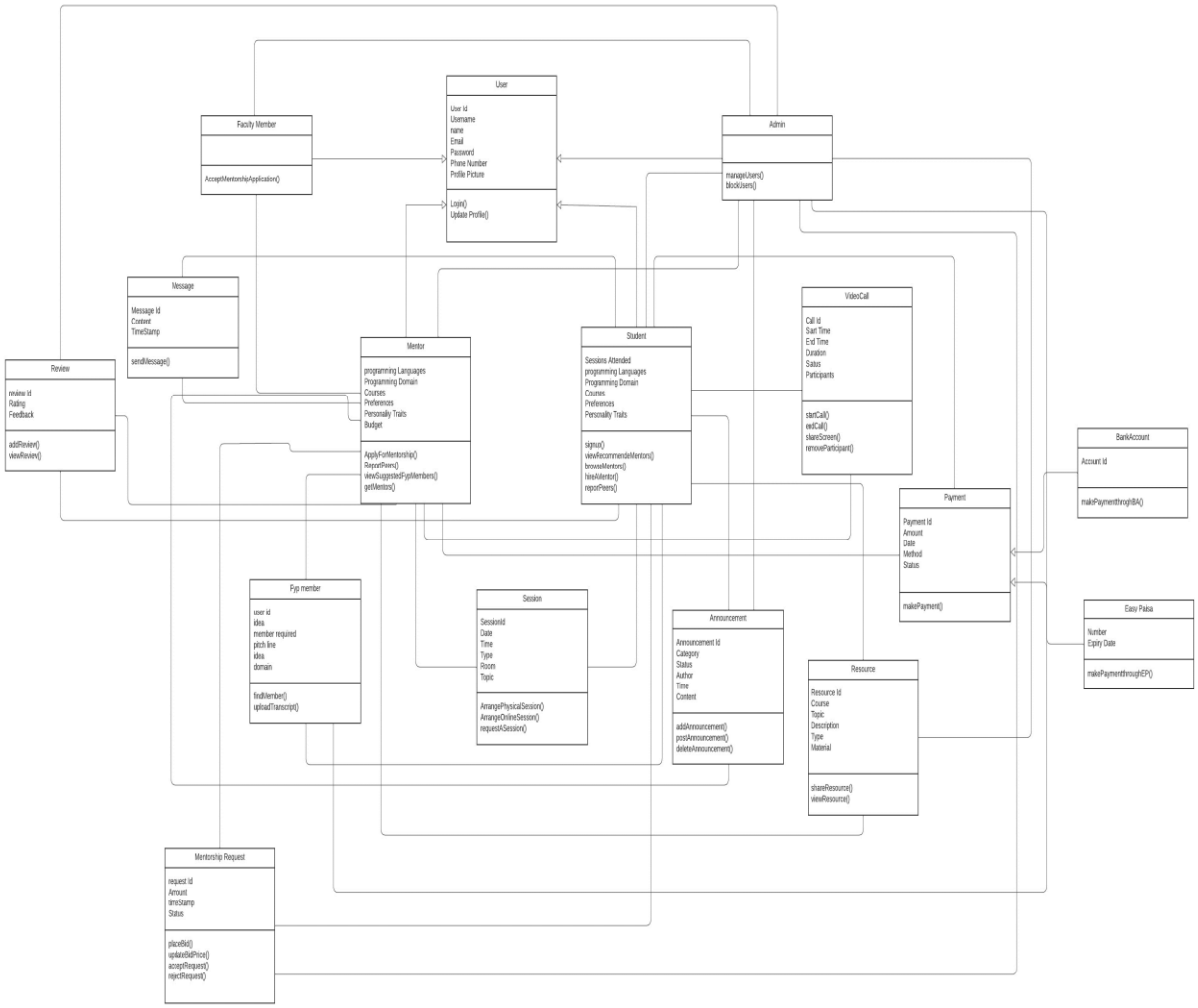
- **Video Call:**


Student
BrainyMingles
Mentor
Requests a session
Generates session request
Accepts the request
Initiate session
Receives conference id
Sends conference id
Arrange meeting
Joins the video call
Create a conference id
Starts Video call

6. Domain Model

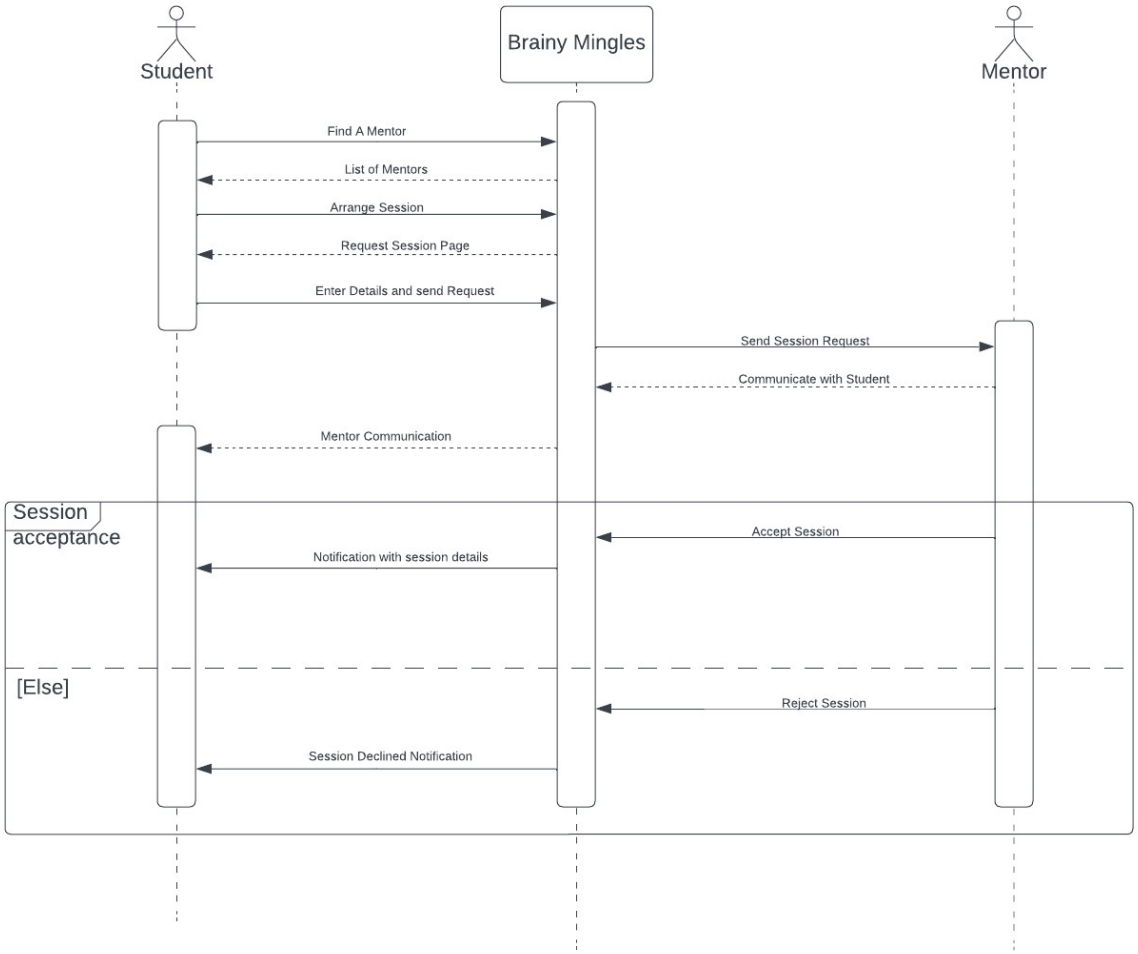


6. Class Diagram

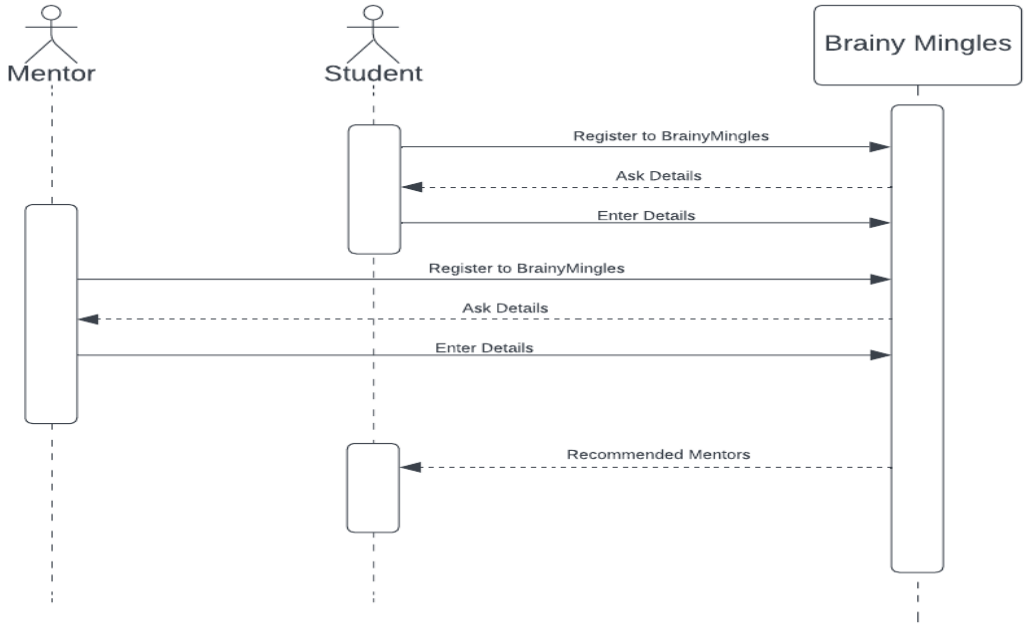


7. System Sequence Diagram

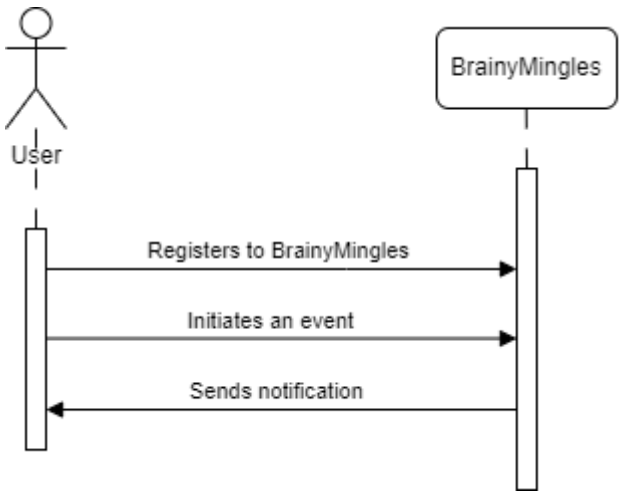
1. Session Arrangement



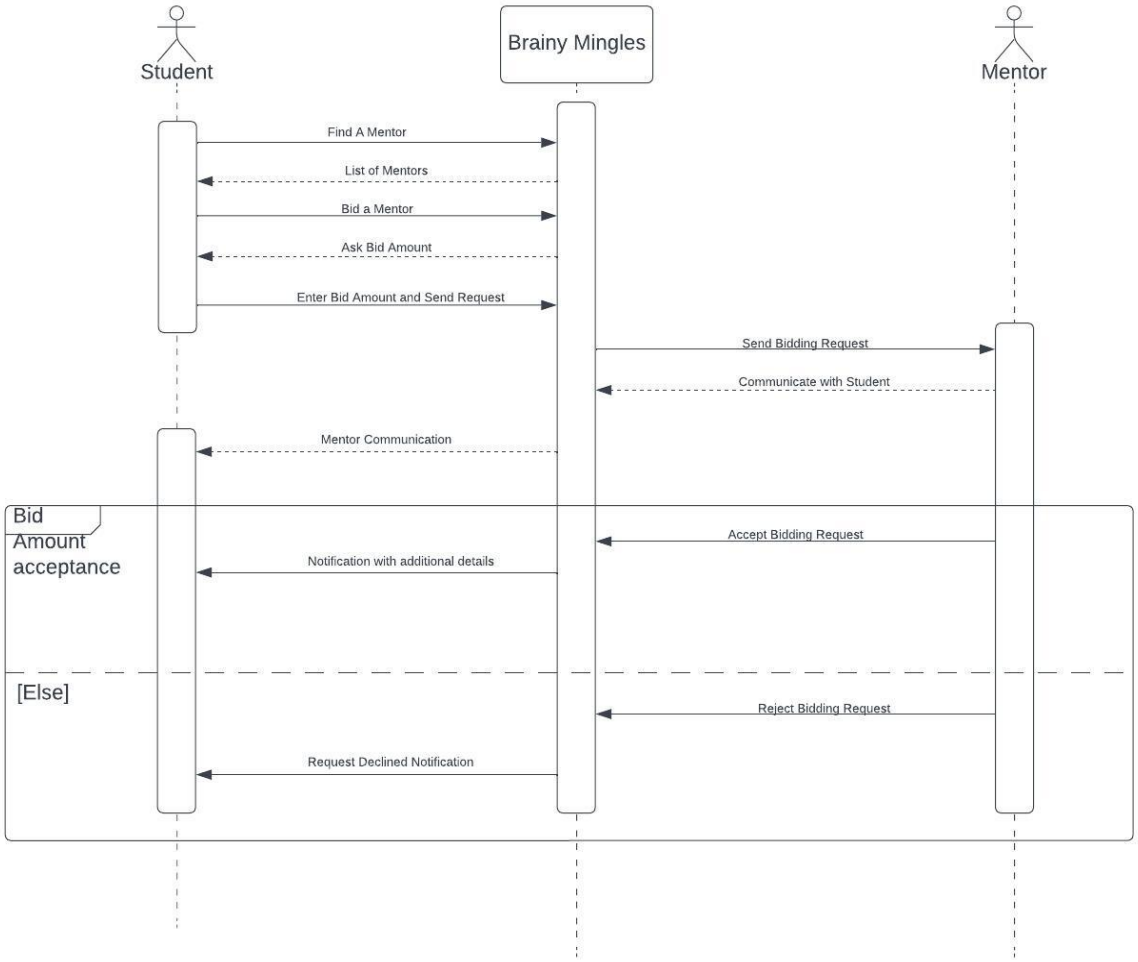
2. Mentor Recommendation



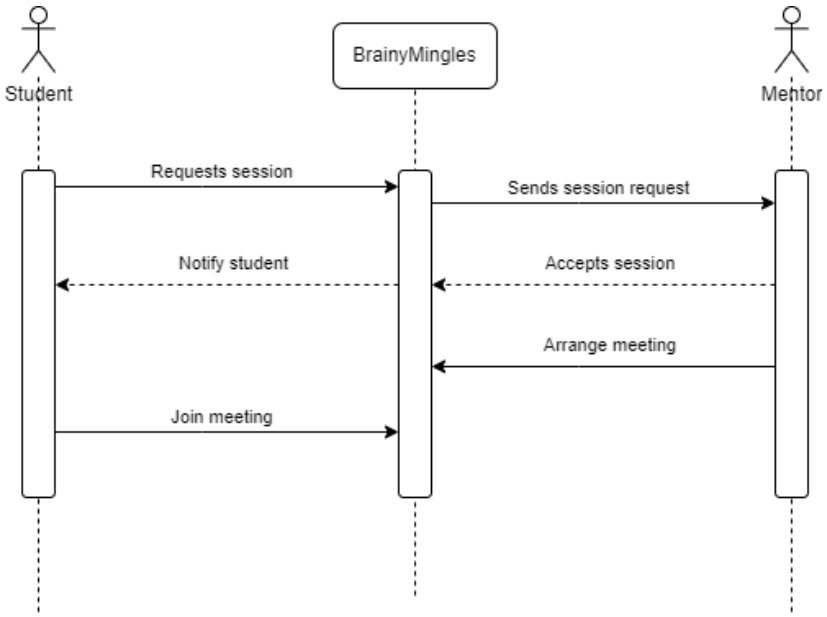
3. Notification



4. Bidding



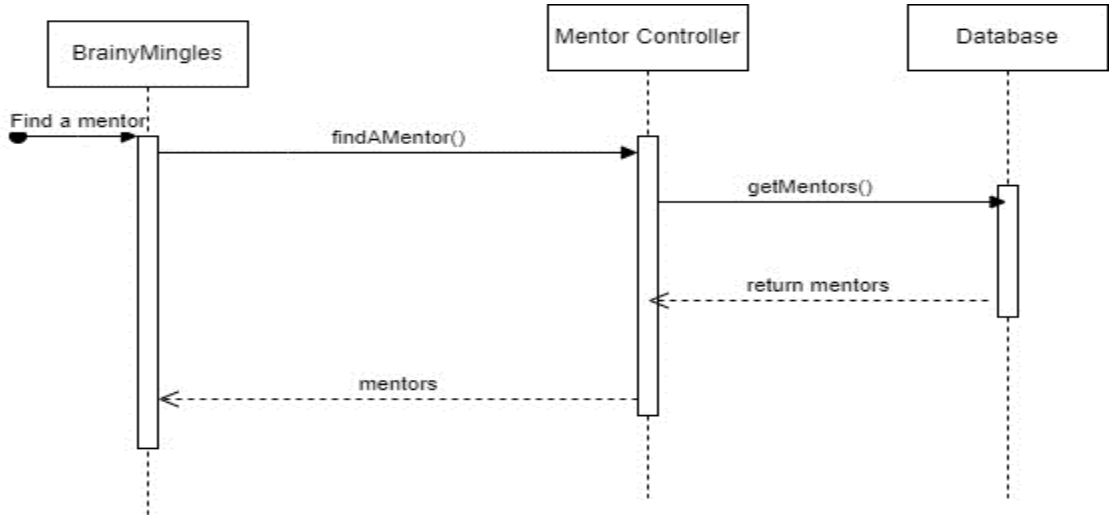
5. Video Call:



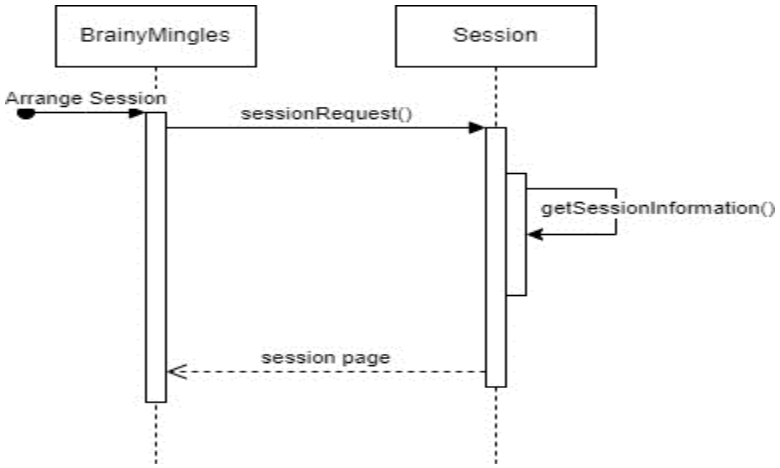
8. Sequence Diagrams

1. Session Arrangement

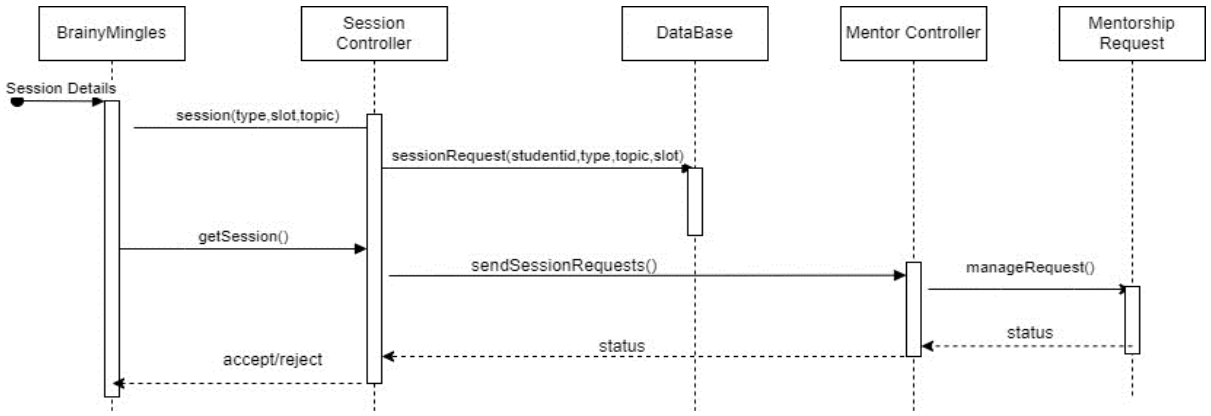
- **Find a Mentor**



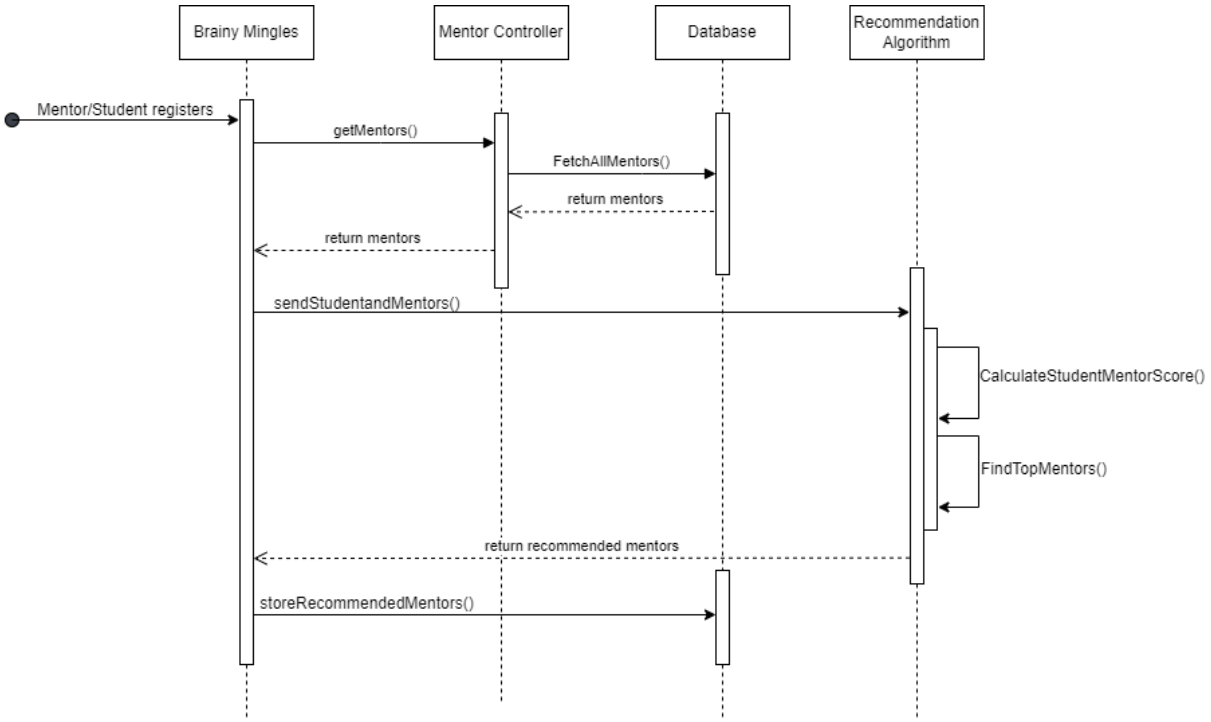
- **Arrange Session**



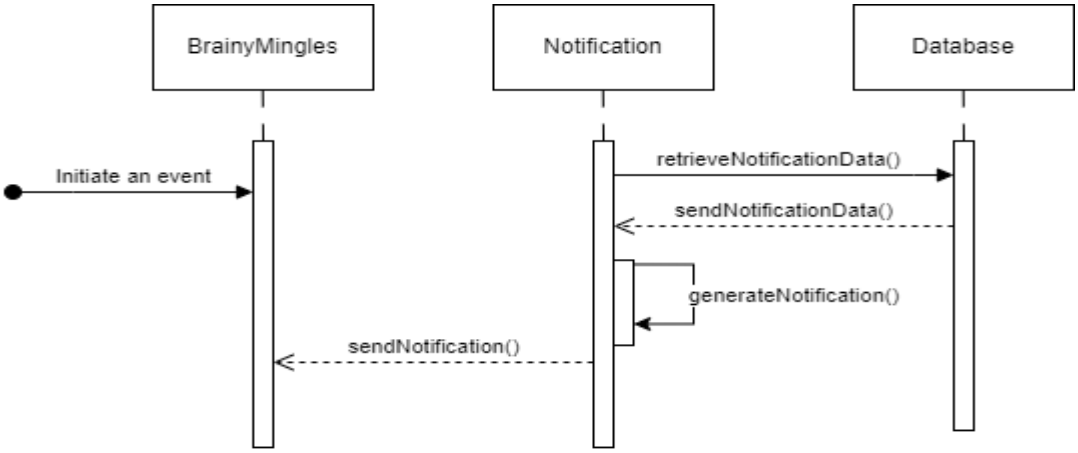
- **Session Request**



2. Mentor Recommendations

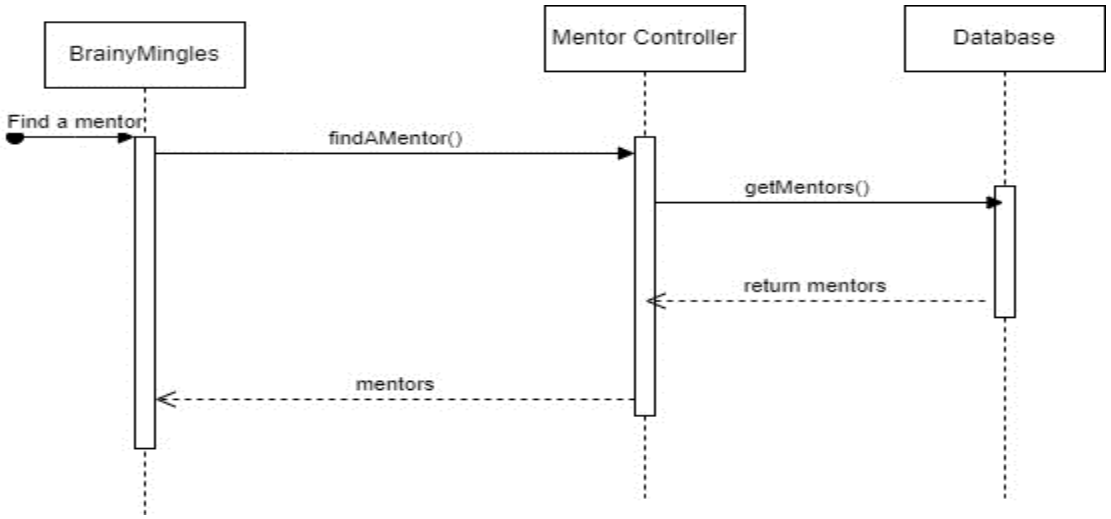


3. Notifications

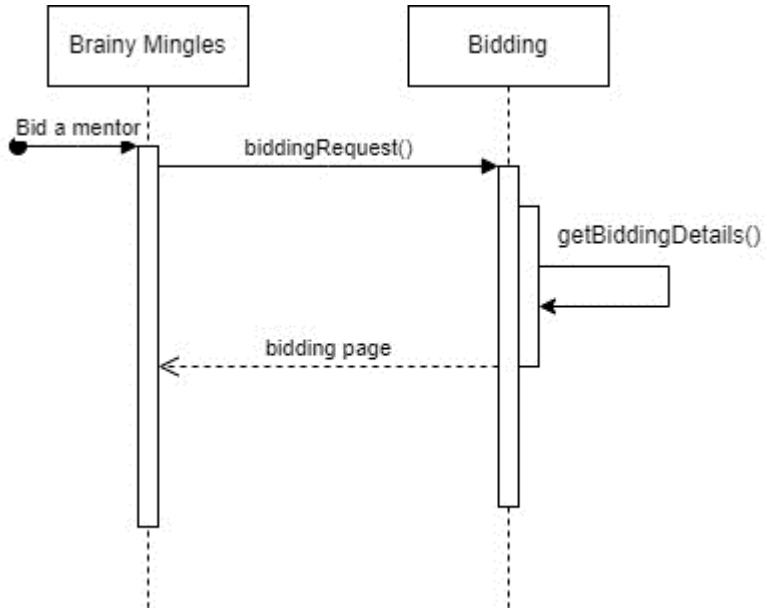


4. Bidding

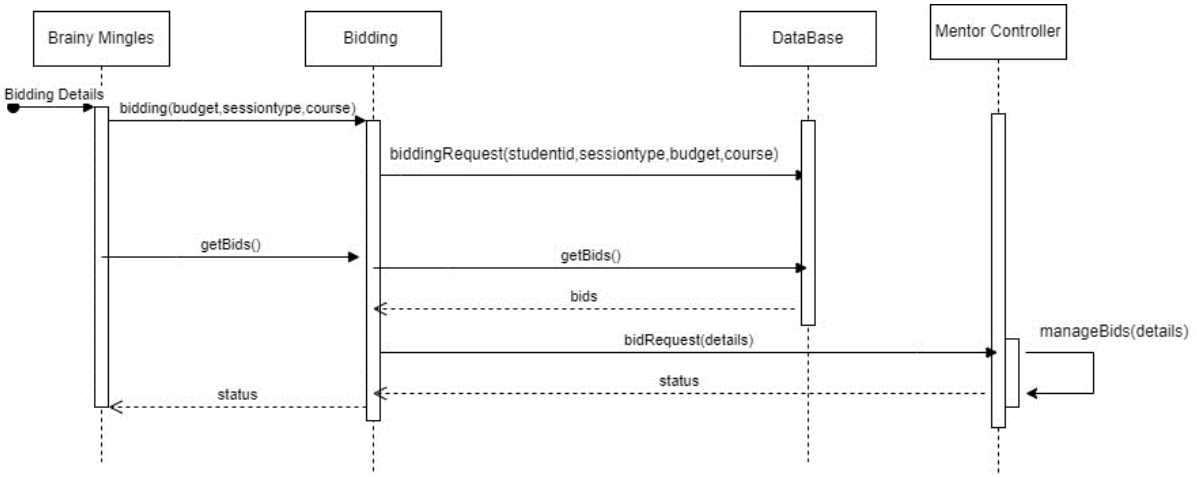
- **Find a Mentor**



- **Bid a mentor**

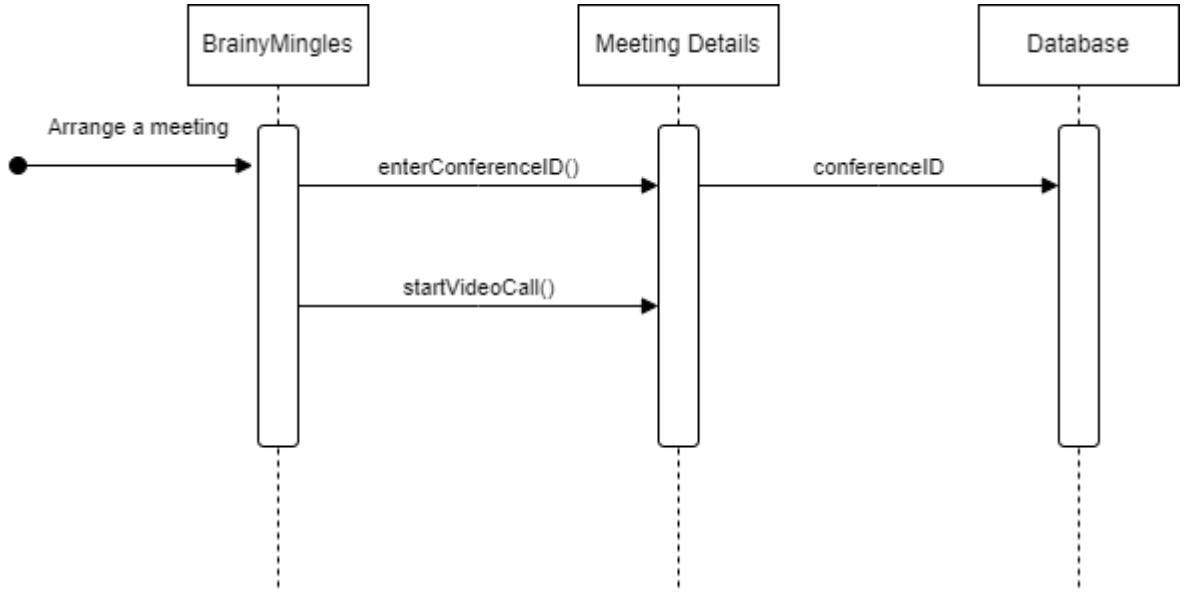


- **Bidding Request**

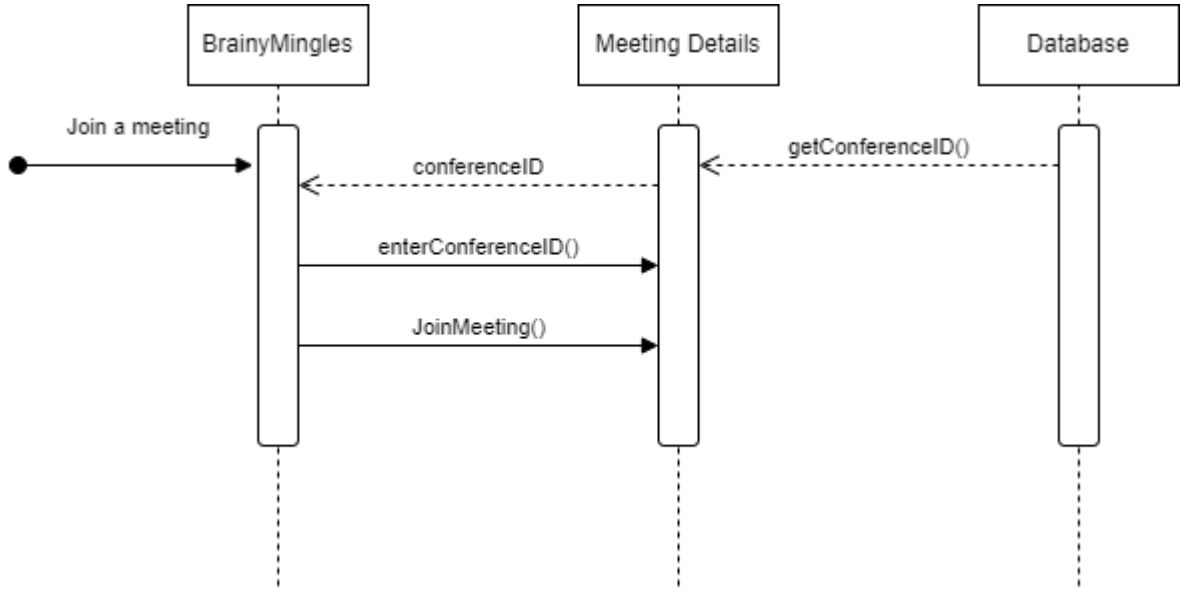


5. Video Call

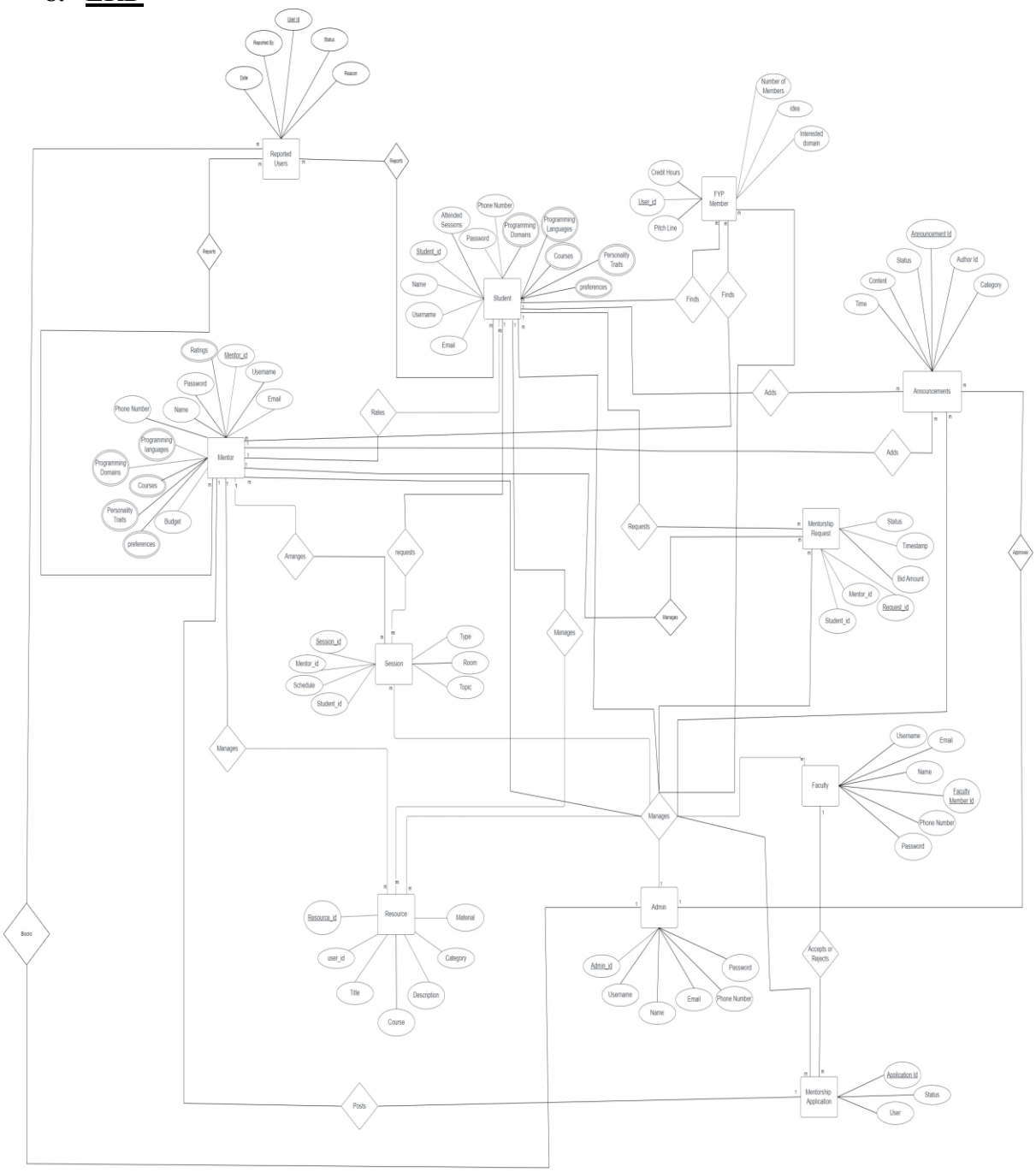
- **Arrange a meeting:**



- **Join a Meeting:**



8. ERD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Reported By
Status
Date
Reason
Reported Users
Reports
Reports
Number of Members
Idea
Interested domain
Credit Hours
User_id
Pitch Line
FYP Member
Finds
Finds
Attended Sessions
Phone Number
Password
Programming Domains
Programming Languages
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Personality Traits
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preferences
Username
Email
Student
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Status
Author Id
Content
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Time
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Adds
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requests
Manages
Session_id
Mentor_id
Schedule
Student_id
Session
Type
Room
Topic
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Email
Name
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Description
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Email
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Phone Number
Accepts or Rejects
Books
Posts
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Status
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