BS in Data Science and Applications

Software Engineering

Milestone 3

(Scheduling and Design)

Topic **Gen AI Integration with Seek portal.**
Team 30
1   Anjali Panchal   21F2000411
2   Sahil Sandhu   21F1002317
3   Abdul Ahad Rauf   21F3002590
4   Sanket Metrewar   21F3000961
5   Aman Verma   21F1006376
6   Neon Thapa   21F1000706
7   Pratham Sharma   21F1006197
8   Leo Tom   21F1005835

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Project Schedule

Sprints Schedule

- **SS Sprint 1:** Brainstorm and Research.
  - **Date:** 10 Jun 2024 – 24 Jun 2024.
- **SS Sprint 2:** Architecture design for integrating GenAI, backend development, frontend development, testing.
  - **Date:** 1 Jul 2024 – 15 Jul 2024.
- **SS Sprint 3:** Architecture design, backend development, frontend development, testing.
  - **Date:** 15 Jul 2024 – 22 Jul 2024.
- **SS Sprint 4:** Architecture design, backend development, frontend development, testing.
  - **Date:** 22 Jul 2024 – 1 Aug 2024.
- **SS Sprint 5:** Integrate GenAI models with existing website, unit testing, integration testing, acceptance testing.
  - **Date:** 1 Aug 2024 – 8 Aug 2024.
- **SS Sprint 6:** Documentation and deployment.
  - **Date:** 8 Aug 2024 – 15 Aug 2024.

Project Scheduling Tools: JIRA

We use JIRA for project management, task tracking, and collaboration. Its user-friendly interface and customizable features make it perfect for agile development. JIRA's flexibility and robust tools ensure efficient workflow and seamless team communication, enhancing our project's productivity and overall success.
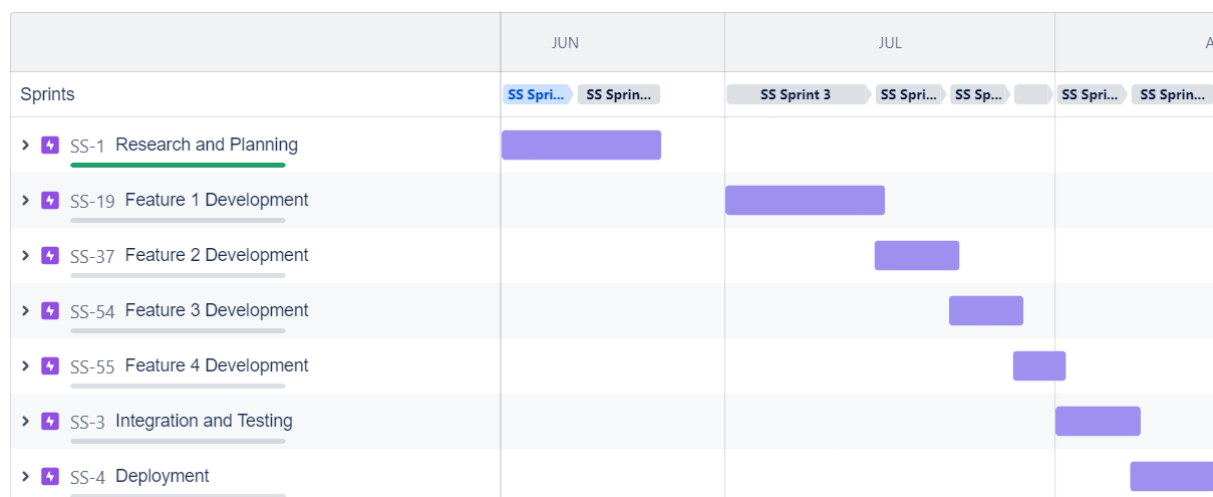
Task Assignment

S. No.	Milestone	Sub-Tasks	Sprint	Assigned To
1	**Identify User Requirements**	Brainstorming & Identify Users	1	All
		User Stories		Abdul
		Learner Journey Map		Anjali
		Report		Sahil
2	**User Interfaces**	Story Board	2	Sahil
		Wireframes		Anjali
		Report		Sahil
3	**Scheduling and Design**	Project Scheduling	3	Anjali & Pratham
		Components Design		Abdul & Neon
		Software Design		Aman
		Minutes of Meetings		Leo
		Report		Sahil
4	**API Endpoints**	API Design	4	Sanket
		API Description		Pratham & Abdul
		YAML File		Sanket
5	**Testing**	Test Case Design	5	Pratham, Abdul & Anjali
		Unit Testing		Aman, Neon & Leo
		Report		Sahil
6	**Final Submission**	Frontend Design	6	Sahil & Anjali
		Backend Implementation		Abdul, Aman & Pratham
		Report		Sahil
		Presentation		All

Design of Components

Backend components

To effectively integrate Generative AI into the SEEK our team discussed the necessary backend components that we will require for smooth functioning:

1. **User Component**
   o The User Component manages user authentication and stores user information, including attributes such as userId, name, and email. It provides methods for users to log in and access their profiles.
2. **Course Component**
   o The Course Component handles course details and content management. It includes attributes such as courseId, course Name, description, and content, and provides methods for viewing course content.
3. **Video Component**
   o The Video Component manages video playback and controls for course materials. It includes attributes like title and URL, and methods to play, pause, and resume videos.
4. **Feedback Component**
   o The Feedback Component provides immediate feedback on quiz answers through the method generate Feedback, which takes a student's answer and returns a string with the feedback.
5. **Summary Component**
   o The Summary Component generates concise summaries of learning materials using the method generate Summary, which takes the content as input and returns a summary.
6. **LinkFetcher Component**
   o The Link Fetcher Component retrieves relevant links for additional resources. It includes the method fetchLinks, which takes content as input and returns a list of links.
7. **SyntheticDataGenerator Component**
   o The SyntheticDataGenerator Component creates synthetic data sets for practice exercises in data science courses. It uses the method generateData, which takes parameters and returns a DataFrame.
8. **Code Compiler Component**
   o The Code Compiler Component compiles and executes code, providing a real-time coding environment. It includes methods such as compileCode to compile code and runCode to execute compiled code with given input, returning the execution result.
9. **Chatbot Component**
   o The Chatbot Component interacts with students to provide instant help and resolve queries. It includes the method, which takes a query as input and returns a response.

Frontend Components

The frontend of the Seek Portal with integrated GenAI features consists of a user interface designed to enhance the learning experience. Here's an overview of the key components:

1. **Main Content Screen with Chatbot Sidebar:**

   - Users can access course content while interacting with an AI-powered chatbot sidebar. This sidebar offers a comprehensive set of features, allowing students to choose from various AI functionalities and input personalized prompts.

2. **Summarize Screen:**

   - Users can generate quick summaries of long lectures or course materials. The system provides concise overviews of key points, aiding in revision and comprehension.

3. **Feedback Screen:**

   - Users receive tailored feedback on their assignments, with explanations for incorrect answers. This feature helps identify areas for improvement and enhances the learning process.

4. **Synthetic Data Screen:**

   - Users can generate artificial datasets for practicing with models and algorithms. This feature allows for hands-on experience with varied data, enhancing understanding of data analysis concepts.

5. **External Resources Screen:**

   - Users can access a curated list of external resources including articles, online courses, and video tutorials related to their current topics of study. This feature broadens the learning scope beyond course materials.

Software Design

The UML class diagram offers a visual overview of the nine components and their interconnections within the Super Seek project. It depicts the system's structure, highlighting the various user types—students, support staff, admins, and IT staff—as well as the primary entity, GenAI. Additionally, it showcases the interactions between these components, including summary generation, link fetching, and feedback generation. This class diagram serves as a blueprint for the system architecture, facilitating the understanding and communication of the Super Seek system's design.

Components
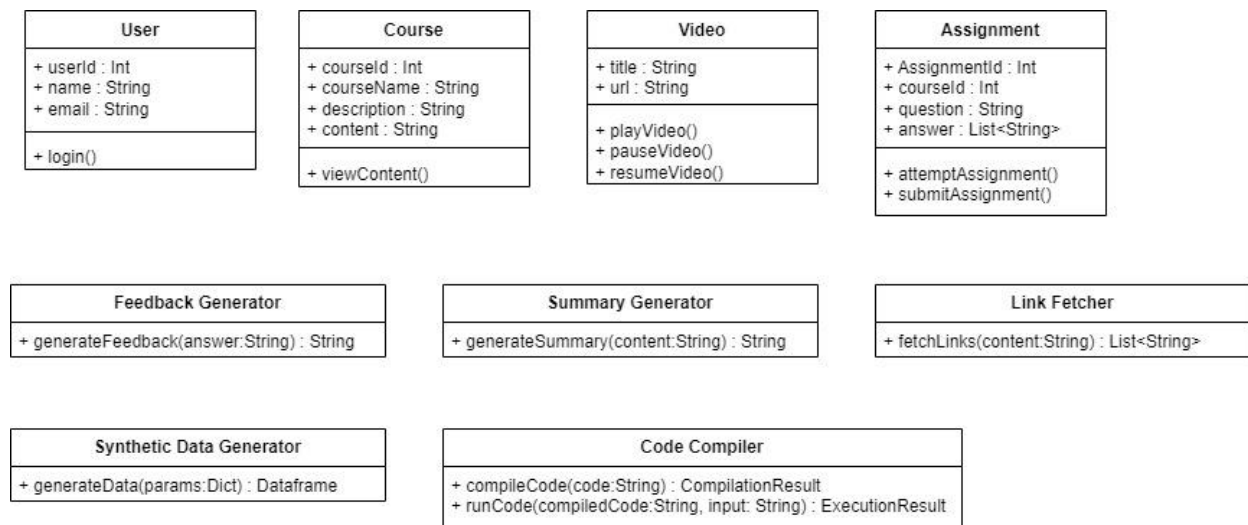
Course Usage
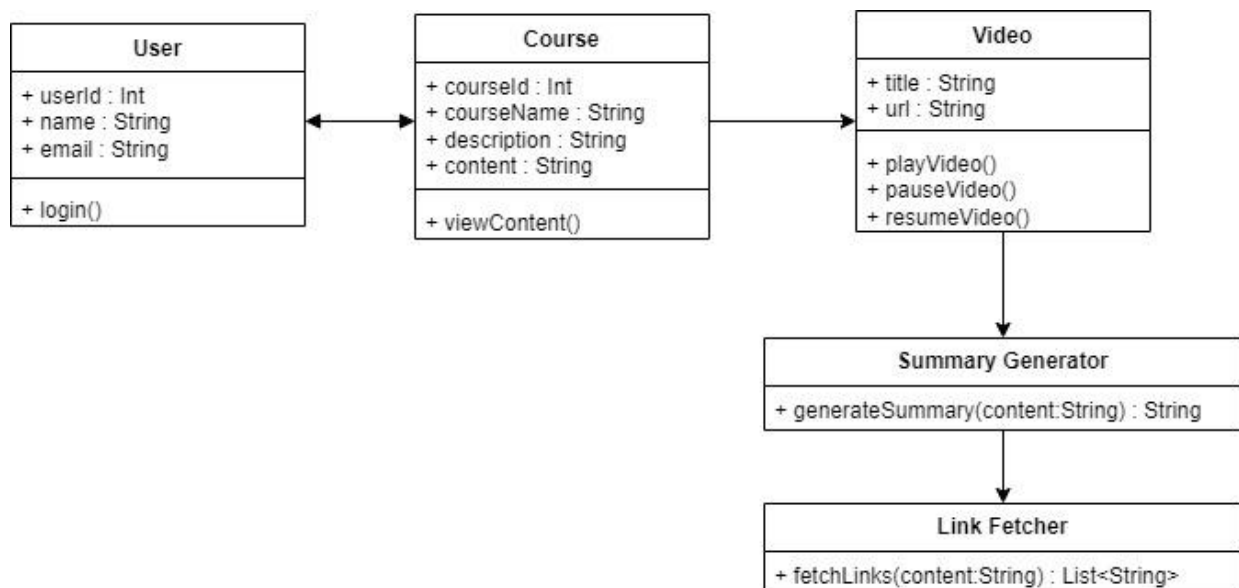
Assignment Usage

Final Compilation
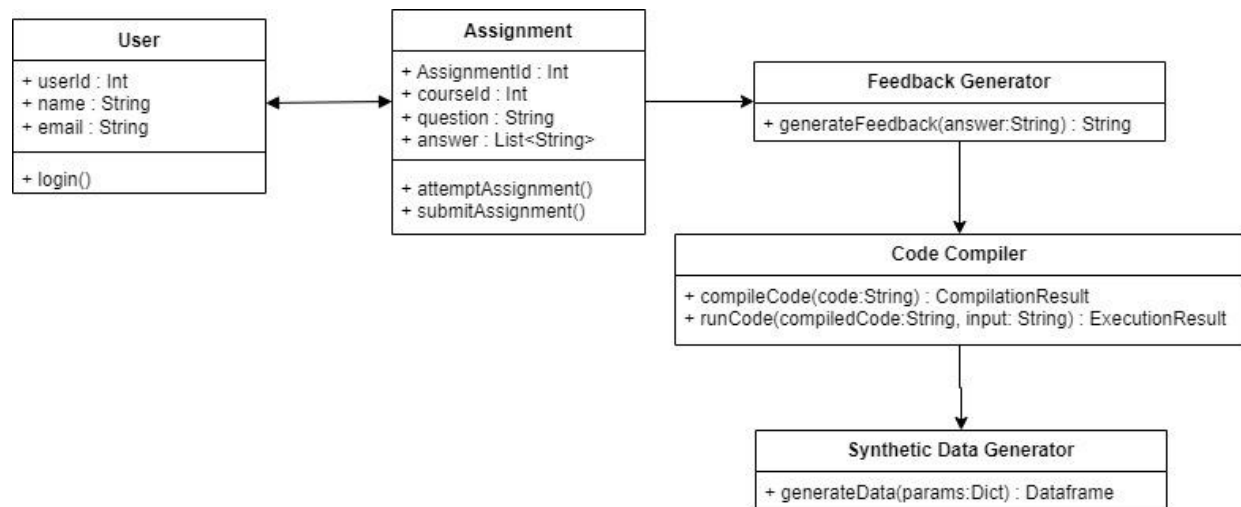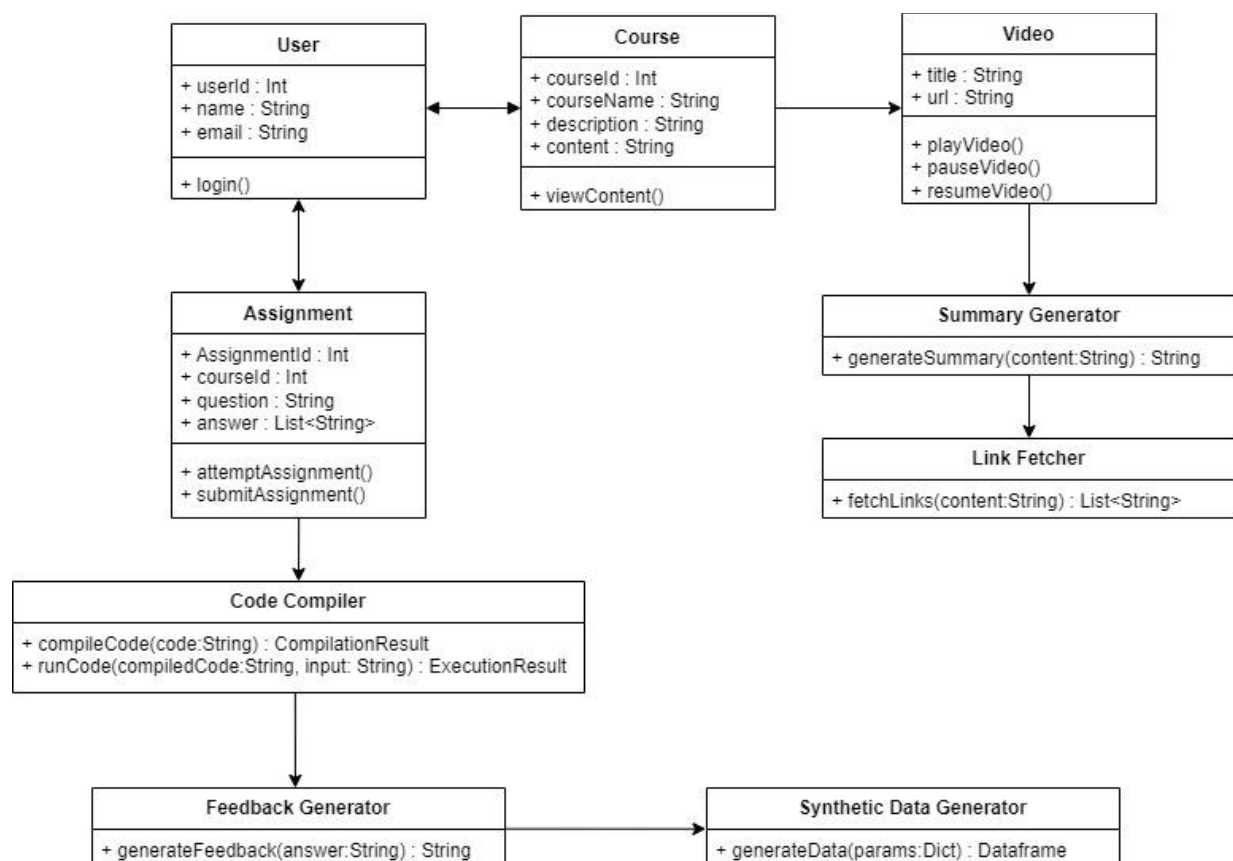
Details/Minutes of scrum meetings

Sprint 1 (Intro and Ice Breaking)

Date   Jun 10Th 2024
Time   7:00 p.m.
Meeting called to order by   Anjali Panchal

- **In Attendance:**

	A	B	C	D	E	F
	First name	**Last name**	**Email**	**Duration**	**Time joined**	**Time exited**
	ANJALI	PANCHAL	21f2000411@ds.study.iitm.ac.in	39 min	7:04 PM	7:43 PM
	Abdul Ahad	Rauf	21f3002590@ds.study.iitm.ac.in	26 min	7:17 PM	7:43 PM
	SAHIL	SANDHU	21f1002317@ds.study.iitm.ac.in	36 min	7:07 PM	7:43 PM
	SANKET	SATISH METREWAR	21f3000961@ds.study.iitm.ac.in	34 min	7:09 PM	7:43 PM
	PRATHAM	SHARMA	21f1006197@ds.study.iitm.ac.in	35 min	7:07 PM	7:43 PM
	Leo	Tom	leot******@***.com	34 min	7:08 PM	7:43 PM
	AMAN	VERMA	21f1006376@ds.study.iitm.ac.in	36 min	7:07 PM	7:43 PM

- **Team:**
  - Each member introduced themselves, providing a brief background including their name, major/department, interests, and any previous project experience.
  - Anjali Panchal was nominated to be the team leader

- **Setting up communication channels:**
  - Agreed on using WhatsApp for regular communication and to use G-Meets for regular team meetings

- **Scheduling regular meetings:**
  - Regular meetings are scheduled on G-Meet and the next meeting will be decided during each meeting
  - Any immediate meeting will be called through the WhatsApp group
  - Agreed to review and adjust the schedule, if necessary, based on members' availability.

- **Next meeting:**
  - https://meet.google.com/rxb-hbuw-wpi
  - Jun 21st 2024

Sprint 2 (Brainstorming the project)

Date   Jun 21st 2024
Time   8:30 p.m.
Meeting called to order by   Anjali Panchal

- **In Attendance:**

	A	B	C	D	E	F
	First name	**Last name**	**Email**	**Duration**	**Time joined**	**Time exited**
	ANJALI	PANCHAL	21f2000411@ds.study.iitm.ac.in	1 hr 2 min	8:26 PM	9:29 PM
	Abdul Ahad	Rauf	21f3002590@ds.study.iitm.ac.in	59 min	8:29 PM	9:29 PM
	SAHIL	SANDHU	21f1002317@ds.study.iitm.ac.in	1 hr 4 min	8:25 PM	9:29 PM
	SANKET	SATISH METREWAR	21f3000961@ds.study.iitm.ac.in	53 min	8:30 PM	9:23 PM
	Neon	Thapa	neon*****@***.com	42 min	8:47 PM	9:29 PM
	Leo	Tom	leot******@***.com	52 min	8:36 PM	9:29 PM
	AMAN	VERMA	21f1006376@ds.study.iitm.ac.in	58 min	8:31 PM	9:29 PM

- **Approval of minutes:**
    - The minutes from the previous meeting were read and approved
- **Project:**
    - A list of ideas that could be implemented were drawn and members discussed the feasibility of each idea. Approval of features to be implemented will be taken up in the next meeting.

- **Sub teams:**
    - Team members shared their strengths and it was decided there would be sub-teams focusing on backend, frontend and documentation.
    - Members all chose roles they could contribute to (Scrum Master, Tester, Developer etc.)

- **Tasks:**
    - Members were informed to fill and upload the honor code for milestone 1

- **Next meeting:**
    - https://meet.google.com/rxb-hbuw-wpi
    - Jun 24th 2024

Sprint 3 (Finalising the user requirements)

Date   Jun 24th 2024
Time   6:30 p.m.
Meeting called to order by   Anjali Panchal

- **In Attendance:**

	A	B	C	D	E	F
	First name	**Last name**	**Email**	**Duration**	**Time joined**	**Time exited**
	ANJALI	PANCHAL	21f2000411@ds.study.iitm.ac.in	1 hr 8 min	6:28 PM	7:36 PM
	Abdul Ahad	Rauf	21f3002590@ds.study.iitm.ac.in	1 hr 5 min	6:31 PM	7:36 PM
	SAHIL	SANDHU	21f1002317@ds.study.iitm.ac.in	39 min	6:27 PM	7:07 PM
	SANKET	SATISH METREWAR	21f3000961@ds.study.iitm.ac.in	1 hr 7 min	6:29 PM	7:36 PM
	PRATHAM	SHARMA	21f1006197@ds.study.iitm.ac.in	1 hr 8 min	6:28 PM	7:36 PM
	Leo	Tom	leot******@***.com	47 min	6:44 PM	7:30 PM
	AMAN	VERMA	21f1006376@ds.study.iitm.ac.in	1 hr 8 min	6:28 PM	7:36 PM

- **Approval of minutes:**
    - The minutes from the previous meeting were read and approved
- **Project:**
    - The feasibility of seven ideas were discussed and the it was decided to proceed with three of them
        - Summary Generation
        - Getting Answer Feedback
        - Synthetic Data Generation
    - Story Board and User Stories will be created by respective teams for Milestone 2 based on above features
- **GitHub and drive:**
    - GitHub repository and Drive folder will be created to organize and store project artefacts and shared
    - Members are to upload Honor Code, User Stories and Story Boards
    - Jira will be used to track task completion
- **Next meeting:**
    - https://meet.google.com/rxb-hbuw-wpi
    - Jul 2nd 2024

Sprint 4 (Discussion & division of further task)

Date   Jul 2nd 2024
Time   7:00 p.m.
Meeting called to order by   Anjali Panchal

- **In Attendance**:

	A	B	C	D	E	F
	First name	**Last name**	**Email**	**Duration**	**Time joined**	**Time exited**
	ANJALI	PANCHAL	21f2000411@ds.study.iitm.ac.in	49 min	6:54 PM	7:42 PM
	Abdul Ahad	Rauf	21f3002590@ds.study.iitm.ac.in	42 min	7:00 PM	7:42 PM
	SAHIL	SANDHU	21f1002317@ds.study.iitm.ac.in	38 min	7:04 PM	7:42 PM
	SANKET	SATISH METREWAR	21f3000961@ds.study.iitm.ac.in	42 min	7:00 PM	7:42 PM
	PRATHAM	SHARMA	21f1006197@ds.study.iitm.ac.in	48 min	6:54 PM	7:42 PM
	Neon	Thapa	21f1000706@ds.study.iitm.ac.in	37 min	7:05 PM	7:42 PM
	Leo	Tom	leot******@***.com	28 min	7:09 PM	7:42 PM
	AMAN	VERMA	21f1006376@ds.study.iitm.ac.in	46 min	6:56 PM	7:42 PM

- **Approval of minutes**:
    - The minutes from the previous meeting were read and approved.
- **Project**:
    - Anjali and Pratham were assigned with tracking and scheduling the project sprints.
    - Abdul and Neon were assigned with component design.
    - Sanket works on API design.
    - Sahil is tasked with creating the report.
- **JIRA:**
    - The JIRA project ownership will be transferred to Anjali for smoother tracking of issues and user stories
- **Next meeting:**
    - https://meet.google.com/rxb-hbuw-wpi

Sprint 5 (Current progress and Milestone 3 discussion)

Date   Jul 9th 2024
Time   11:00 p.m.
Meeting called to order by   Anjali Panchal

- **In Attendance:**

	A	B	C	D	E	F
	First name	**Last name**	**Email**	**Duration**	**Time joined**	**Time exited**
	ANJALI	PANCHAL	21f2000411@ds.study.iitm.ac.in	52 min	10:52 PM	11:44 PM
	Abdul Ahad	Rauf	21f3002590@ds.study.iitm.ac.in	44 min	11:01 PM	11:44 PM
	SAHIL	SANDHU	21f1002317@ds.study.iitm.ac.in	54 min	10:50 PM	11:44 PM
	SANKET	SATISH METREWAR	21f3000961@ds.study.iitm.ac.in	40 min	11:04 PM	11:44 PM
	PRATHAM	SHARMA	21f1006197@ds.study.iitm.ac.in	42 min	11:02 PM	11:44 PM
	Neon	Thapa	21f1000706@ds.study.iitm.ac.in	47 min	10:58 PM	11:44 PM
	Leo	Tom	leot******@***.com	39 min	11:05 PM	11:44 PM

- **Approval of minutes:**
    - The minutes from the previous meetings were read and approved.
- **Project:**
    - Everyone discussed their assigned task and current progress.
    - Milestone 3 tentative document discussed along with suggestions from everyone.
- **Next meeting:**
    - https://meet.google.com/rxb-hbuw-wpi