Readify - Intelligent Assistant to Improve Reading and Comprehension Skills in English Language

Project ID: 24-25J-27

LOG BOOK

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DECLARATION

I declare that this is my own work and this Logbook does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other university or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

Name	Student ID	Signature
Ranaweera A.P.	IT21182396	

Signature of the Supervisor   Date
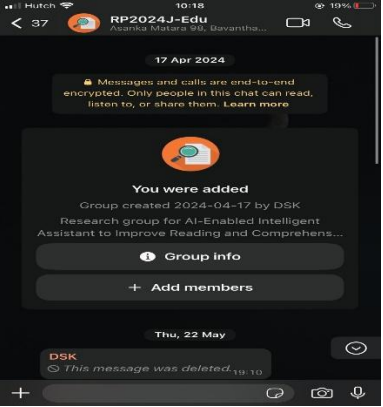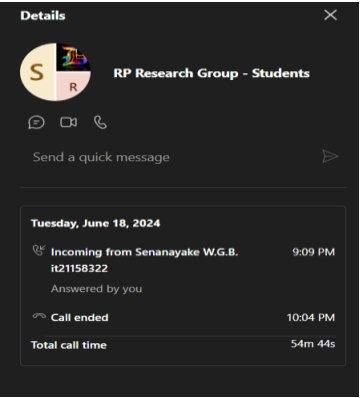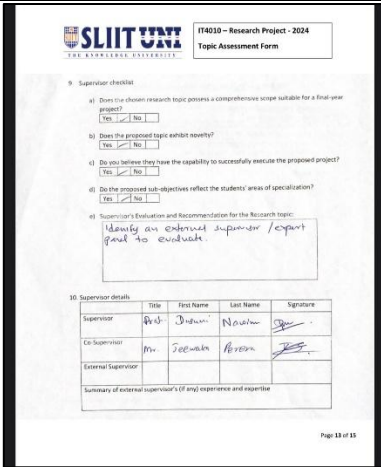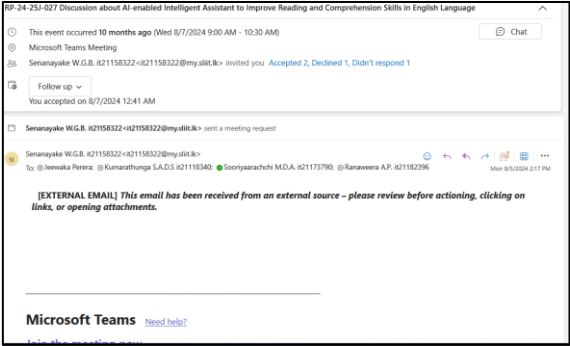 (Dr. Dasuni Nawinna)

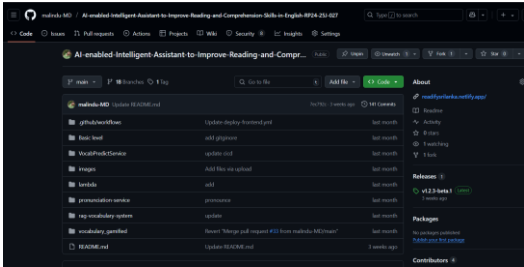..................................   ....
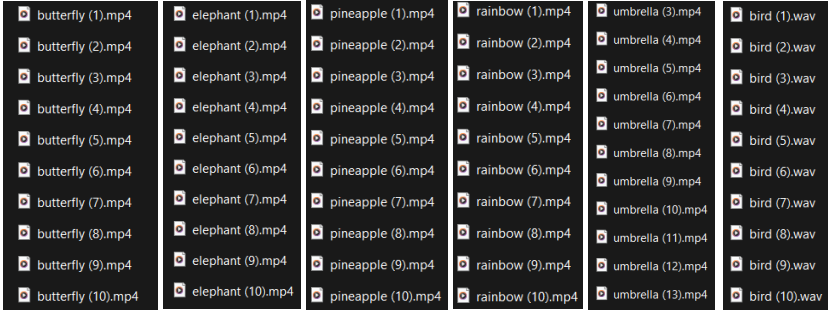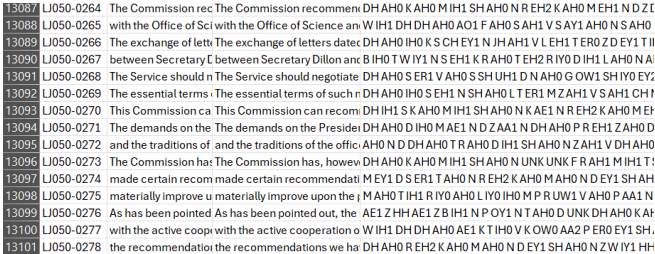
1. Monthly Progress
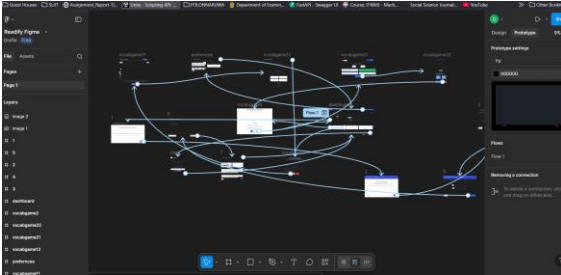
Month	Details and notes of work carried out, problems encountered and how solved etc., sketches and dimensions to be given wherever possible.
2024 -April	• Reaching out to eligible supervisors to request their acceptance of our research proposal. (17.04.2024) • Initial Discussion on Research Topic Functions via Teams with the supervisor (19.04.2024) • Dr. Dasuni Nawinna Accepted our Proposal (19.04.2024)

2024- May	• Supervisor Assigned Mr. Jeewaka Perera as a Co- Supervisor and Created WhatsApp Group. • Discussion on Research Topic Functions with our Co Supervisor at University (29.05.2024)
2024 – June	• Created the TAF Document (15.06.2024 – 16.06.2024) • Discussion on Research Topic Functions with our Co Supervisor at University (20.06.2024) • Signed and verified the TAF document from Supervisor, Co- Supervisor (20.05.2024 -21.05.2024)

	• Submitted the TAF Document (24.06.2024)
2024 - July	• Topic Assessment evaluation. (05.07.2024) • Accepted the Topic with minor changes (05.07.2024) • Analyzed traditional pronunciation learning approaches. • Researched tools and technologies based on pronunciation. • Studied and follow existing tools related to pronunciation error detection. • Studied audio classification technics. • Research how to implement personalized learning paths in that research project. • Discussed with the project team through WhatsApp group call and team meeting.
2024 -August	• Preparing for the Proposal presentation with the co-supervisor (02.08.2024) • Prepared the Proposal presentation slides (03.08.2024) • Preparing for the Proposal presentation with the Team (04.08.2024) • Participated in the proposal presentation and accepted (Minor changes) with the research component (05.08.2024) • Discussion about changes in the research project component with our co-supervisor on MS Teams (07.08.2024)

	• Studied the changes and suggestions of the research component. • Created proposal report (20.08.2024 – 23.08.2024). • Meeting with the supervisor to obtain the signature for the proposal report (24.08.2024). • Proposal report submitted to cloud folder (28-08-2024) • Studied machine learning technics. • Search for audio classification models and technics.	
2024 – September	• Discussion about Future Plans with our co-supervisor on Phone Call (10.09.2024) • Team Discussion on Campus (22.09.2024) • Found an external supervisor who is an English teacher and had a discussion with her. (30.09.2024) • Searched for voice datasets on Kaggle and Hugging Face. And searched for pretrained models of the audio classification. • Try to implement audio to phoneme models in google colab platform. • Make the metadata.csv file. • Plan alternative approaches for handling audio files.	
2024 – October	• Created GitHub Repository (02.10.2024) • External supervisor's physical meeting (26.10.2024) • Team discussion (26.10.2024)	
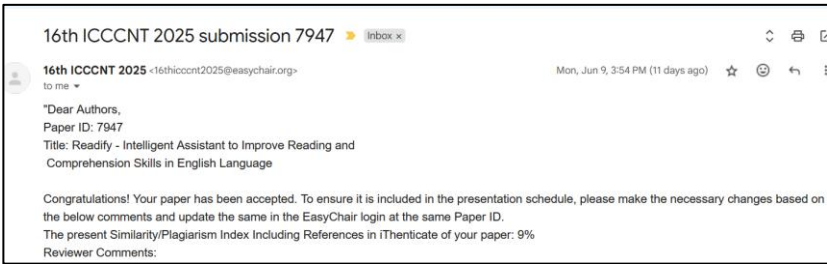
	• Collect more audio files from different individuals. Some of them are shown in the figures below. Around 3,000 audio clips were collected during that time. • Organize audio files in a more structured way and implement the model accordingly. • Try to train audio to phoneme model using dataset. • Discussed with the project team through WhatsApp group call and team meeting.
2024 – November	• Team Discussion on Campus (05.11.2024) • The dataset was enhanced, and relevant details were reorganized to improve the results. • Implement the audio to phoneme model. • Optimized the model to improve accuracy and ensure reliable results. • When an audio file is provided for a word from the given list, the system generates its phoneme sequence.

	• Worked on handling uncommon or out-of-vocabulary words by implementing methods to generate their phoneme sequences accurately.
	• Discussed with team.
	• Observed limitations in phoneme conversion for uncommon words and evaluated different solutions to improve coverage.
	• Tried using Hugging Face Wav2Vec2 model to convert audio into phonemes.
	• Implemented phoneme conversion with the CMU Pronouncing Dictionary.
	• Built the phoneme comparison algorithm using Dynamic Time Warping (DTW).
	• Enhanced the backend to skip processing of low-quality or silent audio.
	• Updated the output format and tested the API endpoint using Postman.
	• Tested the model's performance using sample voice clips.
	• After completing the task, we integrated components and pushed all working functions to Git.
	• Discussed with a friend and made some changes based on their suggestions.
	• Improved the backend implementation by applying clean code principles and best practices.
	• Created web application sketches, wireframes, and prototypes, along with discussions with team members (10.11.2024 – 20.11.2024).
2024 – December	• Team Discussion on Campus (01.12.2024) • Prepared the PP1 Presentation slides (02.12.2024) • Prepared for the PP1 Presentation with team (03.12.2024)

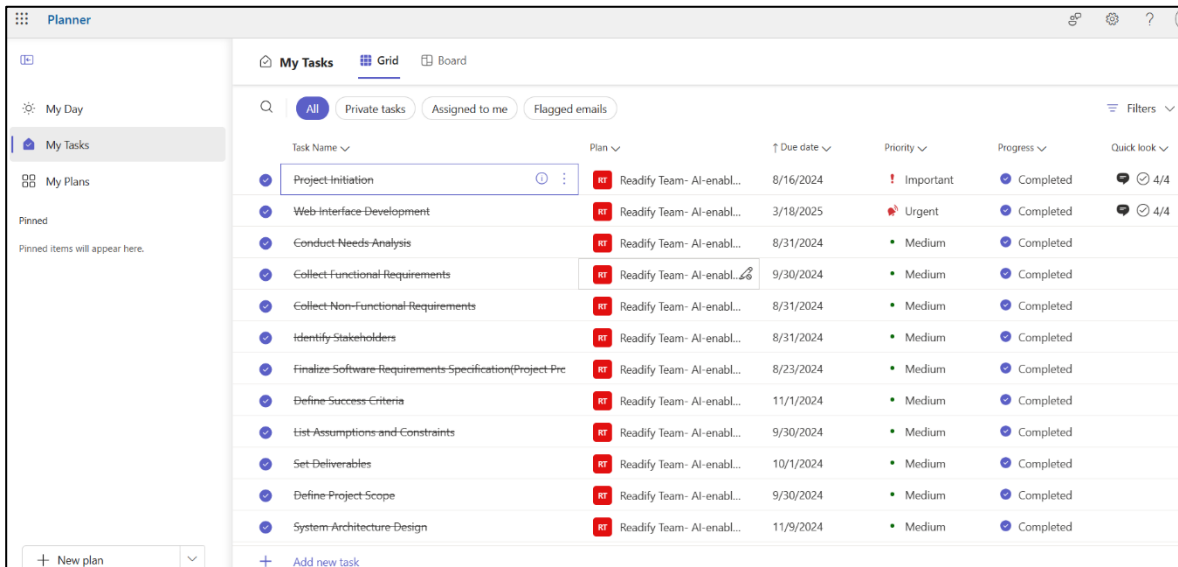|	
	• Faced PP1 and got comments from the panel (04.12.2024) Panel Commet – Improve presentation skills • Submitted Checklist I (Git Repository) to the cloud location (CDAP) (08.12.2025) • Got a meeting with the co-supervisor to address issues found after PP1(16.12.2024) • Discussed with the group and made changes based on panel comments. • Discussed the research paper and future plans with the team. • Enhanced the phoneme conversion method for better accuracy. • Enhanced the phoneme comparison algorithm for improved accuracy. • Built the voice capture feature on the frontend and enhanced handling of recorded audio files. • Enhanced frontend audio capture by integrating echo cancellation, noise reduction, and ensuring consistent sample rate and audio format. • Handled audio capture by requesting user permission and automatically stopping recording after a set time period.
2025- January	• Team discussion (02.01.2024, 10.01.2024, 21.01.2024) • Initialized frontend project with Vite and React.js. • Implemented and handled previous audio recording logic to ensure smooth voice capture. • Integrated Azure Cognitive Services for better speech recognition performance. • Implemented a grapheme-to-phoneme (G2P) model in the backend for better phoneme mapping.

	• Enhanced the phoneme comparison method by refining the DTW-based alignment approach.
	• Integrated fuzzy matching and PanPhon-based techniques for enhanced pronunciation analysis.
	• Completed frontend-backend integration and validated data flow.
	• Sent recorded audio from the frontend to the backend for processing.
	• Manually sent the expected word from the frontend during early testing.
	• Configured the Gemini LLM and wrote prompts to generate words based on specific requirements. Handled the prompt response by stringifying and formatting it in the required format.
	• Improved the user interface with animations and styling using Tailwind CSS, following the planned design structure.
	• Designed the UI to be fully responsive across different screen sizes.
2025- February	• Merge other team members components through the GitHub (10.02.2025) • Attended an online session on "How to Write a Research Paper" conducted by our supervisor (11.02.2025, 18.02.2025) • Created research paper draft (09.02.2025 - 14.02.2025) • Submitted research paper draft (15.02.2025) • Team discussion regarding PP2 (22.02.2025) • Enhanced the UI/UX by highlighting error points in words and providing more engaging feedback. • Implemented practice word generation using Gemini LLM and added sound playback functionality for each word. • Arranged a meeting with the new external supervisor (27.02.2025) • Designed and implemented UI pages to support core features of the system.
2025-March	• Submitted final research paper to the cloud location (CDAP) (06.03.2025) • Created UI/UX Demo Video (15.03.2025) • Team discussion (07.03.2024, 11.03.2024) • Merge other team members components through the GitHub. • Prepared PP2 Presentation slides (16.03.2025) • Prepared for PP2 presentation with the team (18.03.2025) • Submitted Checklist II to the cloud location (CDAP) (17.03.2025) • Participated in PP2 presentation and viva. (19.03.2025)

		Panel Comment – Improve presentation skills. Accurate result?
		• Discussed panel feedback and future project plans with the team.
		• Conducted testing in various environments and with different individuals.
		• Applied improvements according to the findings from testing.
2025-April		• Created Final report (01.04.2025 - 11.04.2025)
		• Submitted the final report to the cloud location (11.04.2025)
		• Enhanced the user interfaces and the user experience under the guidance of the external supervisor (17.04.2025)
		• Initiated the submission of the research paper to journals and conferences. (18.04.2025)
		• Team discussion (20.01.2024, 28.01.2024)
		• Merge members' components through the git hub (30.04.2025)
		• Added a scoring system to evaluate pronunciation performance.
		• Updated the user interface with necessary design and layout changes.
2025-May		• Discussed testing methods for my component with the external supervisor (05.05.2025).
		• Created relevant test cases to validate the functionality
		• Tested the entire project after integrating all functions to evaluate performance and overall behavior.
		• Deployed services using Docker containers.
		• Hosted APIs on AWS Services.
		• Hosted frontend on Netlify.

	• Collaborated with the team to finalize deployment approach and configure CI/CD workflow. • Created deployment report of project (22.05.2025) • Submitted Checklist III to the cloud location (CDAP) (26.05.2025) • Created Research Project Website (25.05.2025) • Prepared the final presentation slides (24.05.2025) • Prepared for PP2 presentation with the team (25.05.2025) • Participated in the final presentation and viva (26.05.2025) • Participated in the Research Project Website Evaluation Viva (26.05.2025)
2025-June	• Got the RP- Acceptance notification (09.06.2025) • Completed the RP – Registration process (19.06.2025) • Published research paper. (29.06.2025)

2. Individual Task Allocation Process

2.1   Assigned Tasks

(MS Planner)