

Languru App

Radiant Team

Fall 23 - CS692 - Capstone Project
Pace University

Our Team



Kate Pham

Developer, Scrum Master



Indeevara Tadikonda

Developer

Our Team



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Quality Analyst and Tester



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Developer



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Developer

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01

Project Description

Project Description	
Project Name:	Languru
Team:	Radiant
Project Description:	<p>Recording voice and breaking down the sound of a word with real-time feedback on users pronunciation accuracy.</p> <p>For customers who want to improve their English pronunciation. the Languru is a mobile app that checks users' single words and provides accurate feedback. unlike the traditional way English learners get feedback from their teachers. our application brings together the best of language and guru to help English learners improve their pronunciation and fluency.</p>
Benefit Outcomes:	
	<ul style="list-style-type: none"> - Users can improve their speaking skill anywhere and anytime. - Users can record their voice and receive feedback from Languru to improve. - Users will have a number of topics to choose to master their speaking skill.
Github Link:	https://github.com/htmwlangu魯/wiki

02

Team Working Agreement

Team Working Agreement

Purpose of the agreement:

- To complete Computer Science Project 1(CS 691) as smoothly as possible.

Name of the Project:

- Languru

Terms of Agreement:

- All the team members are expected to attend the weekly meetings(Wednesday 8:00 PM) without fail
- If in any case you are not able to join the call, you are expected to update the other team members of your absence.
- In the case of absence for a weekly meeting, you are expected to make it up before the next team meeting.
- The weekly meetings are held on zoom and any updates can be communicated through Whatsapp messenger.
- Google workspace, GitHub and Agile can be used to track and divide all of our work.
- You are expected to be active on the WhatsApp messenger group chat for any updates.
- Work should be divided equally amongst the peers.
- Each team member should complete the work before the deadline. In case you are not able to do so, inform your peers so that they can divide the work accordingly. Failing to do so might lead to the decrease of the Team's grade.
- The Scrum Master is responsible for organizing the weekly meets, and everybody should be open to meet virtually more than once weekly if the situation demands it.
- Every team member is expected to be active in the weekly meetings, be productive and open to discussions and give a timely update of their part of the work.

Team Members:

Indeevara Tadikonda	it49412n
Thanh Pham	tp89638n
Musa Nishat	mn64635n
Noel Sam Routhu	nr66642n
Hariharammurthy Krishnamoorthy	hk97281n

03

Personas

Persona 1



"With languru, I can easily practice my English pronunciation for IELTS without having to go through a long sign up process or paying a premium fee."

Name: Areeba

Age: 21

Occupation: University Student

Location: Lahore, Pakistan

Level: Senior

Goals

- Finish her undergrad
- Study for IELTS and GRE
- Apply to MBA programs in the United States

Loves

- School
- Maths
- Spending time with her family

User Description

Areeba is in the final year of her Business Management degree from LUMS University. When she graduates, she wants to get an MBA in the UK

Interests

- Entrepreneurship
- Reading
- Community Organizing

Frustrations

- Struggling to find an affordable and proficient English tutor
- Apps like Duolingo not focusing on speaking and pronunciation enough

Motivations:

- Convenience
- High Quality
- Price



Persona 2



*"When I first came to America, I could barely speak a word of English. Every night, I would open up **languru** and practiced and practiced until I mastered the language, which greatly helped my business"*

Name: Gao

Age: 37

Occupation: Taxi Driver

Location: New York City

Goals

- Save for children's education and retirement
- Open his own taxi company
- Become a chess master

Loves

- His children
- Playing guitar
- Old Kung Fu movies

User Description

Gao moved to the United States four years ago from Beijing. After a year, he brought his family along too. They live happily in Queens.

Interests

- Acquiring a green card
- Entrepreneurship
- Joining City Council

Frustrations

- Culture shocks, language barriers, racism
- Fundraising and organizing for his taxi business

Motivations:

- Convenience
- High Quality
- Price



Persona 3



"In a perfect world, I would spend hours every day with every one of the kids I work with, but that's unfortunately not possible. With languru I can rest easy knowing that some of my kids have a resource they can use anytime which helps them with their speech."

Name: Daniella

Age: 31

Occupation: Speech Pathologist

Location: San Juan, Puerto Rico

User Description

Daniella has loved kids since she was a kid and always knew she wanted to be some kind of children's doctor when she grew up. Today, she helps children with learning and speaking disabilities

Goals

- Raise awareness and money for children's healthcare in PR
- Write a book on speech therapy

Loves

- Kids
- Hiking
- Collecting records

Interests

- Child healthcare
- Medical research
- Development of Puerto Rico

Frustrations

- Giving each patient enough attention
- Lack of medical resources and infrastructure
- Prejudice to those who are differently abled

Motivations:

- Convenience
- High Quality
- Price



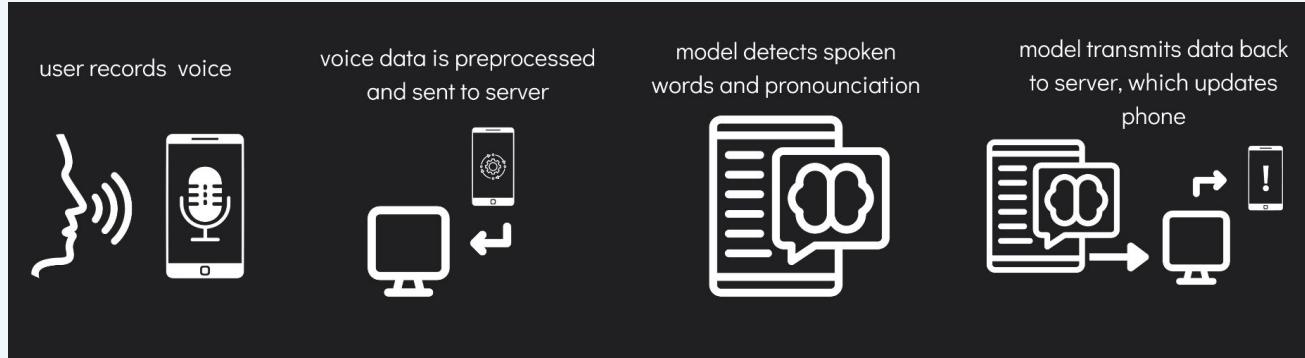
04

Minimum Viable Product

Minimal Viable Product (MVP)

- Mobile application with speech recording capability
- Machine learning algorithm/API to break down individual spoken words, detect, and note incorrect pronunciations
- Server with functionality to receive voice data and send back analyzed data
- Server to host machine learning model

Steps:





Our App Logo

The app's name : "Languru" cleverly merges "language" and "guru" to signify its purpose. The dominant theme for the application will be a soothing shade of blue, reflecting a tranquil and user-friendly.

Mock Up Design

The image displays six mobile phone screens arranged horizontally, illustrating the user interface of the Languru app. Each screen is labeled above it.

- Login:** Shows a sign-in form with fields for Email (Kate@example.com) and Password, and buttons for Sign In, Forgot Password?, and Sign Up.
- Home Page:** Displays a welcome message: "Welcome Kate, Let's improve your pronunciation with Languru!"
- Speaking Topics:** Shows a grid of topics: Basic, Life, Work, Education, Health, and Food.
- Speaking:** Shows a speaking practice session for the word "Work" (/wɜ:k/). A speech bubble says "Excellent!"
- Speaking:** Shows a speaking practice session for the word "Work" (/wɜ:k/). A speech bubble says "Try again, you can do it!"
- Profile:** Shows profile information for Kate Pham (New Jersey), with sections for Personal Information, Notifications, Achievement, Settings, and Edit.

05

Technologies And Diagrams

Technologies



Coding language

Javascript
Python



Database

Amazon Web
Services
(Amplify, S3)



Tools

Amazon Web Services,
React Native, Git,
Github, Xcode,
Visual Studio Code,
Expo, Jira.

AWS Amplify was used to manage authenticated users, authentication flow.

Amplify Studio

languru-app > staging

Local setup instructions

Home

Manage

Content

User management

File browser

Design

UI Library

Set up

Data

Authentication

Storage

Functions

GraphQL API

REST API

Analytics

Documentation

Support

Feedback

User management

Create, view, and manage users and groups for your application.

Users Groups

Users

Actions

Create user

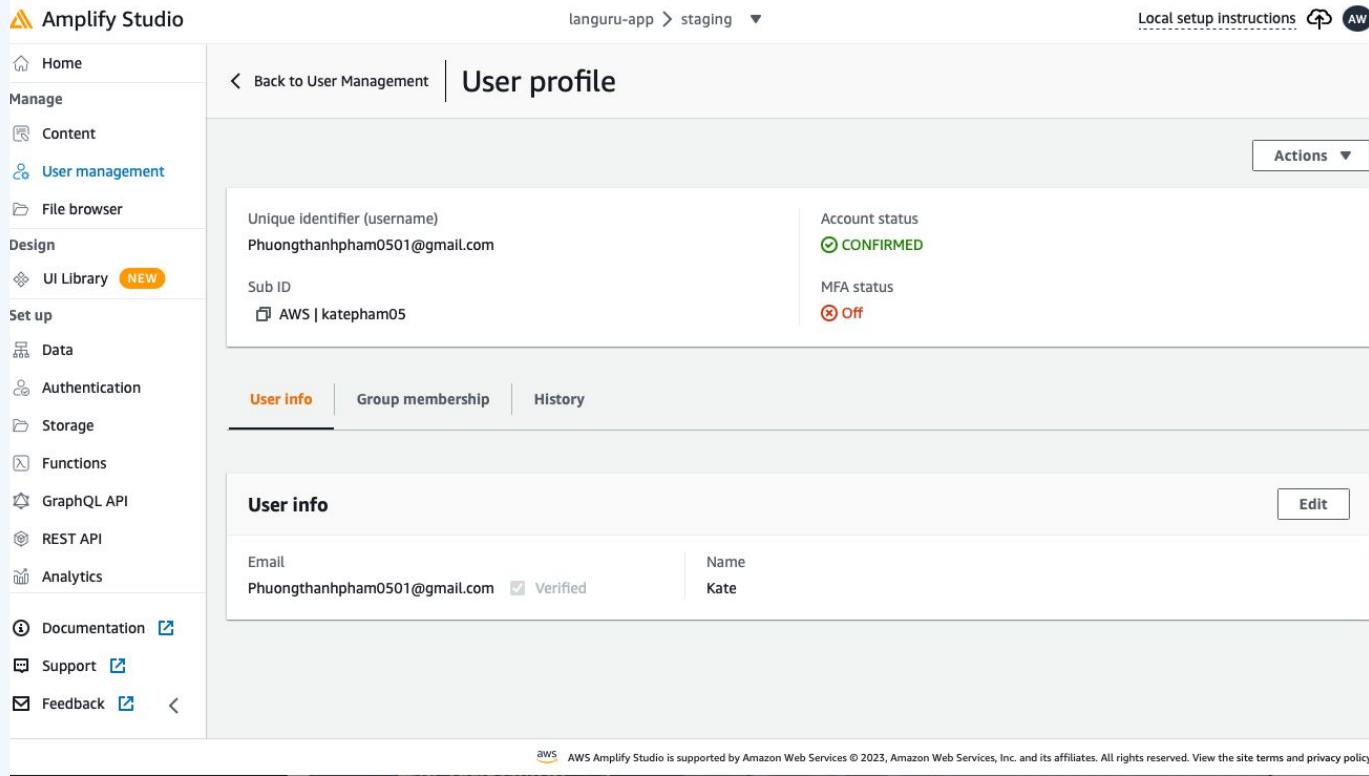
Search Username

Find users by Username

<input type="checkbox"/>	Login	Created Date	Status
<input type="checkbox"/>	Phuongthanpham0501@gmail.com	April 17, 2023 4:44 PM	CONFIRMED
<input type="checkbox"/>	Musansht@gmail.com	April 17, 2023 5:10 PM	UNCONFIRMED
<input type="checkbox"/>	Musansht@gmail.com	April 17, 2023 5:08 PM	UNCONFIRMED

AWS Amplify Studio is supported by Amazon Web Services © 2023, Amazon Web Services, Inc. and its affiliates. All rights reserved. View the site terms and privacy policy .

AWS Amplify was used to manage user's data



The screenshot shows the AWS Amplify Studio interface for managing user profiles. The left sidebar contains navigation links for Home, Manage, Content, User management (selected), File browser, Design, UI Library (NEW), Set up, Data, Authentication, Storage, Functions, GraphQL API, REST API, Analytics, Documentation, Support, and Feedback.

The main content area is titled "User profile" and shows the following details:

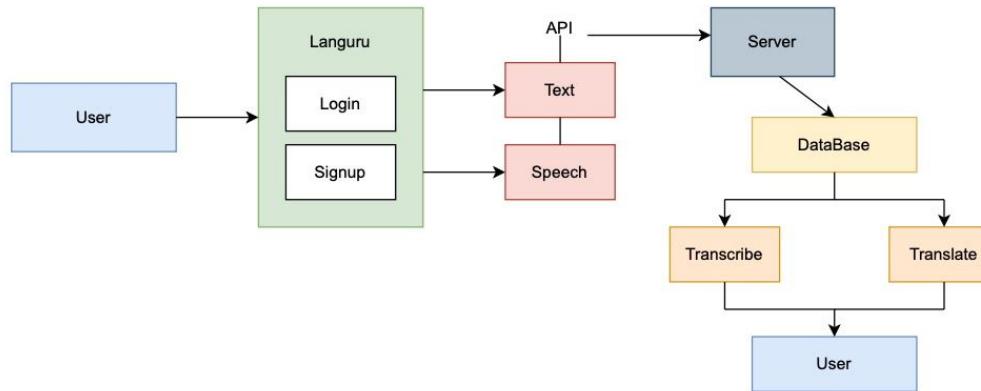
- Unique identifier (username): Phuongthanpham0501@gmail.com
- Sub ID: AWS | katepham05
- Account status: CONFIRMED (green checkmark)
- MFA status: Off (red crossed-out checkmark)

Below this, there are tabs for "User info" (selected), Group membership, and History. The "User info" tab displays:

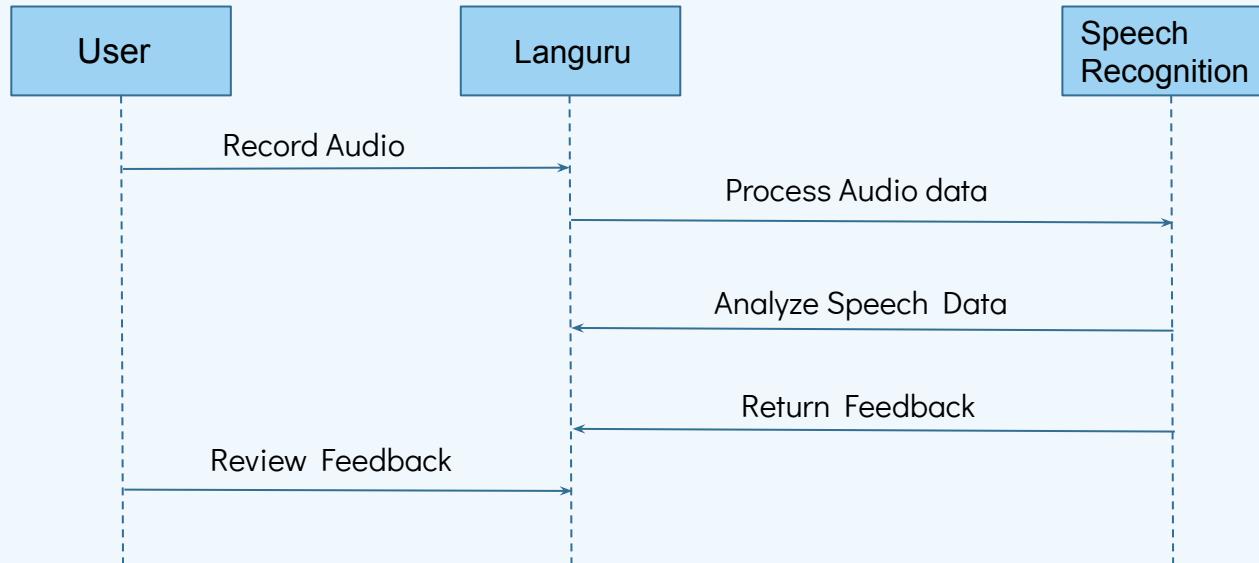
User info		Edit
Email	Phuongthanpham0501@gmail.com	<input checked="" type="checkbox"/> Verified
Name	Kate	

At the bottom of the page, a footer note states: "AWS Amplify Studio is supported by Amazon Web Services © 2023, Amazon Web Services, Inc. and its affiliates. All rights reserved. View the site terms and privacy policy."

System Diagram

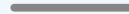


Sequence Diagram



06

Sprint 1 - 4 Recap



SPRINT 1

Brainstorming Project Ideas, Finalizing Project Idea, Awaiting Approval, Setting up JIRA & GitHub, Assign Team Roles, Finalizing Team Working Agreement, Finalizing Technologies

SPRINT 2

Creating a Mock Up Design of the application, Came up with Sequence and Architectural illustrations, Designed User Stories & Test Cases, Developed basic functionalities of recording and playing back in the application

SPRINT 3

Introduced more user stories for profile page, Developed Login, SignUp and Home screens, Developed the functionalities of scoring for recording, Developed Profile page and Settings page basic features

SPRINT 4

Introduced more user stories for words pronunciation, Developed features such that user can know which word was pronounced correctly, Developed User Information page

Sprint 4 vs Sprint 5

Sprint 4

- User can see which part of the word was pronounced correctly and incorrectly
- After user pronounced a word then it automatically graded and indicate which part was pronounced correctly and incorrectly.
- Add more words for user to practice with.
- User can manage their information (phone, email, name)

Sprint 5

- Improved User Interface for Home page, Training page, and Profile page.
- A whole sentence was added for user practice.

07

Improvements

Improvement made from Professor's feedback

- ❖ Added API documentation.
- ❖ The Velocity charts and burndown chart were improved.
- ❖ Added story point estimate at Sprint Backlog.
- ❖ Updated stories and acceptance criteria with user stories and their keys.

08

Product Backlog And Sprint 5 backlog

Product Backlog

Issue Type	Key	Name
Story	LNG-110	As an application user, I want a user-friendly and intuitive interface that makes navigation and learning straightforward and enjoyable.
Story	LNG-111	As an application user, I want to customize their app experience, including themes or color schemes.
Story	ST-7	As an application user, I want to be able to practice with long sentences.
Story	ST-8	As an application user, I want to be able to learn more about tips and lessons which help me improve my pronunciation.
Story	ST-9	As an application user, I want my profile page have my avatar, personal information and eye-catching design.
Story	ST-10	As an application user, I want the ability to set goals for my language improvement and receive reminders and motivation to achieve those goals.

Sprint 5 Backlog

Issue type	Key	Name	Story Point Estimate
Story	ST-7	As an application user, I want to be able to practice with long sentences.	8
Story	LNG-110	As an application user, I want a user-friendly and intuitive interface that makes navigation and learning straightforward and enjoyable.	3
Story	ST-9	As an application user, I want my profile page have my avatar, personal information and eye-catching design.	3
Task	ST-10	Finish API Documentation	1
Task	ST-11	Update Technical Paper	5

STORIES COMPLETED AND STORIES NOT COMPLETED

Name	Status	Date
As an application user, I want to be able to practice with long sentences.	To be Done	
As an application user, I want a user-friendly and intuitive interface that makes navigation and learning straightforward and enjoyable.	Done	10/02/2023
As an application user, I want my profile page have my avatar, personal information and eye-catching design.	Done	10/02/2023
Finish API documentation	Done	10/02/2023
Update Technical Paper	To be done	

Stories and Acceptance Criteria

Stories	Summary	Status
LNG -89	<p>As a customer, I want to be able to receive feedback about my pronunciation So that I can check if I'm pronounced correct or incorrect and improve Scenario customer want to check their pronunciation Given I'm in a role of logged in user When I open the Training page Then the app shows a record button and a sample words And when I recorded my voice, the feed back and scored will show up on screen.</p>	Done
LNG - 90	<p>As a customer, I want to be able to practice on different topics So that I can improve my pronunciation Scenario customer want to improve their pronunciation Given I'm in a role of logged in user When I open the Training page Then the app shows a number of popular topics: life, food, education,.. And when I clicked on a topic, it will show many words based on that topic.</p>	Done

Stories and Acceptance Criteria

Stories	Summary	Status
LNG -91	<p>As a customer, I want to be able to update my personal information So that I can manage it Scenario customer want to update their phone Given I'm in a role of logged in user When I open the profile page Then the app shows a list of user information And when I click on update button, my profile information will change as expected.</p>	Done
LNG - 92	<p>As a customer, I want to have a navigation bar So that I can go between screen easier Scenario customer want to navigate from homepage to training page Given I'm in a role of logged in user When I in the home page Then I clicked on Training icon at the bottom of the screen And I was navigated to the desired page.</p>	Done

Test Cases

TEST CASE ID	TEST SCENARIO	TEST CASE	PRE-CONDITION	TEST STEPS	TEST DATA	EXPECTED RESULT	ACTUAL RESULT	STATUS (PASS/FAIL)
TC_LOGIN_1	Verify the login of email	Enter valid User Name and valid Password	1. Need a valid email Account to do login	1. Enter User Name 2. Enter Password 3. Click "Login" button	<Valid User Name> <Valid Password>	Login Successful	Login Successful	PASS
TC_LOGIN_1	Verify the login of email	Enter valid User Name and invalid Password	1. Need a valid email Account to do login	1. Enter User Name 2. Enter Password 3. Click "Login" button	<Valid User Name> <Invalid Password>			
TC_LOGIN_1	Verify the login of email	Enter invalid User Name and valid Password	1. Need a valid email Account to do login	1. Enter User Name 2. Enter Password 3. Click "Login" button	<Invalid User Name> <Valid Password>			
TC_LOGIN_1	Verify the login of email	Enter invalid User Name and invalid Password	1. Need a valid email Account to do login	1. Enter User Name 2. Enter Password 3. Click "Login" button	<Invalid User Name> <Invalid Password>	A message "The email or password you entered don't match" is shown	A message "The email or password you entered don't match" is shown	PASS

TEST CASE ID	TEST SCENARIO	TEST CASE	PRE-CONDITION	TEST STEPS	TEST DATA	EXPECTED RESULT	ACTUAL RESULT	STATUS (PASS/FAIL)
TC_SIGNUP_2	Verify sign up	Enter valid User Name and valid Password	1. Need a valid user name and password (characters and number from1 to 9) to sign up	1. Enter User Name 2. Enter Password 3. Click "signup" button	<Valid User Name> <Valid Password>	Sign up Successful	Sign up Successful	PASS
TC_SIGNUP_2	Verify sign up	Enter used User Name	1. Need a valid user name and password (characters and number from1 to 9) to sign up	1. Enter User Name 2. Enter Password 3. Click "signup" button	<used Username >	A message "The user name is already used" is shown	A message "The user name is already used" is shown	PASS
TC_SIGNUP_2	Verify sign up	Enter invalid User Name and invalid Password	1. Need a valid user name and password (characters and number from1 to 9) to sign up	1. Enter User Name 2. Enter Password 3. Click "signup" button	<Invalid Password>	A message "password don't match our requires" is shown	A message "password don't match our requires" is shown	PASS

TEST CASE ID	TEST SCENARIO	TEST CASE	TEST STEPS	TEST DATA	EXPECTED RESULT	ACTUAL RESULT	STATUS (PASS/FAIL)
TC_HOMEPAGE_3	Verify the HOME PAGE	A welcome message should show up on screen			Check if a welcome message appear on the home screen		PASS
TC_HOMEPAGE_3	Verify the HOME PAGE						
		User should be able to search from homepage			Homepage can show expected results.		
TC_HOMEPAGE_3	Verify the HOME PAGE	User should be able to open the home page			Homepage should appear when user click on it.		PASS

TEST CASE ID	TEST SCENARIO	TEST CASE	PRE-CONDITION	TEST STEPS	TEST DATA	EXPECTED RESULT	ACTUAL RESULT	STATUS (PASS/FAIL)
TC_FGPASS_6	Check on Forgot Password	Should direct to the email in order to change password.				Password resetted and send back to login page.		PASS

TEST CASE ID	TEST SCENARIO	TEST CASE	PRE-CONDITION	TEST STEPS	TEST DATA	EXPECTED RESULT	ACTUAL RESULT	STATUS (PASS / FAIL)
TC_PROFILE_4	Check on Profile editable					Users can existing profile information successfully.		PASS
TC_PROFILE_4	Check on features in Profile page					On the Profile page, users should be able to see list of features		PASS

TEST CASE ID	TEST SCENARIO	TEST CASE	PRE-CONDITION	TEST STEPS	TEST DATA	EXPECTED RESULT	ACTUAL RESULT	STATUS (PAS S/ FAIL)
TC_SPEAKING_5	Verify the speaking page	User should be able to record their voice				Record voice successfully		PASS
TC_SPEAKING_5	Verify the speaking page	User should be able to see their feedback after they recorded their voice.				The score will show up after voice was recorded.		PASS
TC_SPEAKING_5	Verify the speaking page	User should be able to see the topics that they want to practice and open it				The topics category will show up as expected.		PASS
TC_SPEAKING_5	Verify the speaking page	User should be able to see where was pronounce incorrectly.				User can see the part was pronounce incorrect which is underlined.		PASS
TC_SPEAKING_5	Verify the speaking page	User should be able to access the Speaking page				User can see the part was pronounce incorrect which is underlined.		PASS

09

Metrics

Completed tasks

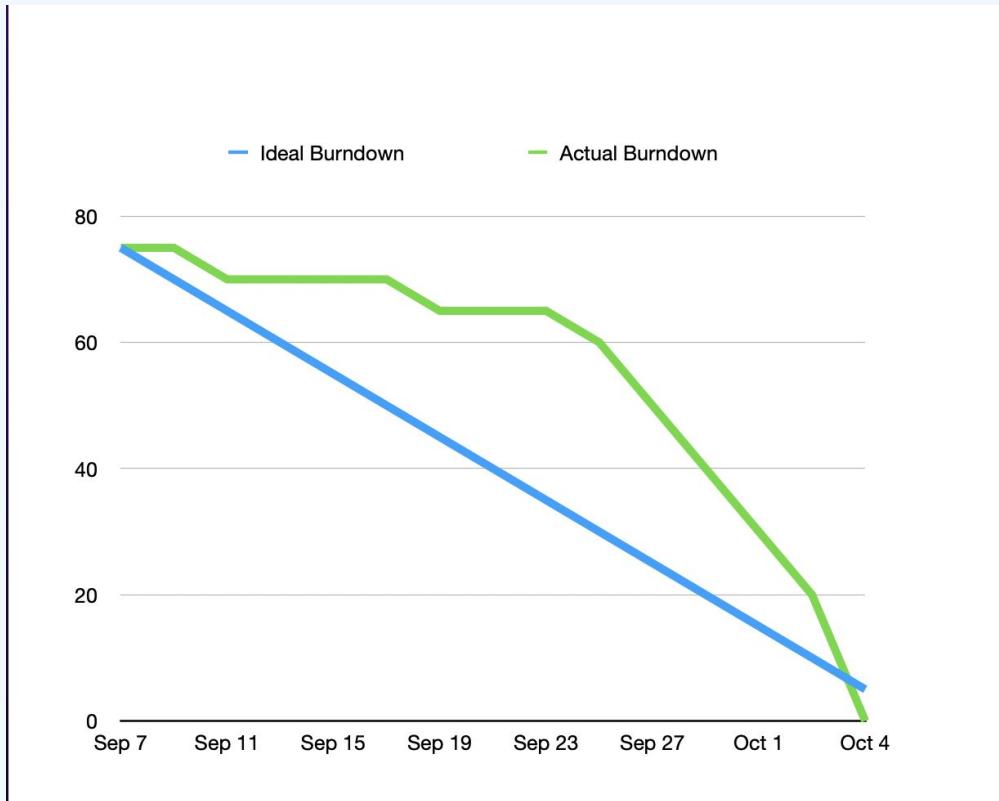
▼ Sprint 5

<input type="checkbox"/>	Task	Status	Priority	Story Points
<input type="checkbox"/>	Deliverable 5 Presentation		Done	Critical
<input type="checkbox"/>	Deliverable 5 PPT		Done	Critical
<input type="checkbox"/>	Metrics		Done	Low
<input type="checkbox"/>	Tasks for sprint 6		Done	Medium
<input type="checkbox"/>	Product Backlog		Done	High
<input type="checkbox"/>	Stories completed for sprint 5		Done	High
<input type="checkbox"/>	Project Demo		Done	High
<input type="checkbox"/>	Slides for API		Done	Low
<input type="checkbox"/>	Retrospective		Done	Medium
<input type="checkbox"/>	+ Add task			



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sum

Burndown Chart



- The graph shows the burndown of story points along with the days.

10

Retrospective

Retrospective

What went well

We worked hard to deliver the presentation on time. Our app was improved with friendly user interface.

Next Steps

- Schedule regular meetings
- Set specific goals for each meeting and have the commitment of each team members.
- Communicate to find new ideas for our application.

What hold us back

- We cannot meet regularly to discuss the project and keep track progress, thus causing delays and procrastination.
- Some team members did not have specific technical knowledge which resulted in us not being able to implement some functionalities and develop new ideas for our application.

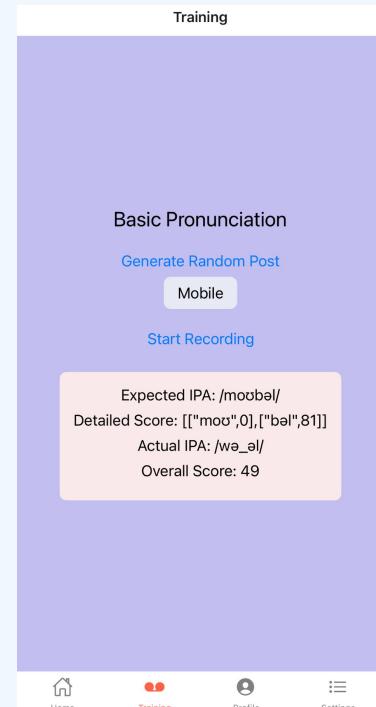
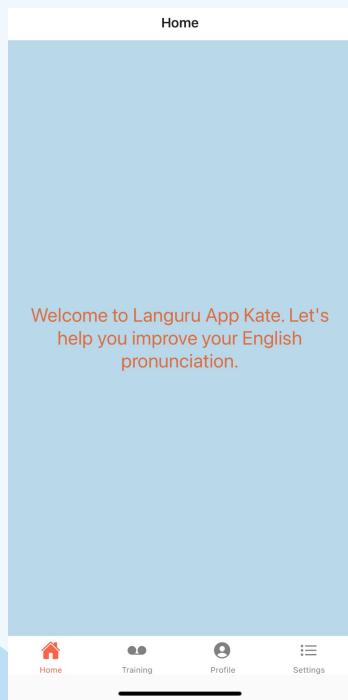
11

Sprint 6 plan

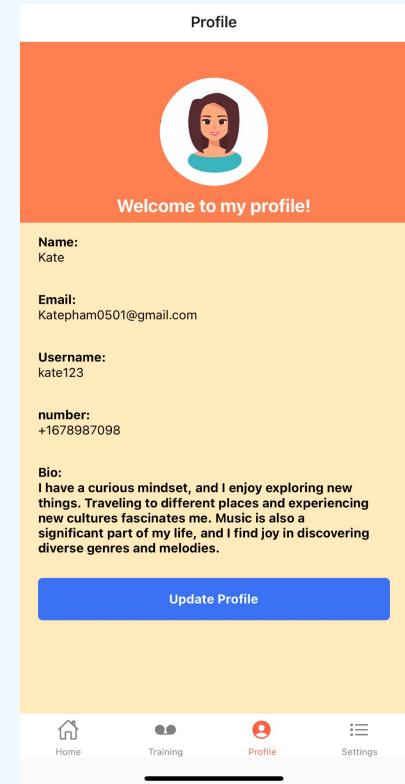
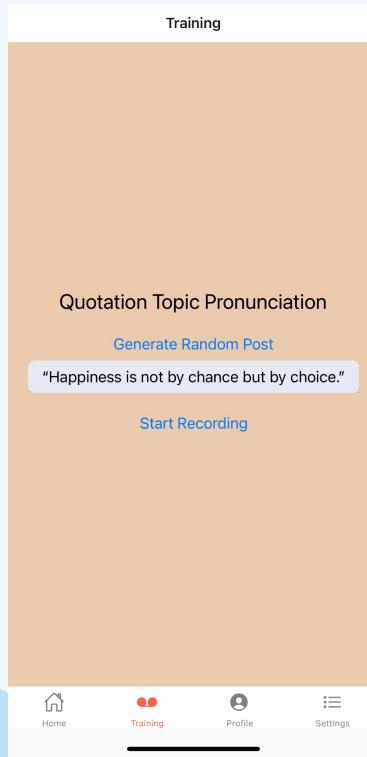
Stories planned and committed for Sprint 6

Issue Type	Key	Name	Status	Story Point Estimate
Story	LNG-111	As an application user, I want the ability to set goals for my language improvement and receive reminders and motivation to achieve those goals.	To do	3
Story	ST-8	As an application user, I want to be able to learn more about tips and lessons which help me improve my pronunciation.	To do	3
Task	LNG-70	Update Technical Paper	To do	5

App Screenshots



App Screenshots



API Overview



We use a Rapid API for our mobile application. This API allows us to generate a pronunciation assessment after the user records their voice in English.

API key

```
X-RapidAPI-Key : '5623000057msh  
d4b67eaccabf3f7p1b2ec9jsn33578c2e2c  
23'
```

API Sample Request

```
data: {  
  {  
    "audio_base64":  
"Uk1GRmBLAgBXQVFZm10IBAAAAABAAEAgD4AAAB9AACABAAZGF0YTxLAgABAP7/AgD+/wIA//8BAP7/Ag  
D+/wIA//8AAAAE/v8CAP7/AgD+/wMA/P8FAPr/BgD7/wQA/f8CAP7/AgD+/wEAAQD+/wEAAAAAAAAAQD9/  
wQA/f8CAP7/AgD+/wMA/f8CAP//AAABAP//AgD8/wUA/P8DAP7/AQD+/wIA/v8BAP//AAD//wIA//8CAAAA  
AQACAAAAAwD//wMA/v8DAPz/AgD9//7///8///v/9///+/wMA/v8NABYAEQASAA8ACgAJAAoACwA  
JAA4ABwAMAACABQAIAAIACAACAAUAAgAAAP7/BwAcABIAEgAMAACAAwACAAUAAwAGAAYAAwAGAAEAAgADAA  
AAAwABAP7/AAD4//7/9f//x/9f/1//D/8//u//H/7v/t/+7/7f/u//D/7f/*/+z/8f/s//L/7P/w/+3/8  
f/u//P/8f/3//D/+v/y//r/9f/3//v/+f/8//v/+//7//7//P/////////8AAP7/AgD//wQA/v8EAAwD9/wU  
AAQABAAQAAAAGAAAABQADAAQABQADAAUABQAEAAcABAAGAAQABwAEAAgAAwAIAAUABwAHAAQACAACAAgAAw  
AIAAQABwABAACAAAAHAAEABQAEAAQAAwAEAAEABAAAAAAQAAAABAA==" ,  
    "audio_format": "wav",  
    "text": "apples"  
  }  
}
```

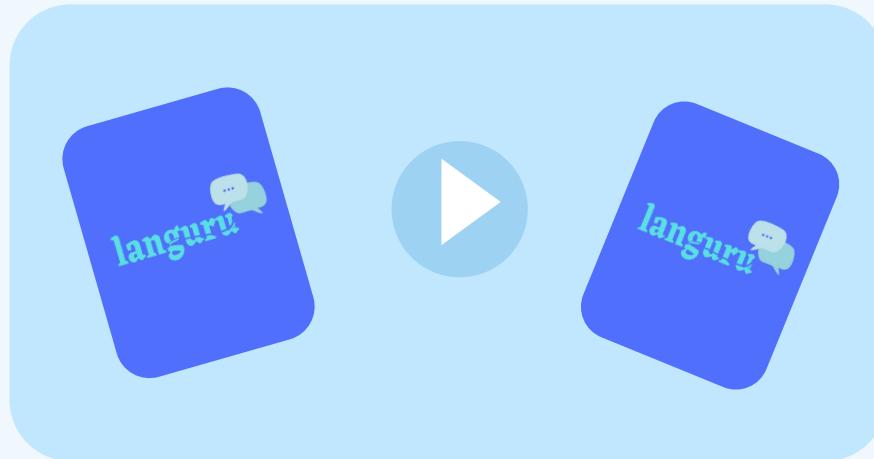
API Sample Response

```
{  
    "status": "success",  
    "text_score": {  
        "text": "apple",  
        "word_score_list": [  
            {  
                "word": "apple",  
                "quality_score": 100,  
                "phone_score_list": [  
                    {  
                        "phone": "ae",  
                        "stress_level": 1,  
                        "extent": [  
                            12,  
                            27  
                        ],  
                        "quality_score": 100,  
                        "stress_score": 100,  
                        "predicted_stress_level": 2,  
                        "word_extent": [  
                            0,  
                            1  
                        ],  
                        "sound_most_like": "ae"  
                    },  
                    ...  
                ]  
            }  
        ]  
    }  
}
```

12

Live Application Demo

Languru demo



[Click here to view demo!](#)

Thank You!

[Wiki page link](#)

[Updated Technical Paper](#)

[User Manual Link](#)

[Deployment Manual Link](#)

[API Documentation](#)

RADIANT TEAM