CmpE451 Fall 2019 Group3 - FINAL MILESTONE

1) Final Project Assessment

1.1) Introduction

Bulingo is a language learning platform. Since language is a tool for communication, Bulingo is also social. In Bulingo each user has a profile where other users can read about the users, also the comments done about them and their rating. Bulingo lets users practise with exercises for their levels, send writings to each other and evaluate the writings from different users to practice both reading and writing and provide a chat platform because we know that the best way to learn a language is to use it in the real life. Bulingo is also like a social platform where users can post comments about other users and rate them.

There are lots of language learning platforms in the market but in the most of them you are alone. Just complete the exercises and level up. We believe that this is not the right approach to learn a language. We believe the best way to learn a language properly is to communicate and Bulingo is a great app to learn a language with communication.

1.2) Milestone Assessment

In our first milestone we had completed the login, sign-up, and log-out features of our web and mobile applications, and the language level determination feature to correctly identify how well the user knows a certain language. We also had completed the outlines of the profile page for both web and android application.

For the second milestone, firstly, we fixed our problems from the first milestone. We improved the UI in web and android. We also added the meanings of level ratings for users to understand. Then, moving forward, we finalized our work with profile page. Now, users can comment -and rate- on other people's profile pages on both web and Android app. Profile pages now can be edited in both web and mobile in the user's own profile page, which includes uploading new avatars and bio texts to database. We added user search functionality to find other users for chatting or viewing/commenting their page. In addition to these, we implemented chat functionality where you can view your chat history and message other users for both web and android. We implemented outline of the exercise page -with static content- on mobile.

For the Final milestone, both android and web teams implemented the Exercise page. After that, search page implementation were updated to search an exercise. Exercises can be searched according to tags,exercise names, language levels,languages and exercise types. Exercises are filtered according to user's language level during exercise listing part. When a user wants to take an exercise, exercises which are higher than user's level are listed. Afterwards, we implemented the recommendation. Recommendation is a feature for sending writing, which is recommendation of the proficient users to send an essay. Then, we implemented the user progress. Progress is a feature for solving exercise, which gives the number of completed exercises and these exercises' success. The radar graph on the profile page, holds the exercise levels and presents these levels on a user friendly graph. Writing and annotation are huge parts of the project. We implemented writing and annotation part together. In writing part, a user can send an essay to a recommended user. Also, a proficient user can receive and annotate an essay. On annotation part, the user can annotate a text or an image. Additionally, we implemented create exercise feature for a user, we assumed that there exists an admin who controls exercises content.Finally, exercise page is updated as read-only for guest users on the Website. A guest user can sign up and see all the exercises, but they can not see content of these exercises.

1.3) Final Assessment

Our project was to develop a Language Learning Platform. This platform enables a user to take level determination exam and then continue to learn a language by solving exercises. There are various exercises that are listening, reading, grammar, vocabulary and writing. Platform is also provide to use annotations for evaluating essays.

We had some difficulties during implementation period because we started wrongly prioritizing, we had difficulty in completing important parts towards the end of the project. We could do exercise part before the profile page.

Besides, we gained experience in teamwork, meetings and division of labor. Except milestone 2, we finished our work on time. Our functionalities are mostly completed. Also, the interface of our application for both mobile and web is very well designed.

In the start of project we had meetings with the whole team. Additionally, each sub-team(android,frontend and backend) completed their work by setting small meetings on their own. Aside meeting, other means of communications were conducted to complete our deliverables. These methods are github issuses, whatsapp groups.

2) List and status of deliverables

Note: See project plan for more.

Name	Delivery Date	Delivered
(Backend) Exam API: Get exam questions with choices	15.10.19	DONE
(Backend) Exam API: Post user answers and get evaluation grade	15.10.19	DONE
(Backend) Search API: User Search	23.10.19	DONE
(Backend) Search API: Exercise Search	23.10.19	DONE
(Backend) Updating User Profile	01.11.19	DONE
(Backend) Creating User Comment	07.11.19	DONE
(Backend) Exercise API: Get language level for choosen exercise type	15.11.19	DONE
(Backend) Exercise API: Get questions for an exercise	15.11.19	DONE
(Backend) Exercise API: Post answers	15.11.19	DONE
(Backend) Writing API: Save, List, Get, Send, Recommendation to send for Writing	21.12.19	DONE
(Backend) Annotation API: List, Get, Create, Delete annotation	20.12.19	DONE
(Backend) Exercise API: Create new exercise	22.12.19	DONE
(Frontend) Comment: Send comment to a user from user's profile page	21.11.19	DONE
(Frontend) Chat: Send message to a user from user's profile page	21.11.19	DONE
(Frontend) Exercise: Designing Exercise selection page	25.11.19	DONE
(Frontend) Exercise: Designing Exercise list page	25.11.19	DONE
(Frontend) Exercise: Implementing exercises pages	26.11.19	DONE
(Frontend) Recommendation: Implementing user recommendation for sending writing	17.12.19	DONE
(Frontend) Progress: Implementing progress page	18.12.19	DONE
(Frontend) Writing: Designing writing pages for both sending and receiving essays	19.12.19	DONE
(Frontend) Writing: Implementing writing pages	23.12.19	DONE
(Frontend) Exercise: Implementing create exercise page	23.11.19	DONE
(Frontend) Annotation: Implementing text annotation	23.12.19	DONE
(Frontend) Annotation: Implementing image annotation	24.12.19	DONE
(Frontend) Profile Page Update: Implementing radar graph	24.12.19	DONE
(Frontend) Exercise Page Update: Implementing the exercise page as only read for guest users	24.12.19	DONE
(Mobile) Chat: Chat screen	01.11.19	DONE
(Mobile) Chat: Get messages	31.10.19	DONE
(Mobile) Chat: Send messages	06.11.19	DONE
(Mobile) Chat: Chat history screen	07.11.19	DONE
(Mobile) Search: Design search screen	14.11.19	DONE
(Mobile) Search: Implement user seach	19.11.19	DONE
(Mobile) Comment: Send comment to other user	21.11.19	DONE
(Mobile) Profile Update: Designing profile page to adding setting button	22.11.19	DONE
(Mobile) Profile Update: Implementing permission request activity from device	26.11.19	DONE
(Mobile) Profile Update: Change bio	22.11.19	DONE
(Mobile) Profile Update: Change avatar	25.11.19	DONE

Name	Delivery Date	Delivered
(Mobile) Exercise: Designing Exercise selection screen	25.11.19	DONE
(Mobile) Exercise: Implementing exercises pages	27.11.19	DONE
(Mobile) Profile Page : Implementing progress bar for exercises and language	09.12.19	DONE
(Mobile) Recommendation: Implementing user recommendation for sending writing	17.12.19	DONE
(Mobile) Writing: Designing writing screens for both sending and receiving essays	19.12.19	DONE
(Mobile) Writing: Implementing writing screen	23.12.19	DONE
(Mobile) Annotation: Implementing annotation	23.12.19	DONE

Details about deliverables - Android

Search : User can search for other users. They can search for exercises according to choosen language, type and level.
Recommendation : User based recommendation when user wants to send writing.
Comment : User can comments on other user's bio.
Chat: User can send and receive messages from/to other users.
Profile Update : Users can update their own profile pages by changing their avatar and bio.
Exercises: User can do listening, reading, grammar and vocabulary exercises.
Annotation : User can annotate writing exercises that sent to her/him.

3) A summary of coding work done by each team member

Team Member	Contributions
Burak İlkay Akgün	I am working in frontend with Neval and Hilal.After milestone 2, I designed and implemented the exercise search page. I and Neval designed and implemented writing sending page with file uploading functionality. I and Neval designed and implemented text annotation for the essays that are been written on browser for sending to other users. Also I and Neval designed and implemented image annotation for the essays that are been uploaded on browser to sending other users.
Samet Demir	I am a member of backend team. For final milestone, I fixed the problems of the Writing API implemented by Berkay (basically redesigned and rewrote most of the Writing API). Then, I designed and implemented the complete Annotation API. I updated "create comment endpoint" such that it calculates the overal ratings of the users from the average of the comment ratings. I added image uploading feature to Writing API. I implemented "create new exercise endpoint" and "language progress radar endpoint". Furthermore, I fixed some bugs in Writing API and Annotation API. Finally, I debugged image annotation feature of the android and frontend applications (synchronizing the image annotation between android and frontend) since coordinates of the annotations were not properly handled by android and frontend teams. I also help the frontend team in the development and debugging of exercise, writing and annotation features. For the delivery, I prepared the code, documentation, database config & dump and packaged web application.
Yağmur Kahyaoğlu	I am a part of the Android sub-team. After the previous milestones, we implemented exercise pages for listening, writing, vocabulary, grammar and reading exercises with Bartu and Ebru. We also implemented exercise search feature. I mostly worked on backend communications and view adapters for the features. Bartu and I implemented sent & recieved writing pages and writing reviewing page and also text annotation feature to make and display annotations.
Bartu Ören	I am in the Android sub-team. In addition to the previous milestones, we implemented exercise search with Yağmur and Ebru. I designed the filter layout and wrote the Java code for it. We implemented listening, grammar, vocabulary, writing, reading exercise pages with Yağmur and Ebru. I took part mostly in button functionalities and layouts for all of these exercise pages. For text annotation, I worked with Yağmur to implement it for sent & received writing pages. I also implemented the image annotation feature for android, working with Java, xml and handling database connections.

Team Member	Contributions
Sabri Bayrakdar	I am a member of the backend team with Samet and Berkay.As a continuation of previous milestones, I implemented language and exercise progress api endpoints which are used to get progress.Accordingly I created progress model and seeder files.After progress implementation, I rearranged exercise evaluate api endpoint.Because when a user complete an exercise, the progress information is needed to update (post progress) so that the user can keep tracking his/her own progress.Besides the progress implementation, I also implemented recommendation api endpoint.In the meantime, I realized and cleared unnecessary codes in some endpoints which I implemented previously.Finally, I added over 20 users in database in addition the existing users so that the project seems more realistic.
Ebru Zorlu	I am working in the Android sub-team. For final milestone, we implemented exercise search, listening, reading, grammar, vocabulary, writing exercise pages and annotation part with Yağmur and Bartu.
Neval Tüllük	
Berke Can Gürer	
Berkay Özerbay	I was in the backend team. For final milestone, I implemented post writing and get writing by username endpoint.I also created writing model and a sample seed and edited time to time according to coming changes.
Hilal Mente	I am a member of frontend team. In addition to the previous milestones, I implemented listening exercise and exercise filtering with Neval. After second milestone feedbacks, I implemented indicating the correct answers of questions and the user's number of correct answers after submitting the exercises' answers. Also, I implemented the radar graph which holds the levels of exercises according to exercise results.

5) Annotation Implementation & W3C Standard Compliance

Our annotation implementation directly follows the W3C Web Annotation Data Model (https://www.w3.org/TR/annotation-model/). It consists of 4 endpoints for creating, deleting, listing and getting annotations (see API documentation for details). The creating annotation endpoint takes the annotation in the W3C Web Annotation Data Model format and saves it. The listing and getting annotations endpoints return the annotations in W3C Web Annotation Data Model format.

Most of the features of the W3C Web Annotation Data Model are supported. Here are the supported features:

W3C Web Annotation Data Model Feature	Supported
Annotations may have @context, id, type, body, target, creator, motivation, created, and modified fields.	YES
The Annotation must have 1 or more @context values and http://www.w3.org/ns/anno.jsonld must be one of them. If there is only one value, then it must be provided as a string.	1 @context only
An Annotation must have exactly 1 IRI that identifies it. (id)	YES
An Annotation must have 1 or more types	1 type only
Annotations may have 0 or more Bodies.	YES
Annotations may have 1 or more Targets.	YES
Annotations may have information about the context in which the Annotation and any External Web Resources were created, modified and used. (creator, motivation, created, and modified fields)	YES
The Target or Body resource may be a Web Resource.	YES
Resources may have id, value, source, type, format, language, processingLanguage, textDirection, creator, purpose and selector fields.	YES
Bodies or Targets which are External Web Resources must have exactly 1 id with the value of the resource's IRI.	YES
The Body or Target should have exactly 1 format associated with it, but may have 0 or more. The value of the property should be the media-type of the format, following the [rfc6838] specification.	YES

W3C Web Annotation Data Model Feature	Supported
The Body or Target should have exactly 1 language associated with it, but may have 0 or more, for example if the language cannot be identified or the resource contains a mix of languages. The value of the property should be a language code following the [bcp47] specification.	YES
Each Body and Target may have exactly 1 processingLanguage. The value of the property should be a language code following the [bcp47] specification. If this property is not present and the language property is present with a single value, then the client should use that language for processing requirements.	YES
The Body or Target may have exactly 1 textDirection associated with it. The value of the property must be one of the directions (ltr, rtl, or auto).	YES
The Body or Target may have 1 or more types (Dataset, Image, Video, Sound, Text)	YES
The Target or Body resource may be more specific than the entity identified by the resource's IRI alone.	YES
The Target or Body resource may be a specific segment of the resource. (Specific Resources)	YES
There may be 0 or more Motivations associated with the SpecificResource using purpose. (purpose)	YES
There may be 0 or more selector relationships associated with a Specific Resource. (FragmentSelector and Text Quote Selector)	YES
Selectors may have type, value, conformsTo, exact, prefix, suffix, start, and end fields.	YES
FragmentSelectors/TextQuoteSelectors must have exactly 1 type and the value must be FragmentSelector.	YES
The FragmentSelector must have exactly 1 value property.	YES
The Fragment Selector should have exactly 1 conformsTo link to the specification that defines the syntax of the fragment and must not have more than 1.	YES
Each TextQuoteSelector must have exactly 1 exact property.	YES
Each TextQuoteSelector should have exactly 1 prefix property, and must not have more than 1.	YES
Each TextQuoteSelector should have exactly 1 suffix property, and must not have more than 1.	YES

Here is an example annotation we use to annotate a writing image:

```
{
    "@context": "http://www.w3.org/ns/anno.jsonld",
    "id": "http://localhost/api/annotation/1",
    "type": "Annotation",
    "creator": "user",
    "created": "2019-12-21T04:21:07.387Z",
    "modified": "2019-12-21T04:21:07.387Z",
    "body": {
        "type": "TextualBody",
        "value": "'is' should be replaced with 'are'"
        "format": "text/plain"
    },
    "target": {
        "id": "http://18.184.207.248/api/writing/213312",
        "type": "Image",
        "creator": "berkay",
        "selector": {
            "type": "FragmentSelector",
            "value": "xywh=50,50,640,480",
            "conformsTo": "http://www.w3.org/TR/media-frags/"
        }
    }
}
```

Here is an example annotation we use to annotate a writing text:

```
{
    "@context": "http://www.w3.org/ns/anno.jsonld",
    "id": "http://localhost/api/annotation/2",
    "type": "Annotation",
    "creator": "user",
```

```
    "created": "2019-12-21T04:21:07.387Z",
    "modified": "2019-12-21T04:21:07.387Z",
    "body": {
        "type": "TextualBody",
        "value": "'is' should be replaced with 'are'"
        "format": "text/plain"
    },
    "target": {
        "id": "http://18.184.207.248/api/writing/6757",
        "creator": "berkay",
        "type": "Text",
        "selector": {
            "type": "FragmentSelector",
            "conformsTo": "http://tools.ietf.org/rfc/rfc5147",
            "value": "char=0,10"
        }
    }
}
```


6) API documentation

Note: API doc is also available online on http://18.184.207.248/api/docs/.

bounswe2019group3-backend v1.0.0

backend project

- annotation
  - create new annotation
  - deletes the annotation specified by the id
  - returns the annotation specified by the id
  - lists the annotations filtered by creator, target_creator, target_source
- auth
  - login
  - logout
  - signup
- chat
  - create new message for username
  - general chat history
  - chat history with username
- language
  - return all exercise of type
  - return the exercise
  - return recommendation
  - evaluate the exercise
  - returns available languages
  - evaluates level determination exam
  - returns level determination exam questions
- search
  - search
- user
  - returns exercise progress
  - returns language progress

annotation

create new annotation

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This endpoint takes an annotation in the W3C Web Annotation Data Model format (https://www.w3.org/TR/annotation-model/) and saves it to the database

```
POST /api/annotation
```

Request body(JSON) Parameters

Name	Type	Description
annotation	`Object`	(see W3C Web Annotation Data Model for details)
annotation.type	`String`	
annotation.body	`Object`	
annotation.target	`Object`	
annotation.motivation	`Object`	

Success 200

Name	Type	Description
id	`String`	

deletes the annotation specified by the id

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This endpoint deletes the annotation specified by the id

```
DELETE /api/annotation/:id
```

Request Param Parameters

Name	Type	Description
id	`String`	

returns the annotation specified by the id

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This endpoint returns the annotation specified by the id in the W3C Web Annotation Data Model format (https://www.w3.org/TR/annotation-model/)

```
GET /api/annotation/:id
```

Request Param Parameters

Name	Type	Description
id	`String`	

body(JSON)

Name	Type	Description
annotation	`Object`	(see W3C Web Annotation Data Model for details)
annotation.type	`String`	
annotation.body	`Object`	
annotation.target	`Object`	
annotation.creator	`Object`	
annotation.motivation	`Object`	

lists the annotations filtered by creator, target_creator, target_source

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This endpoint returns a list of annotations in the W3C Web Annotation Data Model format (https://www.w3.org/TR/annotation-model/) filtered by creator, target_creator, target_source

```
GET /api/annotation
```

Request Query Parameters

Name	Type	Description
creator	`String`	
target_creator	`String`	
target_source	`String`	

body(JSON)

Name	Type	Description
annotation	`Object[]`	(see W3C Web Annotation Data Model for details)
annotation.type	`String`	
annotation.body	`Object`	
annotation.target	`Object`	
annotation.creator	`Object`	

Name	Type	Description
annotation.motivation	`Object`	

auth

login

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```
POST /api/auth/login
```

Request body(JSON) Parameters

Name	Type	Description
id	`String`	username or email of the user.
password	`String`	password of the user.

logout

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```
POST /api/auth/logout
```

signup

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```
POST /api/auth/signup
```

Request body(JSON) Parameters

Name	Type	Description
username	`String`	
email	`String`	
password	`String`	

chat

create new message for username

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```
POST /api/chat/:username
```

Request body(JSON) Parameters

Name	Type	Description
body	`Object`	

Name	Type	Description
body.message	`String`	message text

Success Response

Success-Response:

```
HTTP/1.1 204 OK
```

general chat history

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```
GET /api/chat/
```

Success Response

Success-Response:

```
HTTP/1.1 200 OK
{
  "nb_new_messages": 3,
  "history": [
     {
         "username": "user",
         "last_message": "hello world",
         "nb_new_messages": 1,
         "last_message_date": "2013-10-21T13:28:06.419Z"
     },
     {
         "username": "admin",
         "last_message": "welcome to bulingo",
         "nb_new_messages": 2,
         "last_message_date": "2013-10-20T11:10:04.222Z"
     }
  ]
}
```

Success 200

Name	Type	Description
chat	`Object`	chat
chat.nb_new_messages	`Integer`	number of new messages (all)
chat.history	`Object[]`	chat history with all users (ordered by date)
chat.history.username	`String`	username
chat.history.last_message	`String`	last message
chat.history.nb_new_messages	`Integer`	number of new messages from that user
chat.history.last_message_date	`String`	date of the last message

chat history with username

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```
GET /api/chat/:username
```

URL Parameters

Name	Type	Description
username	`String`	opponent user's username
skip	`String`	number of messages to skip
limit	`String`	number of messages to return

Success 200

Name	Type	Description
messages	`Object[]`	list of messages
messages.to_username	`String`	message receiver
messages.from_username	`String`	message sender
messages.message	`String`	message text
messages.new	`Boolean`	message is read boolean

language

return all exercise of type

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```
GET /api/language/:language_abbr/exercise
```

Success 200

Name	Type	Description
exercise	`Object[]`	exercises
exercise.exersice_id	`Integer`	exercise id
exercise.title	`String`	exercise title
exercise.language_abbr	`String`	exercise language abbreviation
exercise.exercise_type	`Stirng`	exercise exercise type
exercise.level	`String`	exercise level
exercise.tags	`String`	exercise tags

return the exercise

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```
GET /api/language/:language_abbr/exercise/:exersice_id/questions
```

Request body(JSON)

Name	Type	Description
question_id	`String`	question id
desc	`String`	question description
media_url	`String`	media url related to question (optional)
media_type	`String`	media type related to question (optional)
media_start_time	`String`	media start time related to question (optional)
media_end_time	`String`	media end time related to question (optional)
choices	`Object[]`	answer choices (optional: not available for writing)
choices.id	`String`	choice id
choices.desc	`String`	choice description

return recommendation

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```
GET /api/language/:language_abbr/recommendation/:id
```

Request body(JSON)

Name	Type	Description
recommendation	`Object[]`	
recommendation.username	`String`	username
recommendation.rating	`String`	rating
recommendation.grade	`String`	grade

evaluate the exercise

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```
POST /api/language/:language_abbr/exercise/:exersice_id/evaluate
```

Parameter Parameters

Name	Type	Description
answers	`Object[]`	

Name	Type	Description
answers.question_id	`Integer`	answer question id
answers.choice_id	`Integer`	answer choice id
answers.text	`String`	(optional: only available for writing)

Success 200

Name	Type	Description
nb_correct_answers	`Integer`	number of correct answers
nb_questions	`Integer`	number of questions
answers	`Object[]`	media related to question (e.g. listening material) (optional)
answers.question_id	`Integer`	question id
answers.choice_id	`Integer`	correct choices id

returns available languages

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```
GET /api/language/
```

Success 200

Name	Type	Description
language	`Object[]`	list of languages
language.name	`String`	language name
language.abbr	`String`	language abbreviation

evaluates level determination exam

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```
POST /api/language/:language_abbr/exam/evaluate
```

Request body(JSON) Parameters

Name	Type	Description
answers	`Object[]`	list of answers
answers.question_id	`Integer`	question id
answers.choices_id	`Integer`	choices id

Success 200

Name	Type	Description
grade	`String`	result of evaluation

returns level determination exam questions

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```
GET /api/language/:language_abbr/exam/questions
```

Success 200

Name	Type	Description
questions	`Object[]`	list of exam questions
questions.id	`Integer`	question id
questions.desc	`String`	question description
questions.choices	`Object[]`	answer choices
questions.choices.id	`Integer`	answer choices id
questions.choices.desc	`String`	answer choices description

search

search

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```
GET /api/search/
```

URL Parameters

Name	Type	Description
text	`String`	text to be searched
type	`String`	what type of data to be searched (exercise/user)
lang_abbr	`String`	lang_abbr (exercise)
level	`String`	level (exercise)
exercise_type	`String`	exercise_type (exercise)

Success 200

Name	Type	Description

Name	Type	Description
result	`Object[]`	result array
result.type	`String`	type of data
result.username	`String`	username of the user (optional: only for user type)
result.exersice_id	`Integer`	id of the exercise (optional: only for exercise)
result.title	`String`	title of the exercise (optional: only for exercise)
result.lang_abbr	`String`	language of the exercise (optional: only for exercise)
result.exercises_type	`String`	type of the exercise (optional: only for exercise)
result.level	`Integer`	level of the exercise (optional: only for exercise)
result.tags	`String`	tags of the exercise (optional: only for exercise)

user

returns exercise progress

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```
GET /api/user/:username/exercise/:exercise_id/progress
```

Success 200

Name	Type	Description
username	`String`	username of user
exercise_id	`Integer`	exercise id
question_done	`Integer`	number of questions answered correctly
questions	`Integer`	number of all questions
updatedAt	`String`	last created or updated time

returns language progress

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```
GET /api/user/:username/language/:language_abbr/progress
```

Success 200

Name	Type	Description
username	`String`	username of user

Name	Type	Description
lang_abbr	`String`	language abbreviation
exercise_done	`Integer`	number of completed exercises
exercises	`Integer`	number of all exercises
updatedAt	`String`	last created or updated time

get language radar data

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```
GET /:username/language/:language_abbr/radar
```

Success 200

Name	Type	Description
radar	`Object`	
radar.listening	`Integer`	listening point (over 100)
radar.reading	`Integer`	reading point (over 100)
radar.grammer	`Integer`	grammer point (over 100)
radar.vocabulary	`Integer`	vocabulary point (over 100)
radar.writing	`Integer`	writing point (over 100)

create comment for username

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```
POST /api/user/:username/comments/
```

Request body(JSON) Parameters

Name	Type	Description
comment	`Object`	
comment.text	`String`	text
comment.rating	`Integer`	rating (1,2,3,4,5)

Success Response

Success-Response:

```
HTTP/1.1 204 OK
```

returns all users

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```
GET /api/user/
```

Success 200

Name	Type	Description
user	`Object`	user object
user.username	`String`	username

returns user details

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```
GET /api/user/:username
```

Success 200

Name	Type	Description
user	`Object`	user object
user.username	`String`	username
user.email	`String`	email
user.bio	`String`	biography text
user.avatar	`String`	avatar url
user.rating	`Float`	rating from comments

update user details

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```
POST /api/user/:username
```

Request body(JSON) Parameters

Name	Type	Description
user	`Object`	user object
user.bio	`String`	biography text
user.avatar	`File`	avatar image file

returns user comments

Back to top

```
GET /api/user/:username/comments
```

Success 200

Name	Type	Description
comments	`Object[]`	comments
comments.text	`String`	comment text
comments.rating	`String`	comment rating
comments.comment_by	`String`	author of comment
comments.comment_to	`String`	target of comment
comments.createdAt	`String`	creation time of comment

returns user language level details

Back to top

```
GET /api/user/:username/language/level
```

Success 200

Name	Type	Description
language_levels	`Object[]`	language levels
language_levels.lang_abbr	`String`	language abbr
language_levels.grade	`String`	language level

writing

save writing

Back to top

```
POST /api/writing/
```

Request body Parameters

Name	Type	Description
writing	`Object`	
writing.text	`String`	
writing.image	`File`	
writing.lang_abbr	`String`	
writing.title	`String`	(optional)

Name	Type	Description
writing.assignee	`String`	assignee username (optional)

Success Response

Success-Response:

```
HTTP/1.1 204 OK
```

get writing by id

Back to top

```
GET /api/writing/:id
```

Success Response

Success-Response:

```
HTTP/1.1 200 OK
```

Success 200

Name	Type	Description
writing	`Object`	writing
writing.writing_id	`Integer`	writing id
writing.title	`String`	title
writing.text	`String`	text
writing.image	`String`	image
writing.lang_abbr	`String`	lang_abbr
writing.written_by	`String`	author of writing
writing.assignee	`String`	assignee

list writing

Back to top

```
GET /api/writing/
```

Success Response

Success-Response:

```
HTTP/1.1 200 OK
```

Success 200

Name	Type	Description
writings	`Object[]`	writings
writings.writing_id	`Integer`	writing id
writings.title	`String`	title
writings.text	`String`	text
writings.image	`String`	image
writings.lang_abbr	`String`	lang_abbr
writings.written_by	`String`	author of writing
writings.assignee	`String`	assignee

set assignee

Back to top

```
PUT /api/writing/:id/assignee/:assignee_username
```

Success Response

Success-Response:

```
HTTP/1.1 204 OK
```

7) Requirements

Glossary

- **Registered User:** a registered person whose purpose is to learn and/or to provide skill or knowledge in one or more languages
- **Guest User:** a person who have not logged in or registered yet
- **Admin:** a person whose purpose is to keep the platform intact
- **The platform:** the product with its whole functionality
- **Web Application:** a software which provides a user interface to browse the content on a Web Browser
- **Android Application:** a software which provides a user interface to browse the content on Android Mobile Operating System without using a Web Browser
- **API**: an Application Programming Interface
- **API Application:** a software which provides necessary data to the user interface applications
- **Level**: the difficulty of exercises or the language proficiency level of the user(6 categories : A1-A2-B1-B2-C1-C2 according to CEFR standards.

Requirements

1. Functional Requirements

1.1 User Requirements

1.1.1 Registration and Login

1.1.1.1 Registration

- **1.1.1.1.1** A guest user shall be able register with their e-mail, a unique username and password or continue as a guest user.

1.1.1.2 Login

- **1.1.1.2.1** Registered users log in by entering their username/e-mail and password.

1.1.1.3 Guest User

- **1.1.1.3.1** A guest user shall be able to access limited material, in order to get whole material, he/she must register first.

1.1.2 Multi-Language Selection

A registered user shall be able to choose one or more languages(available languages:English,German)in order to learn or provide expert skill or knowledge.

1.1.3 Access to Materials and Exercises

1.1.3.1 Registered User

- **1.1.3.1.1** A registered user shall be able to access the listening materials according to his/her level.
- **1.1.3.1.2** A registered user shall be able to access the exercises related to the listening materials.
- **1.1.3.1.3** A registered user shall be able to access the reading materials according to his/her level.
- **1.1.3.1.4** A registered user shall be able to access the exercises related to the reading materials.
- **1.1.3.1.5** A registered user shall be able to access the grammar topics according to his/her level
- **1.1.3.1.6** A registered user shall be able to access the exercises related to the grammar materials.
- **1.1.3.1.7** A registered user shall be able to access the vocabulary materials according to his/her level
- **1.1.3.1.8** A registered user shall be able to access the exercises related to the vocabulary materials.
- **1.1.3.1.9** A registered user shall be able to access the writing materials.
- **1.1.3.1.10** A registered user shall be able to access the exercises related to the writing materials.
- **1.1.3.1.11** A registered user shall be able to upload handwritten writing exercises.
- **1.1.3.1.12** A registered user shall be able to do writing exercises by typing in the application.
- **1.1.3.1.13** A registered user shall be able to accept providing writing consultancy to other users.

1.1.3.2 Guest User

- **1.1.3.2.1** A guest user shall be able to access to a directory of all listening exercises of a selected language categorized by language level.
- **1.1.3.2.2** A guest user shall be able to access to a directory of all reading exercises of a selected language categorized by language level.
- **1.1.3.2.3** A guest user shall be able to access to a directory of all grammar exercises of a selected language categorized by language level.
- **1.1.3.2.4** A guest user shall be able to access to a directory of all vocabulary exercises of a selected language categorized by language level.

1.1.4 Customized Access to Materials and Exercises

- **1.1.4.1** A registered user shall be able reach the materials and exercises that are for their current level.
- **1.1.4.2** A registered user shall be able to reach materials and exercises of the lower levels.

1.1.5 Consultancy for Writing Exercises

- **1.1.5.1** A registered user shall be able to choose a user from the recommended list of users or by searching a user by his/her username in order to consult.
- **1.1.5.2** A registered user shall be able to send his/her writing exercises to other users who accept to provide writing consultancy in order to get feedback.

1.1.6 User Profiles

1.1.6.1 Username

Username of a registered user shall be able to seen from the profile of the user.

1.1.6.2 Progress in the languages

Registered users shall be able to see the progress of themselves or other users in the languages in terms of the percentage of correct answers, and the current level.

1.1.6.3 Rating

Registered user's rating in terms of average response time, appreciation by registered users shall be able to seen other users.

1.1.6.4 Avatar

- **1.1.6.4.1** A registered user shall have an avatar.
- **1.1.6.4.2** Registered users shall be able to change their own avatars.

1.1.6.5 Bio

Registered users should be able to add the information about their biography.

1.1.6.6 Guest User

A guest user should have no profile.

1.1.7 Annotation

Registered users shall be able to annotate texts and images within the system.

1.1.8 New Materials

- **1.1.8.1** Registered users in the corresponding language shall be able to upload new learning materials and exercises.
- **1.1.8.2** Newly-added materials shall be evaluated by the admin users.
- **1.1.8.3** Materials which are approved by any admin user shall be integrated into the system.

1.1.9 Messaging

- **1.1.9.1** Registered users shall be able to send a chat request to other users in the corresponding language that user want to learn.
- **1.1.9.2** Registered users shall be able to accept the chat request received from other registered users.
- **1.1.9.3** Registered users shall be able to send text messages to other registered users.
- **1.1.9.4** Registered users shall be able to receive text mes sages from other registered users.

1.1.10 Search

- **1.1.10.1** All registered users shall be able to do a basic search by using keywords.
- **1.1.10.2** Registered users shall be able to do an advanced search to filter the content by topic, difficulty, scope, and tag.

1.1.11 Report Harresment

- **1.1.11.1** Registered users should be able to report disturbing behavioral acts.
- **1.1.11.2** All users should be able to report materials, if they contain racist insults or inappropriate contents.

1.1.12 Commenting

Registered users should be able to make a comment to any user .It will be appended to the commented user’s profile

1.2 System Requirements

1.2.1 Level Determination

1.2.1.1 Level Determination for New Users

The system shall provide a test to new users to determine their level of knowledge about language.

1.2.1.2 Level Determination for Users

The system shall provide a test to registered users after completing all the exercises for their current proficiency level or any arbitrary time that is chosen by the user to determine their new level of knowledge about language.

1.2.2 Automated Grading

- **1.2.2.1** The system shall automatically grade exercises except for writing exercises
- **1.2.2.2** The system shall highlight the correct answer if the provided one by the user is wrong.

1.2.3 User Recommendation

The system shall recommend other users to users to consult for writing according to their proficiency level in the corresponding language.

1.2.4 Progress Statistics

The system shall provide statistics about completed/uncompleted exercises, achievement.

1.2.5 Accepting Consultancy

The system shall provide an option for users to accept if they are willing to provide writing consultancy for other users.

1.2.6 Semantic Searching

The system shall provide a semantic searching mechanism.

1.2.7 Admin

- **1.2.7.1** The system shall have some admins who are responsible of reports and new materials.
- **1.2.7.2** An admin shall evaluate the report that come from the users.
- **1.2.7.3** An admin shall delete the racist or insultive contents that was reported by the users.
- **1.2.7.4** An admin shall evaluate the new materials that are added by users and shall accept or reject the material to be integrated to the system.

2. Nonfunctional Requirements

2.1 Availability Requirements

The platform and the materials should be accessible at any time, from anywhere.

2.2 Portability Requirements

2.2.1 Web application

- **2.2.1.1** The Web application shall support Google Chrome 48 and later.
- **2.2.1.2** The Web application should support Google Chrome 32 and later.

2.2.2 Android

- **2.2.2.1** The Android Application shall support Android 6: Marshmallow and later in order to support modern devices.
- **2.2.2.2** The Android Application should support Android 4.4: KitKat and later in order to support older devices.

2.2.3 API

- **2.2.3.1** The API Application shall be deployable on a remote and manually configurable remote server.
- **2.2.3.2** The API Application should be deployed to Amazon EC2 or DigitalOcean remote server.

2.3 Performance Requirements

The system should respond to any request in 5 seconds at most.

2.4 Security Requirements

2.4.1 Encryption

The system should encrypt the traffic by using HTTPS.

2.4.2 Password

The system should force the users to pick at least six characters long password.

2.5 Privacy Requirements

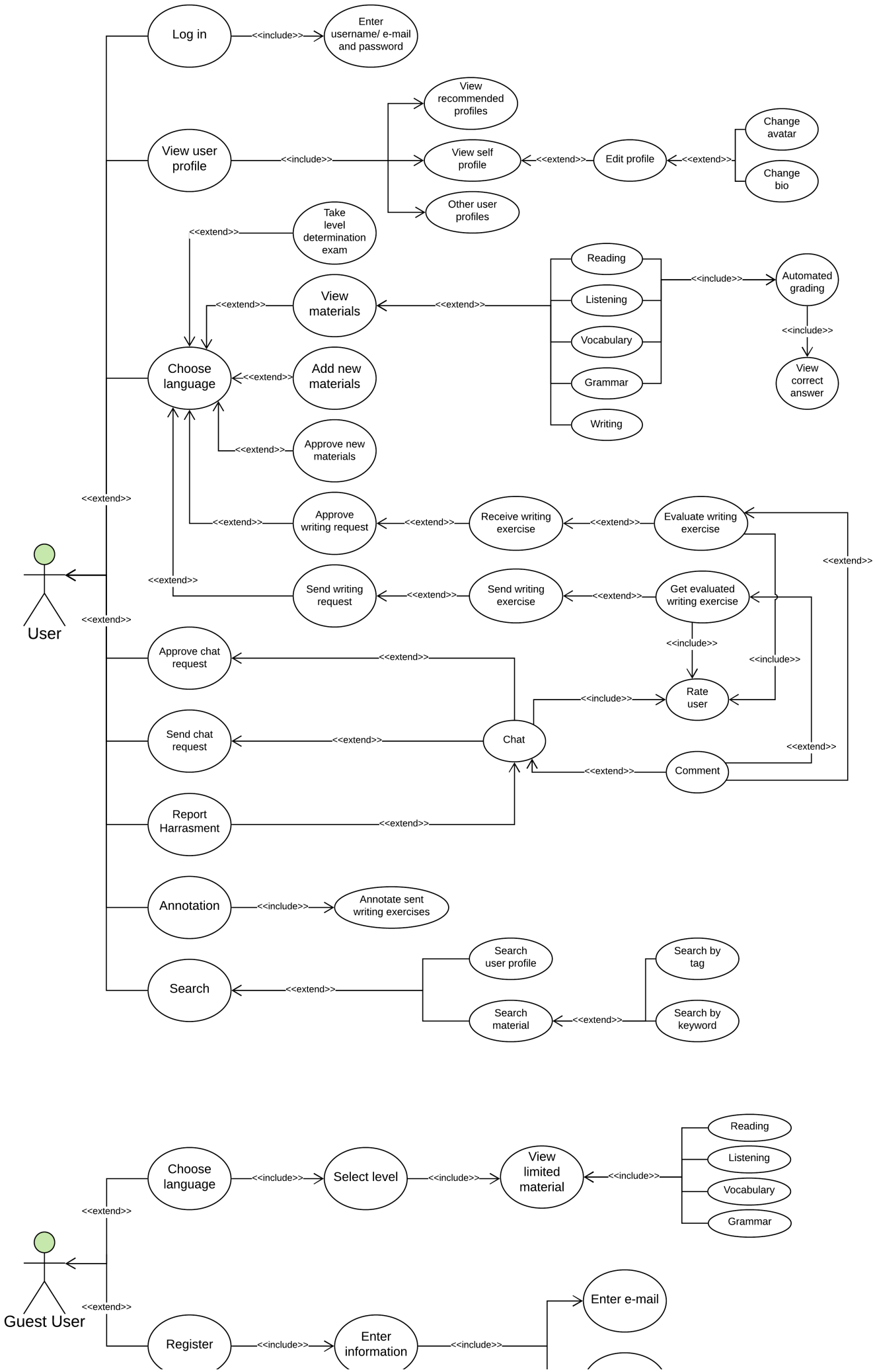
The personal information, contact information, copyrighted contents, license issues and everything related to these paradigms shall be respected and considered.

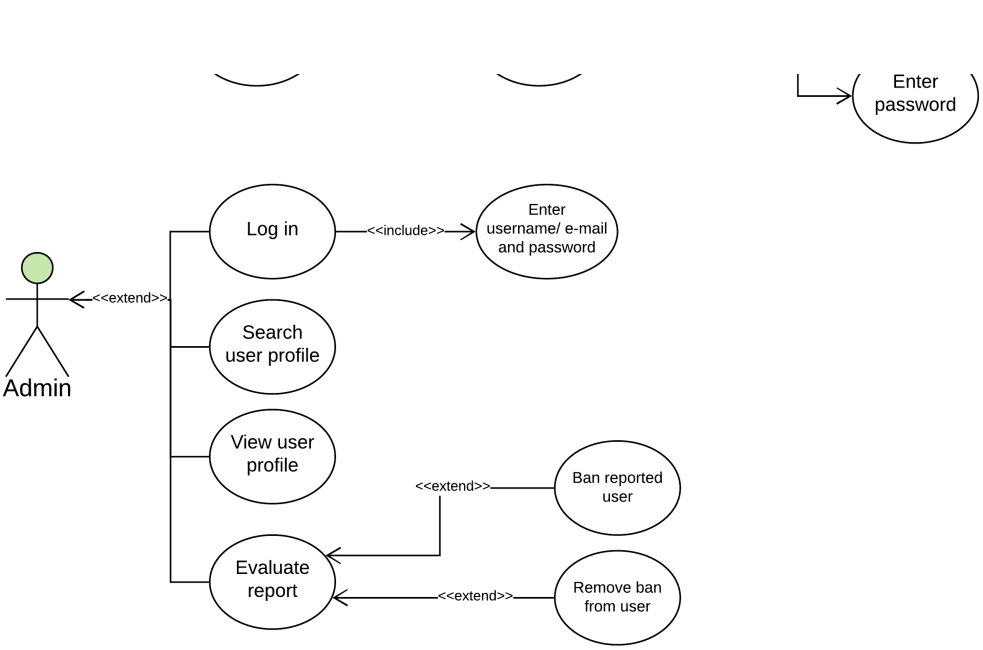
2.6 Standards

- **2.6.1** W3C Web Annotation Data Model shall be used for Annotation.
- **2.6.2** The implementation of this system shall follow the standards introduced by the World Wide Web Consortium (W3C).

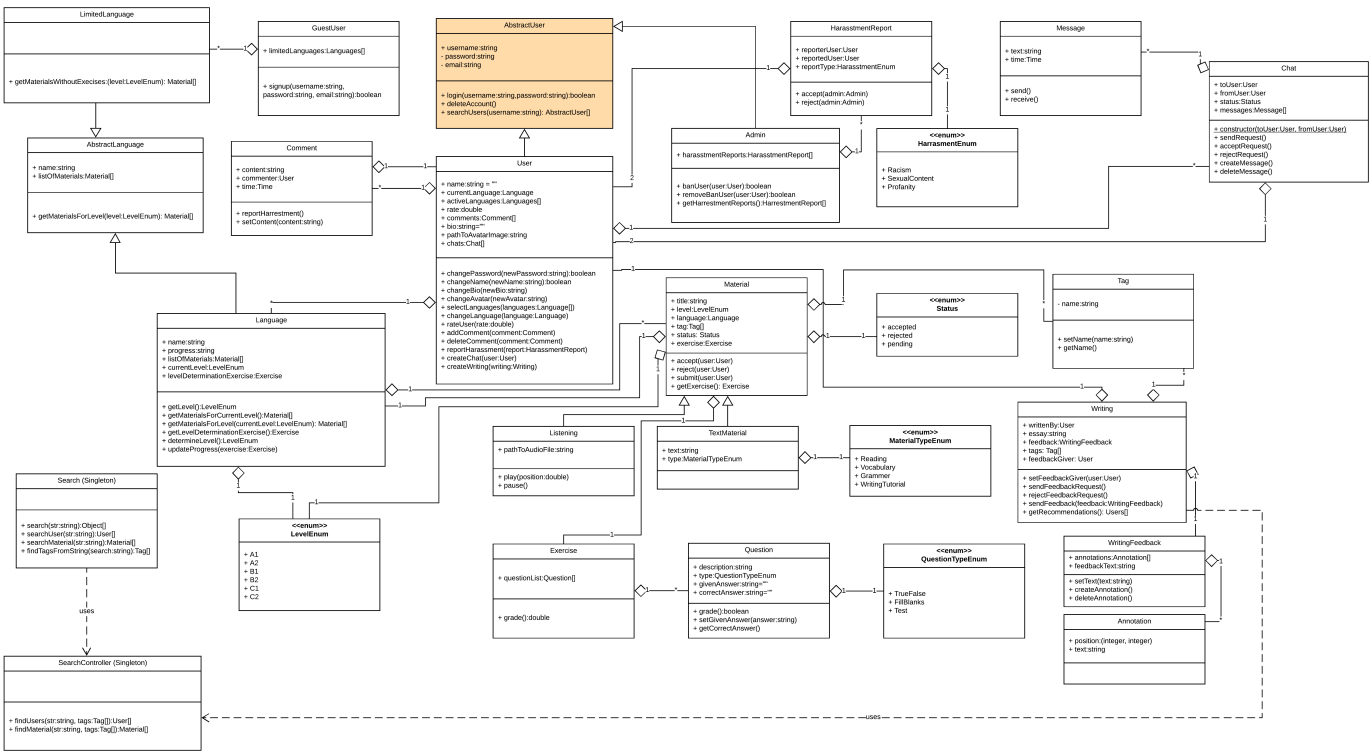
8) Design Documents

8.1) Use Case Diagram


Log in
<<include>>
Enter username/ e-mail and password
View user profile
View recommended profiles
View self profile
Other user profiles
<<extend>>
Edit profile
Change avatar
Change bio
Take level determination exam
View materials
Reading
Listening
Vocabulary
Grammar
Writing
Automated grading
View correct answer
Choose language
Add new materials
Approve new materials
Approve writing request
Receive writing exercise
Evaluate writing exercise
Send writing request
Send writing exercise
Get evaluated writing exercise
User
Approve chat request
Send chat request
Report Harrasment
Chat
Rate user
Comment
Annotation
Annotate sent writing exercises
Search
Search user profile
Search material
Search by tag
Search by keyword
Guest User
Select level
View limited material
Register
Enter information
Enter e-mail

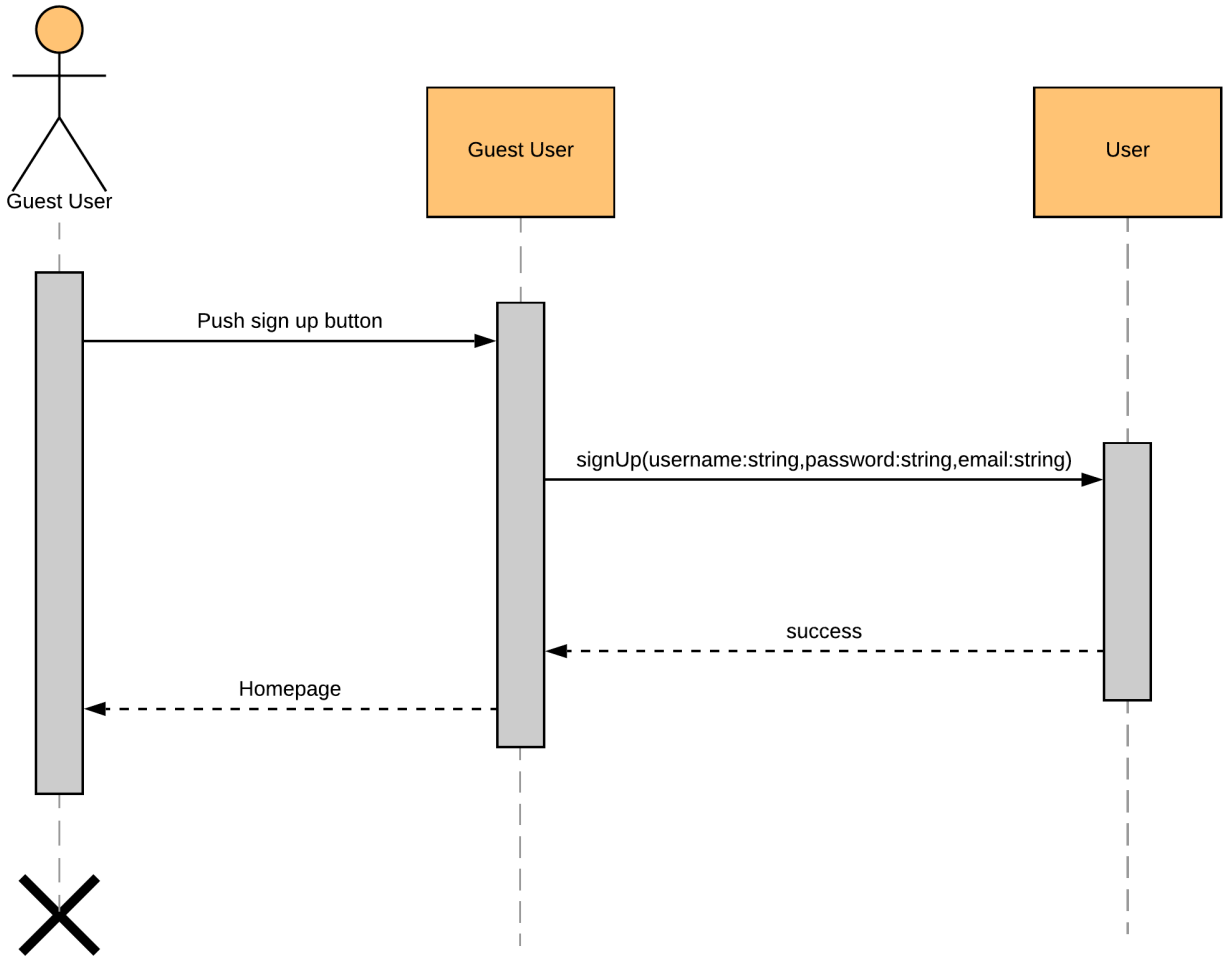


8.2) Class Diagram

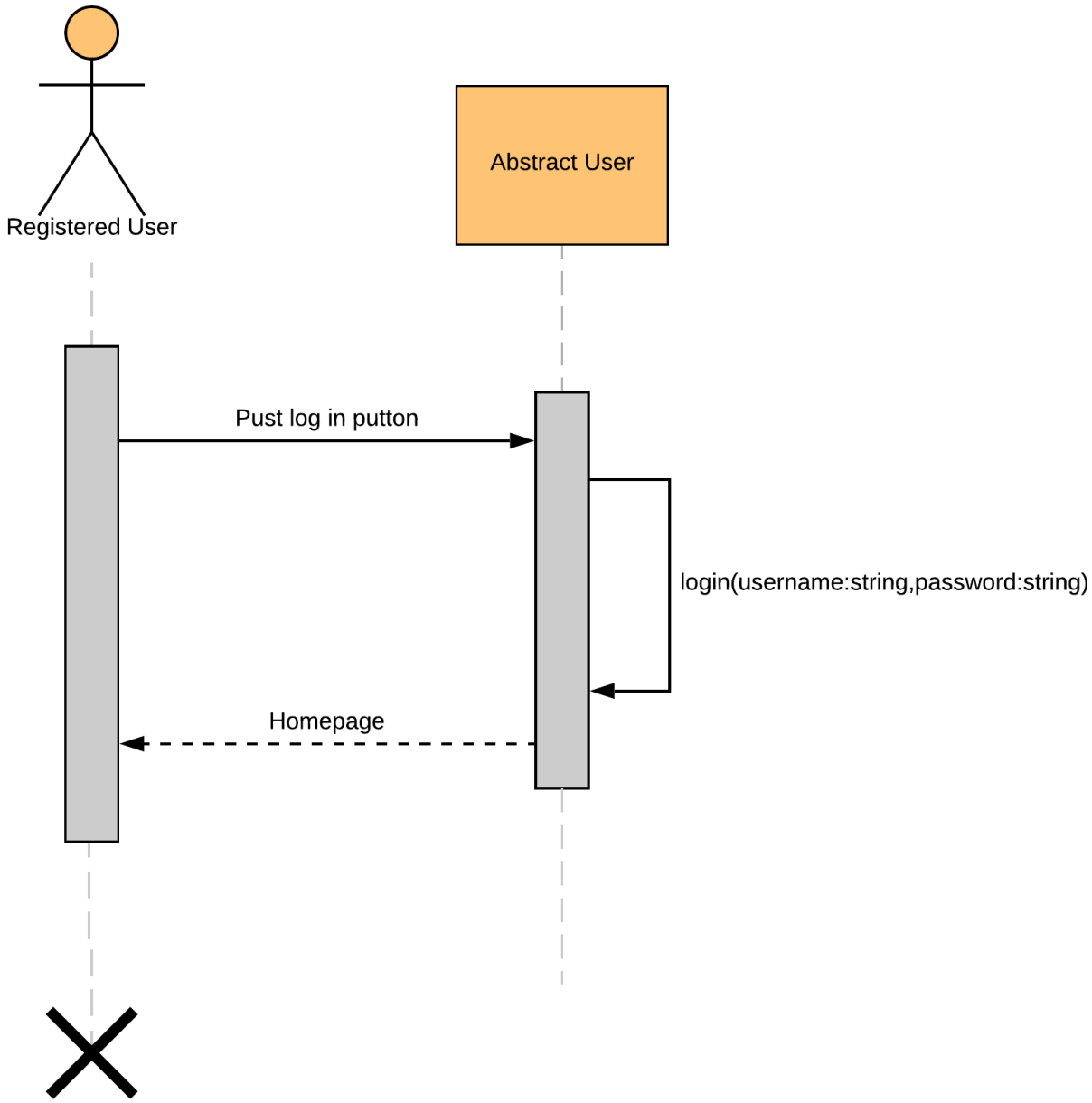


8.3) Sequence Diagrams

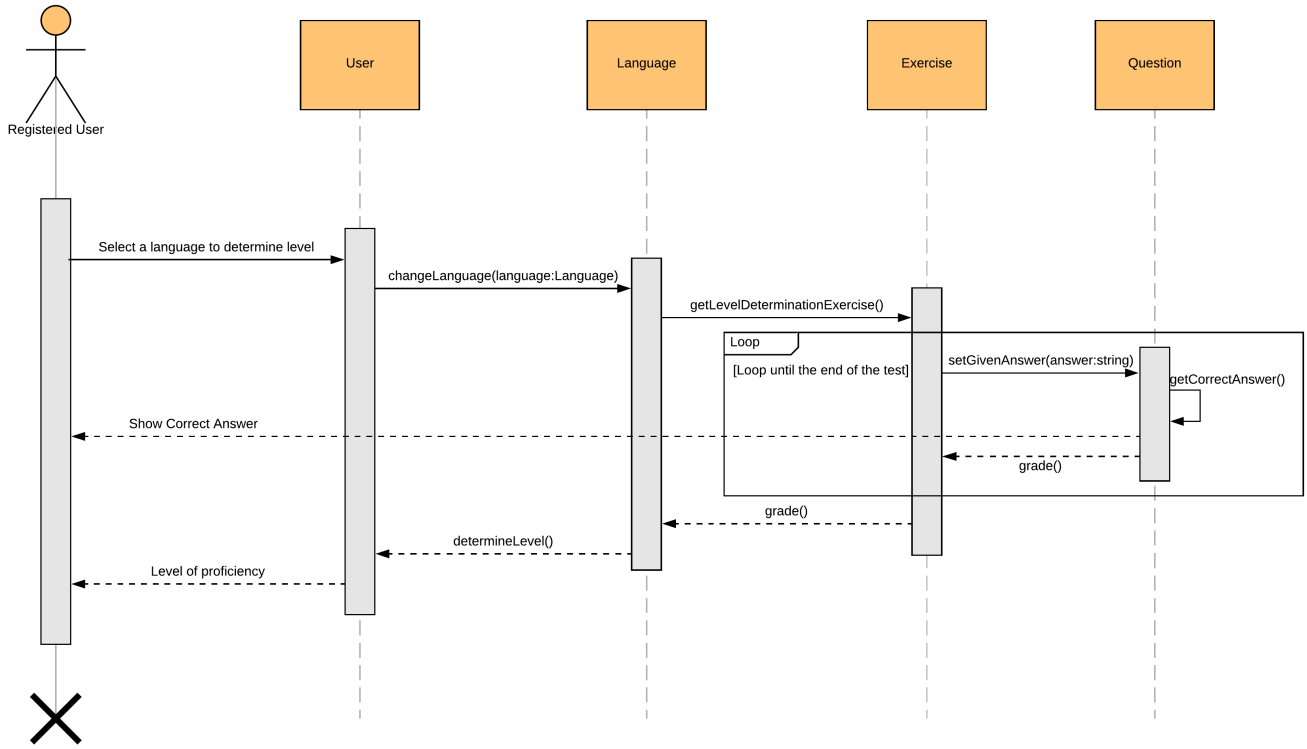
8.3.1) Sign Up


Guest User
Guest User
User
Push sign up button
signUp(username:string,password:string,email:string)
success
Homepage

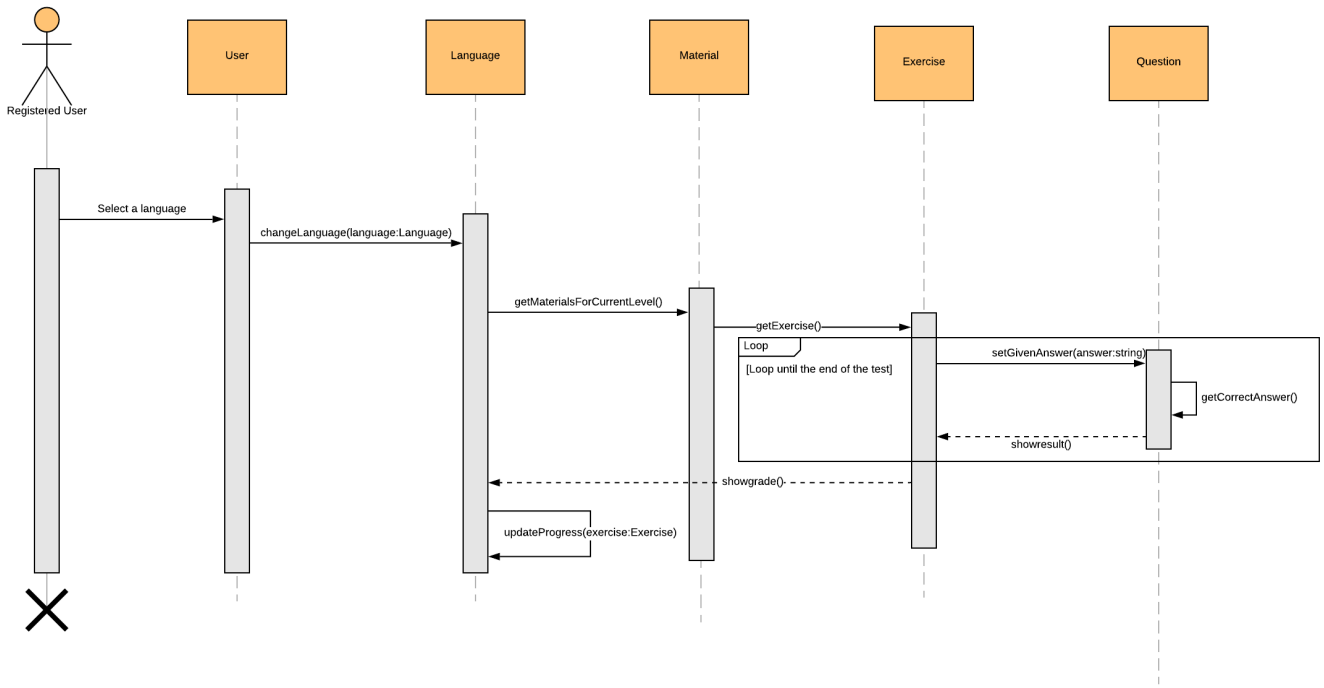
8.3.2) Login



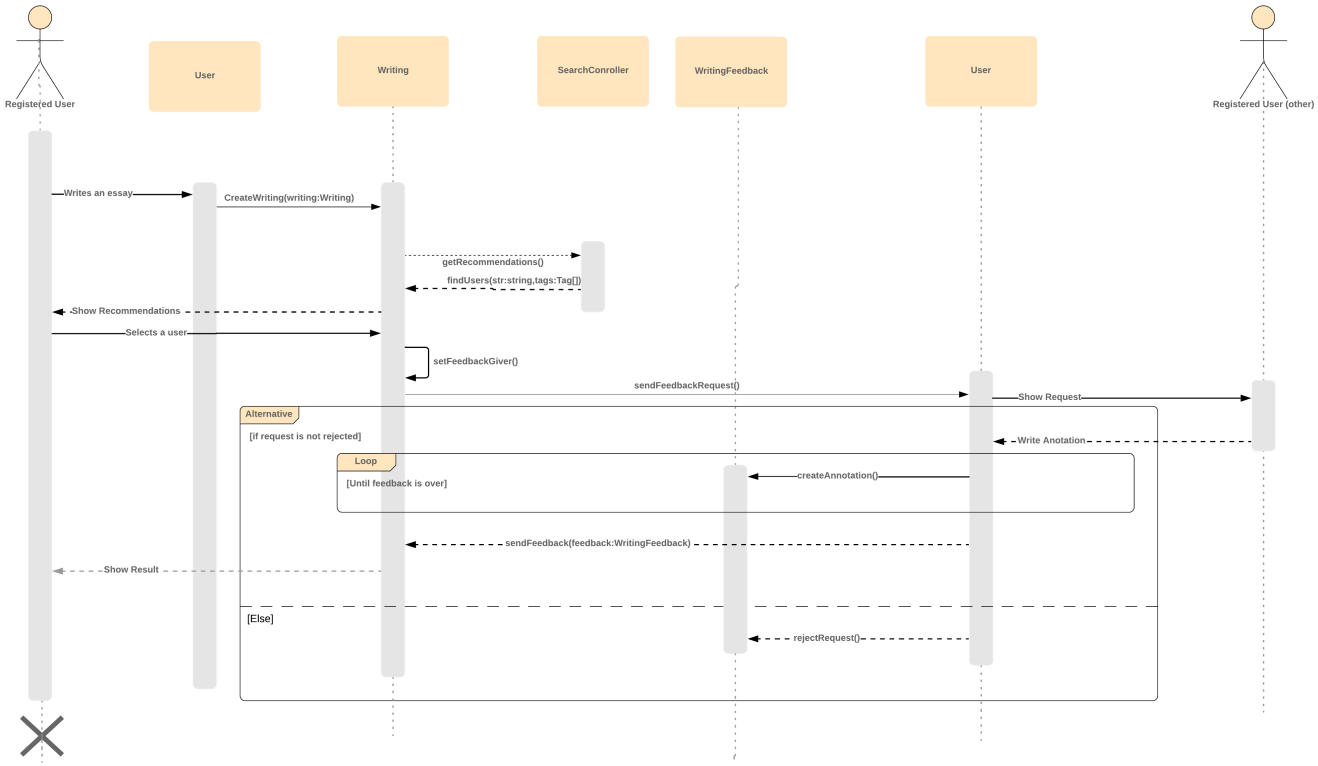
8.3.3) Level Determination



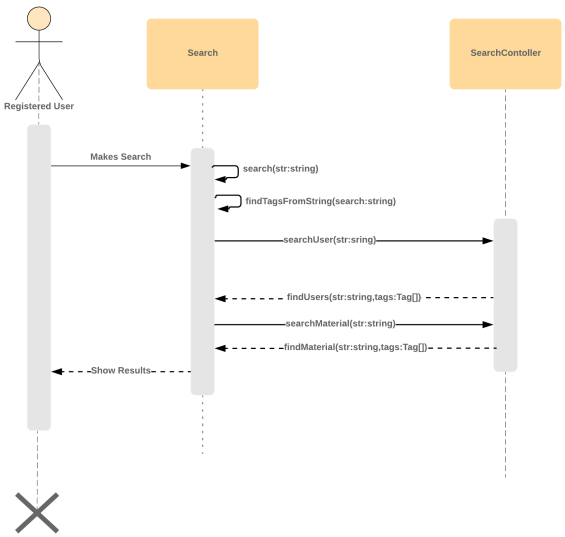
8.3.4) Use Language Materials



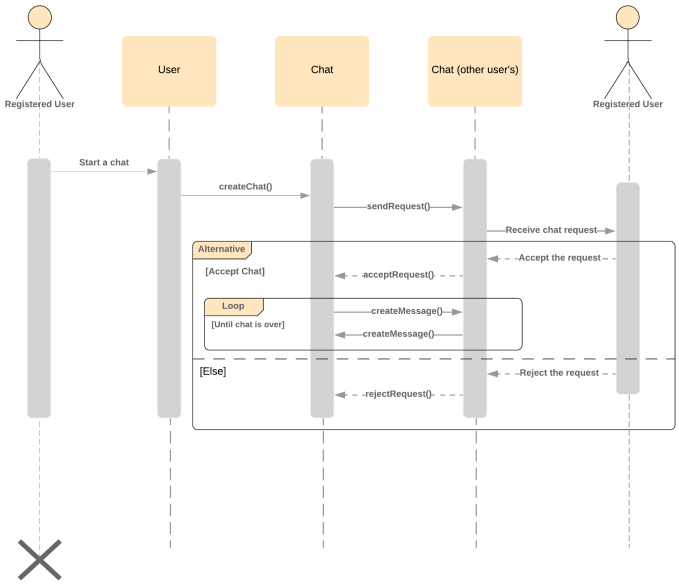
8.3.5) Writing and Annotation



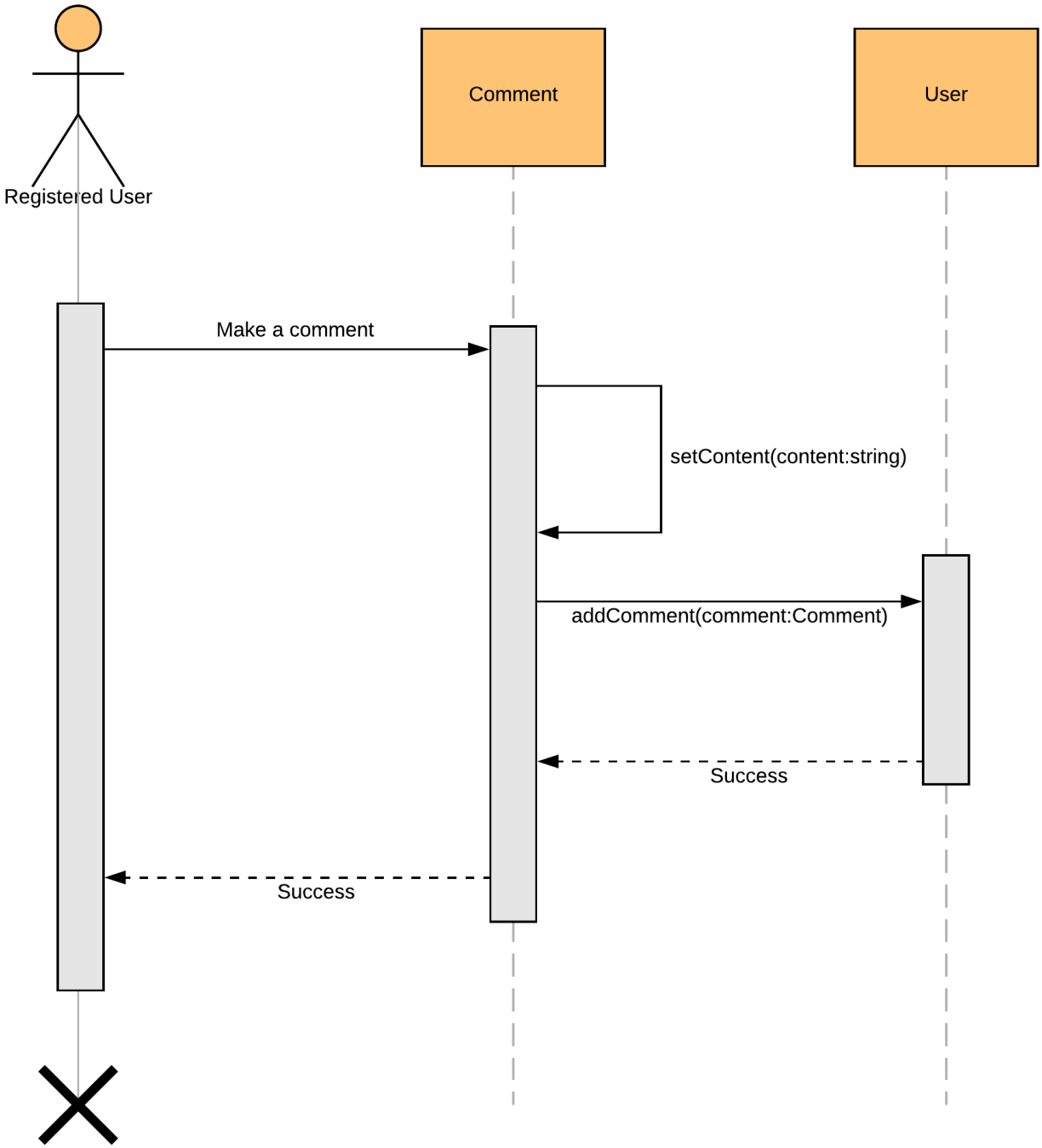
8.3.6) Search



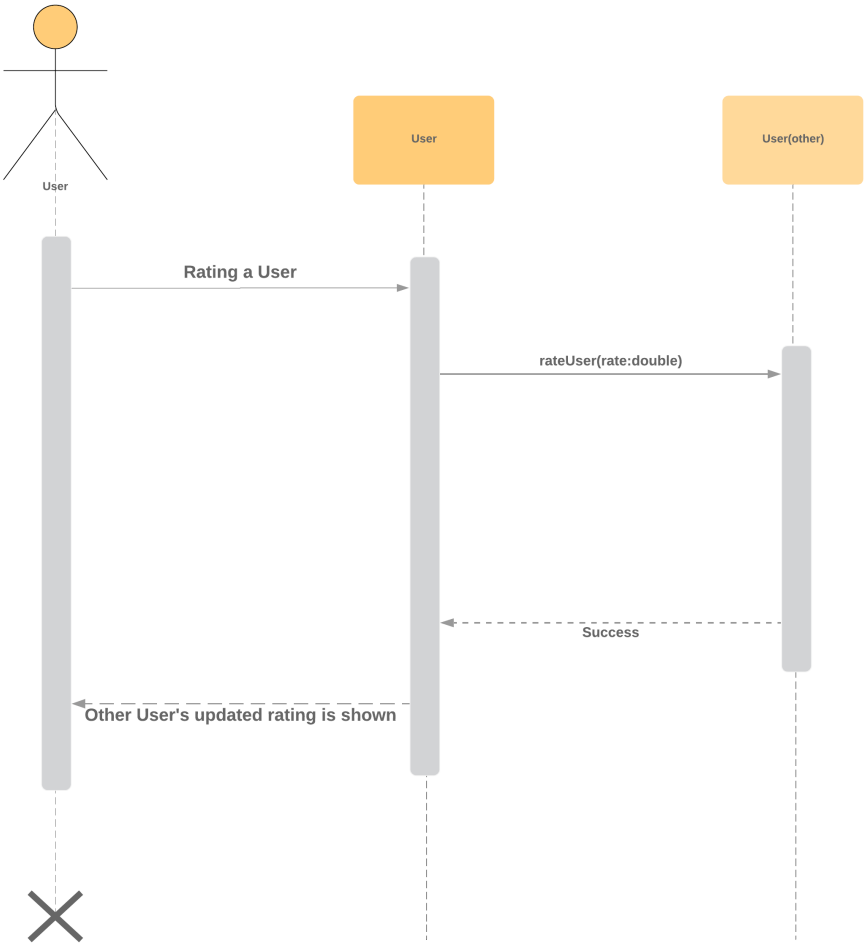
8.3.7) Chat


Registered User
User
Chat
Chat (other user's)
Registered User
Start a chat
createChat()
sendRequest()
Receive chat request
Alternative
[Accept Chat]
Accept the request
acceptRequest()
Loop
[Until chat is over]
createMessage()
createMessage()
[Else]
Reject the request
rejectRequest()

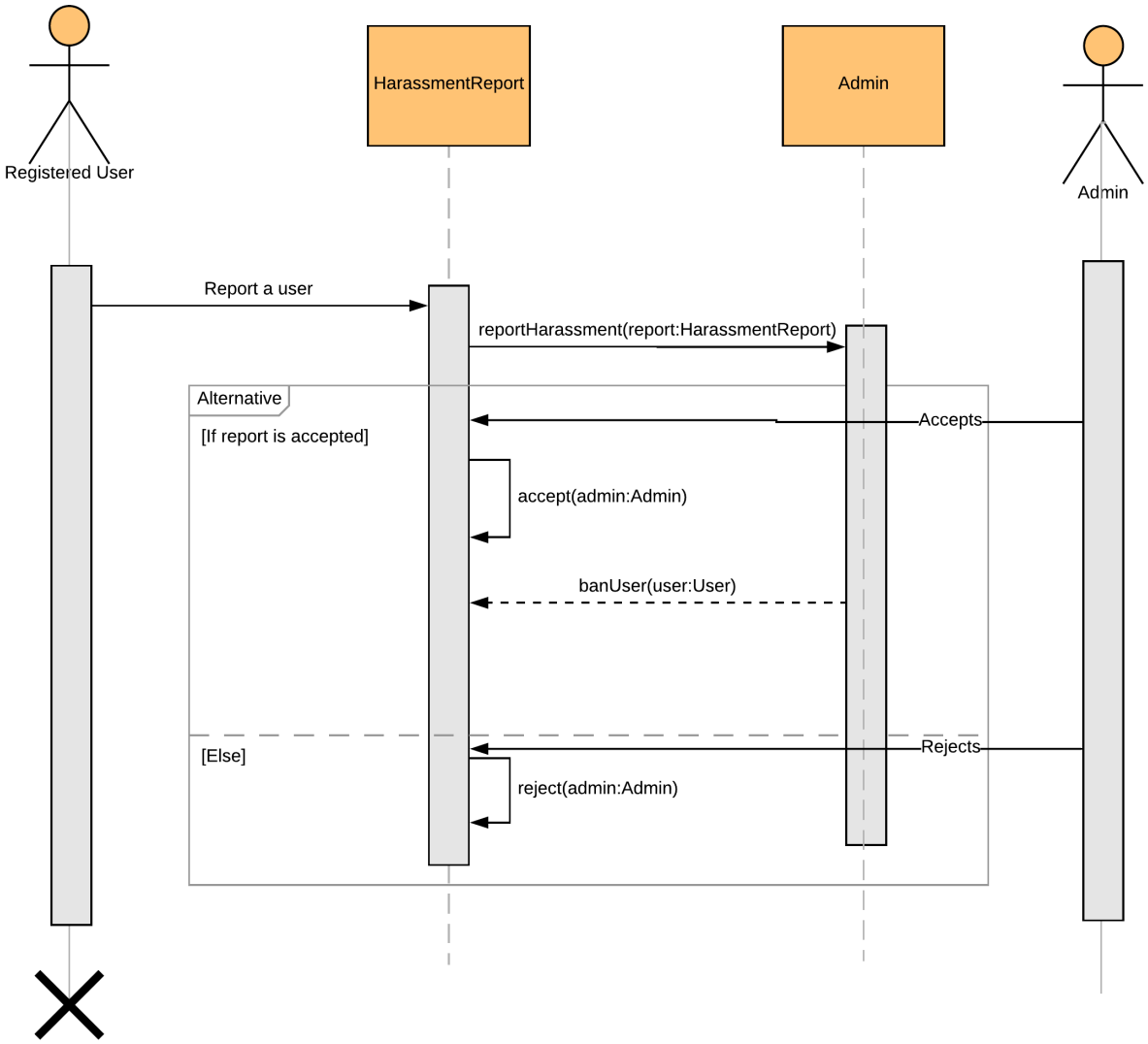
8.3.8) Comment


Registered User
Comment
User
Make a comment
setContent(content:string)
addComment(comment:Comment)
Success
Success

8.3.9) Rate



8.3.10) Report Harassment



8.4) Mockups

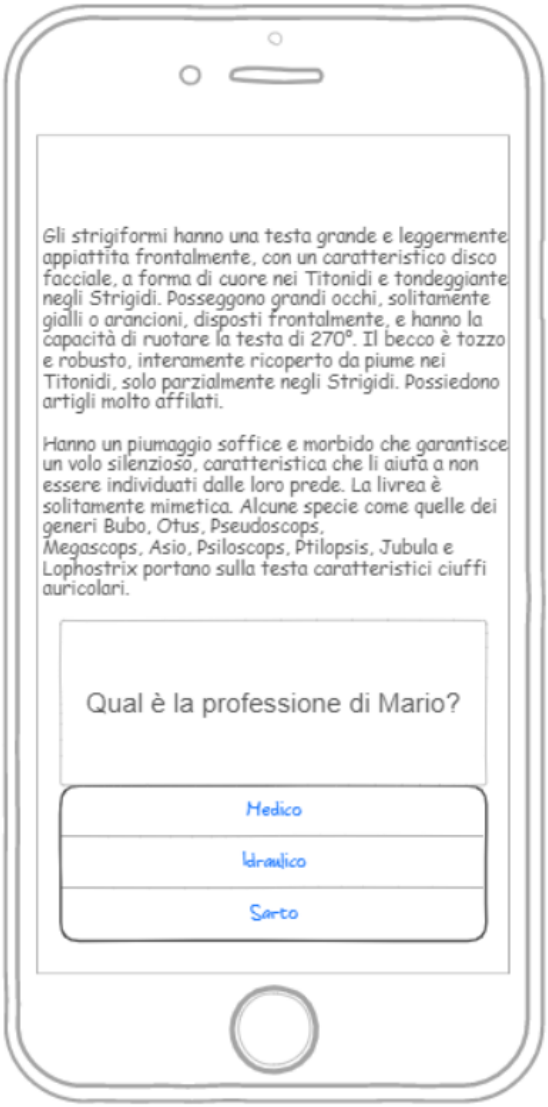
8.4.1) Scenario 1

Preconditions:

- User has registered
- User has chosen Italian to work on.

Esra wants to work on vocabulary because if she knows the words of Italian, she can understand most of the sentences without knowing the grammar. She wants to work on reading materials also. If she gets used to Italian readings, she can work on Italian articles to enlarge her horizon. Apex Linguage provides best experience, that is why she chooses Apex Linguage.

Esra practices with flashcards, in that way she can learn new words easily.



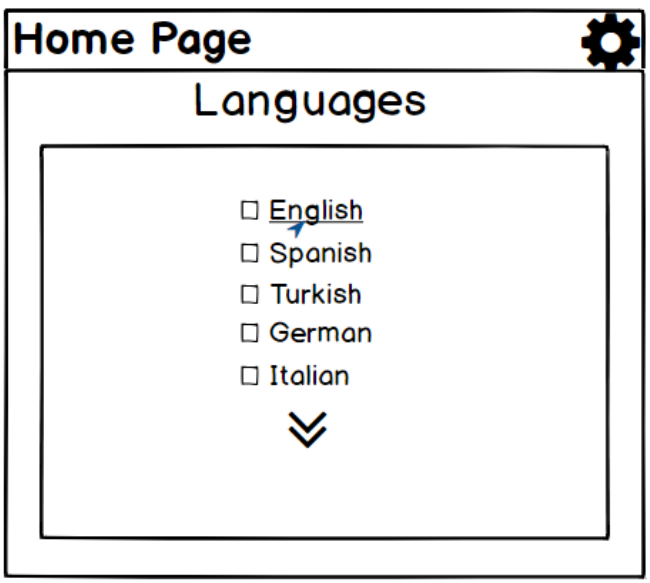
She reads readings and answers questions based on the reading

8.4.2) Scenario 2

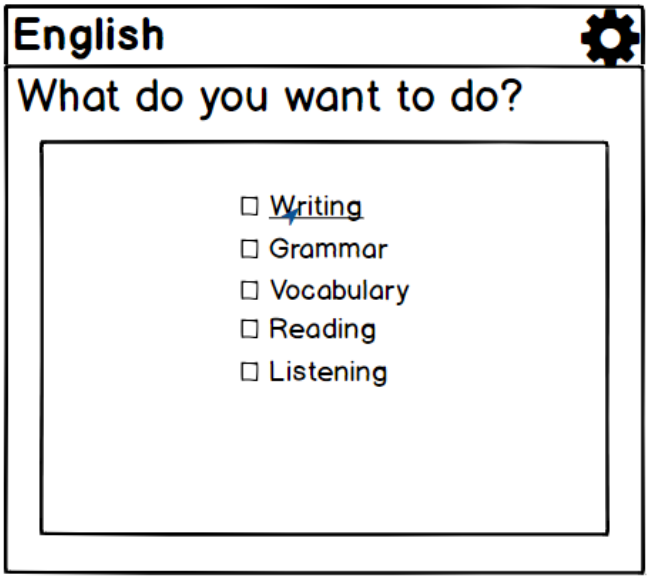
Precondition

- User has registered

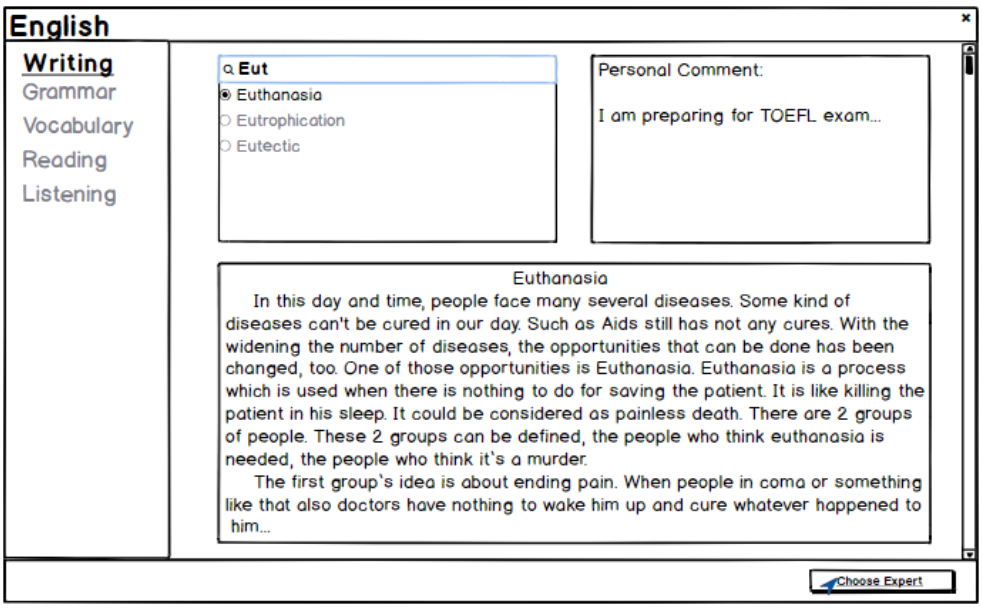
Cihat makes some minor mistakes in his essays and he wants to get rid of them. These minor mistakes makes him feel unconfortable, and might cause a failure on TOEFL exam. He prefers our program because we provide direct interaction between user and expert.



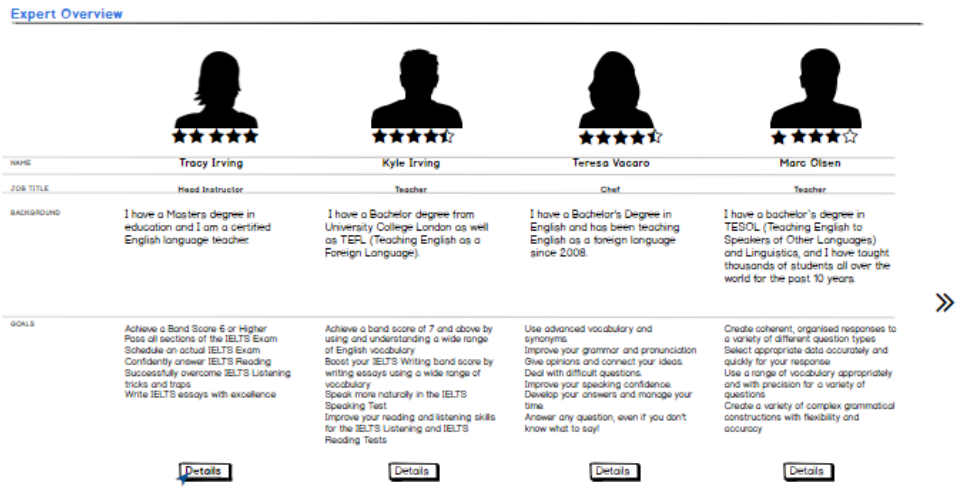
Chooses which language he/she wants to work on.



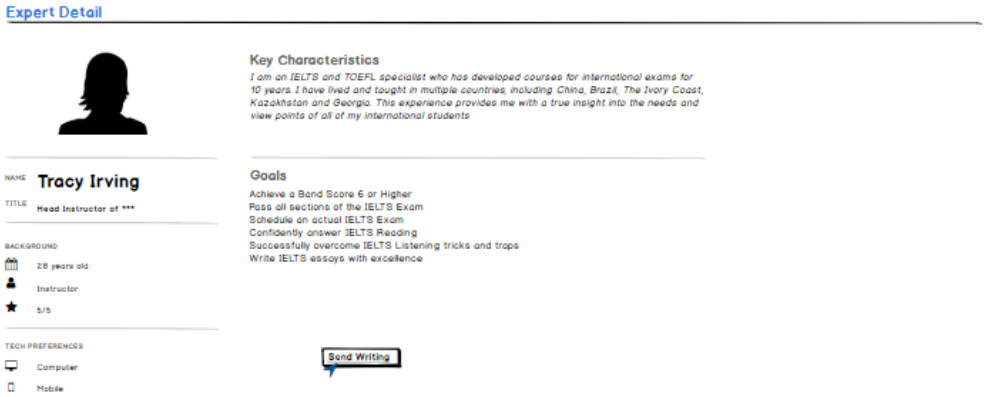
Chooses which course type he/she wants to work on.



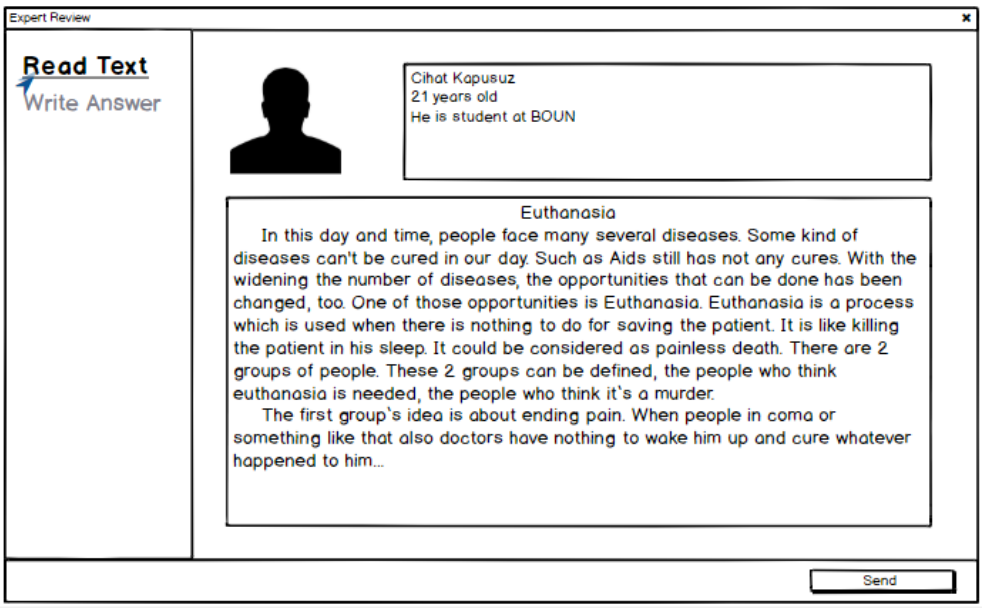
Writes an essay for his/her preparation about TOEFL exam.



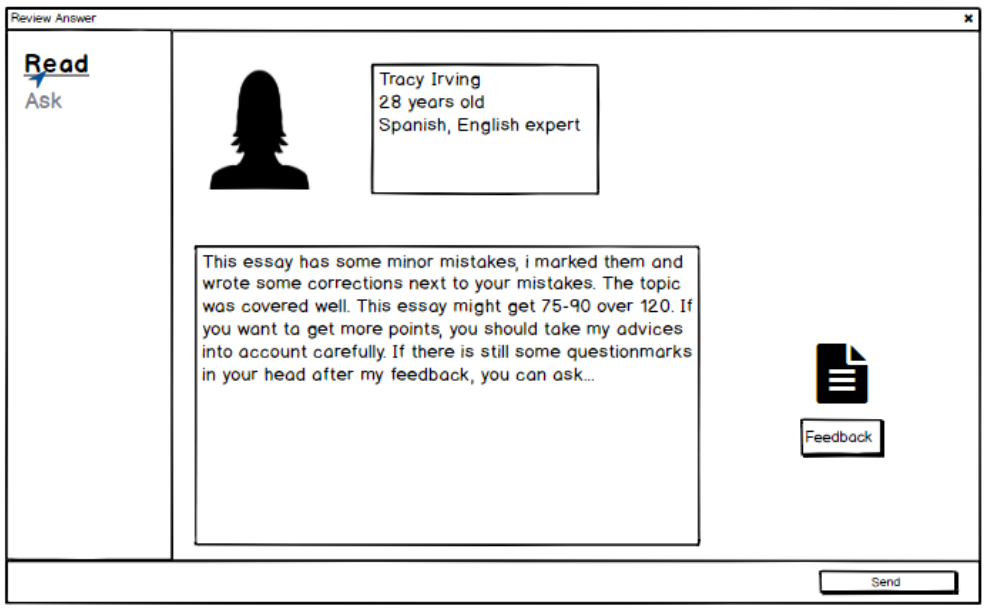
Chooses an expert from the expert pool to send his/her essay.



Gains detailed information about the expert before sending his/her essay.



Expert reads the essay then gives the feedback.



Reads the given feedback from the expert.

8.4.3) Scenario 3

Preconditions

- Mert already has a registered account.
- He took a level determination test and placed in his appropriate level.

Mert Kara is a freshman student and studying Computer Engineering. He has a decent English, but he wants to learn French since he wants to work in France in the future. He uses his smartphone to learn French while he uses Metrobus everyday to go to his school. He is mostly interested in vocabulary for the time being.

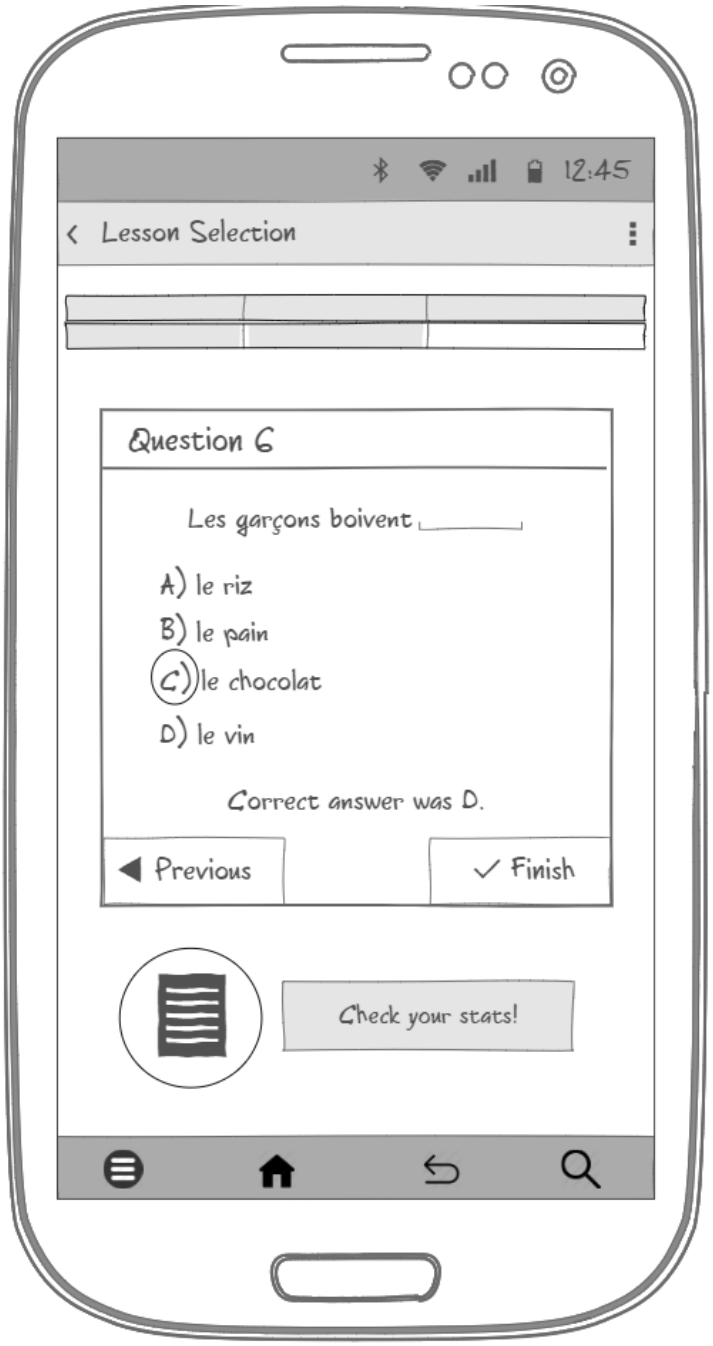
Mockups

1. Mert logs in to his account using his credentials.

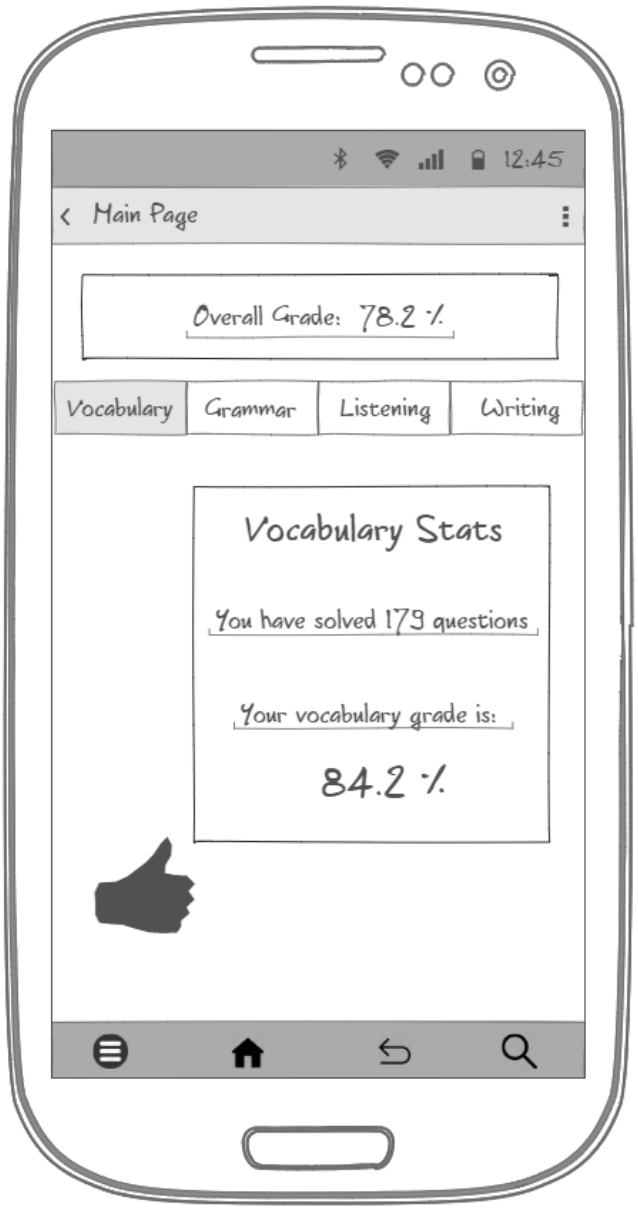
2. Mert chooses to learn French.

3. Mert selects vocabulary exercises to work on.

4. As Mert marks questions, he sees that his answer is wrong. Later he finds out that vine is the only beverage in the choices.



5. Mert finishes the exercise and decides to view his stats.
6. He can see both his overall grade and individual grades for various exercies.



9) System and User Manuals

Run the complete project with Docker Compose

1. System Manual

1.1 Requirements

- Docker
- Docker Compose

1.2 Setup

1. Clone the project from Github Repository.
2. Change directory to the project folder (bounswe2019group3/project)

1.3 Run the project

1. Run the project using the following command:

```
docker-compose up
```

2. Database Setup - Initialize the database from the dump using one of the following commands:

- SQL: `docker exec -it bulingo_database bash -c "psql -U postgres bulingo < /home/db_dump.sql"`
- TAR: `docker exec -it bulingo_database bash -c "pg_restore -d bulingo /home/db_dump.tar -c -U postgres"`

3. Access the applications using the following URLs:

- frontend: http://localhost/
- backend: http://localhost/api
- android: http://localhost/android/app.apk

Frontend

Backend

1. System Manual

1.1 Requirements

- NodeJS 10
- NPM
- PostgreSQL

1.2 Setup

1. Clone the project from Github Repository.
2. Change directory to the backend folder (bounswe2019group3/project/backend)
3. Install dependencies using the following command: `npm install`
4. Start PostgreSQL database server
5. Database Setup - Initialize the database from the dump using one of the following commands:

- SQL: `psql -U postgres bulingo < db_dump.sql`
- TAR `pg_restore -d bulingo db_dump.tar -c -U postgres`

1.3 Run the project

1. Run the following command to start the backend server: `npm start`
2. Access the backend server on http://localhost:3000

Android

1. System Manual

1.1 Requirements

- Android Studio
- Android SDK Tools
- JDK
- Android 6.0 and above (API Level 23)

1.2 Setup

1. Clone the project from Github Repository.
2. Open the source code in Android Studio.
3. Install a virtual device on Android Studio or connect an Android phone.

1.3 Run the project

1. Select a virtual device or connected Android phone in Android Studio.
2. Build and run the project on the selected device.

2. User Manual

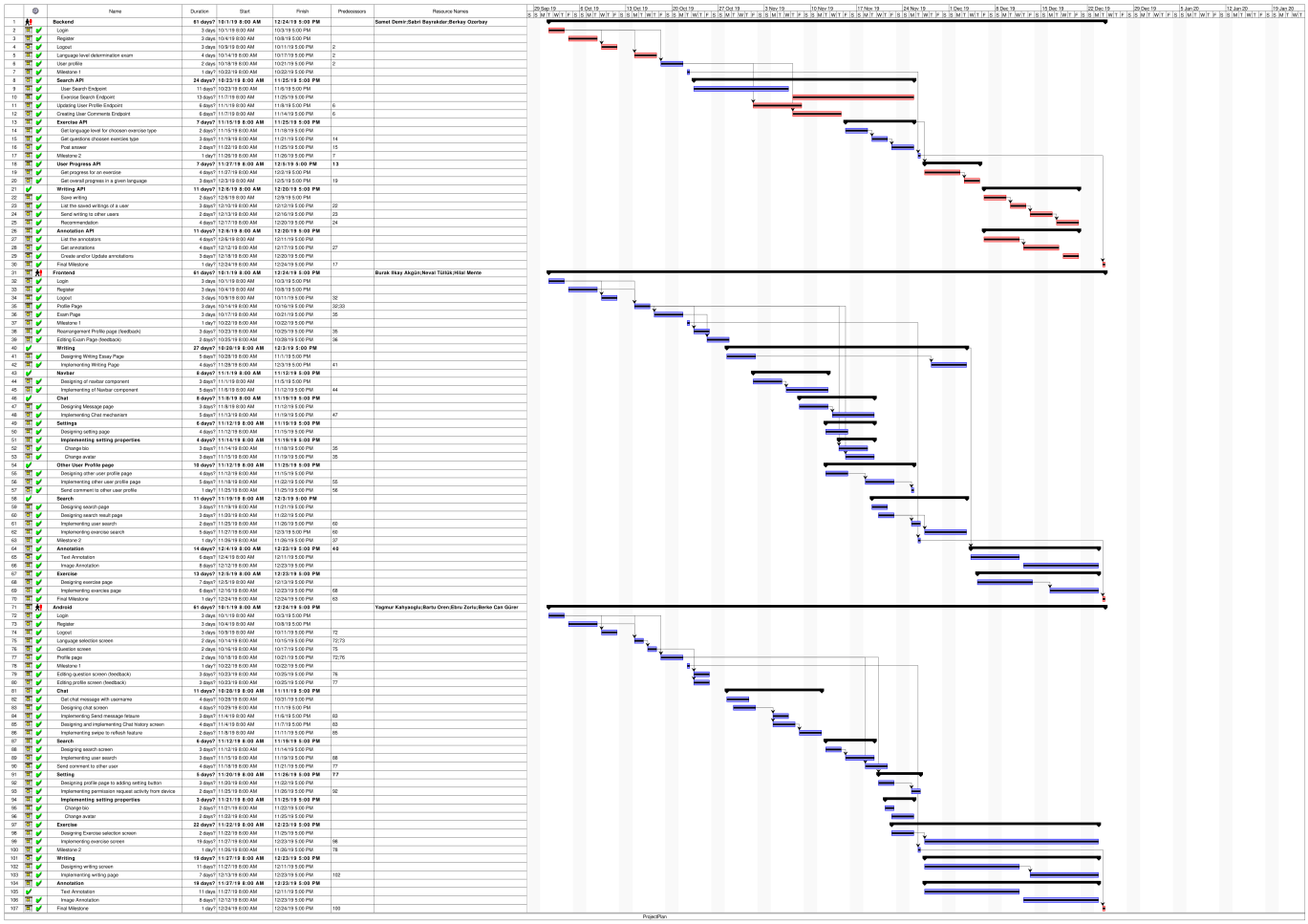
2.1 Requirements

- Android 6.0+
- Internet Connection
- User permissions

2.2 Usage

1. Setup APK file on your Android device.
2. Open the app.
3. Register or login with your existing account.
4. Never stop learning!

10) Project Plan



		Name	Duration	Start	Finish	Predecessors	Resource Names
1		**Backend**	**61 days?**	**10/1/19 8:00 AM**	**12/24/19 5:00 PM**		**Samet Demir;Sabri Baysekdar;Berkay Ozerbay**
2		Login	3 days	10/1/19 8:00 AM	10/3/19 5:00 PM		
3		Register	3 days	10/4/19 8:00 AM	10/8/19 5:00 PM		
4		Logout	3 days	10/9/19 8:00 AM	10/11/19 5:00 PM	2	
5		Language level determination exam	4 days	10/14/19 8:00 AM	10/17/19 5:00 PM	2	
6		User profile	2 days	10/18/19 8:00 AM	10/21/19 5:00 PM	2	
7		Milestone 1	1 day?	10/23/19 8:00 AM	10/23/19 5:00 PM		
8		**Search API**	**24 days?**	**10/23/19 8:00 AM**	**11/25/19 5:00 PM**		
9		User Search Endpoint	11 days?	10/23/19 8:00 AM	11/6/19 5:00 PM		
10		Exercise Search Endpoint	13 days?	11/7/19 8:00 AM	11/25/19 5:00 PM		
11		Updating User Profile Endpoint	4 days?	11/1/19 8:00 AM	11/6/19 5:00 PM	6	
12		Creating User Comments Endpoint	6 days?	11/7/19 8:00 AM	11/14/19 5:00 PM	6	
13		**Exercise API**	**7 days?**	**11/15/19 8:00 AM**	**11/25/19 5:00 PM**		
14		Get language level for chooser exercise type	2 days?	11/15/19 8:00 AM	11/18/19 5:00 PM		
15		Get questions chooser exercies type	3 days?	11/19/19 8:00 AM	11/21/19 5:00 PM	14	
16		Post answer	2 days?	11/22/19 8:00 AM	11/25/19 5:00 PM	15	
17		Milestone 2	1 day?	11/26/19 8:00 AM	11/26/19 5:00 PM	7	
18		**User Progress API**	**7 days?**	**11/27/19 8:00 AM**	**12/5/19 5:00 PM**	**13**	
19		Get progress for an exercise	4 days?	11/27/19 8:00 AM	12/2/19 5:00 PM		
20		Get overall progress in a given language	3 days?	12/3/19 8:00 AM	12/5/19 5:00 PM	19	
21		**Writing API**	**11 days?**	**12/6/19 8:00 AM**	**12/20/19 5:00 PM**		
22		Save writing	2 days?	12/6/19 8:00 AM	12/9/19 5:00 PM		
23		List the saved writings of a user	3 days?	12/10/19 8:00 AM	12/12/19 5:00 PM	22	
24		Send writing to other users	2 days?	12/13/19 8:00 AM	12/16/19 5:00 PM	23	
25		Recommendation	4 days?	12/17/19 8:00 AM	12/20/19 5:00 PM	24	
26		**Annotation API**	**11 days?**	**12/6/19 8:00 AM**	**12/20/19 5:00 PM**		
27		List the annotators	4 days?	12/6/19 8:00 AM	12/11/19 5:00 PM		
28		Get annotations	4 days?	12/12/19 8:00 AM	12/17/19 5:00 PM	27	
29		Create and/or Update annotations	3 days?	12/18/19 8:00 AM	12/20/19 5:00 PM		
30		Final Milestone	1 day?	12/24/19 8:00 AM	12/24/19 5:00 PM	17	
31		**Frontend**	**61 days?**	**10/1/19 8:00 AM**	**12/24/19 5:00 PM**		**Burak Ilkay Akgün;Nevzat Tütüak;Hilal Mente**
32		Login	3 days	10/1/19 8:00 AM	10/3/19 5:00 PM		
33		Register	3 days	10/4/19 8:00 AM	10/8/19 5:00 PM		
34		Logout	3 days	10/9/19 8:00 AM	10/11/19 5:00 PM	32	
35		Profile Page	3 days	10/14/19 8:00 AM	10/16/19 5:00 PM	32;33	
36		Exam Page	3 days	10/17/19 8:00 AM	10/21/19 5:00 PM	35	
37		Milestone 1	1 day?	10/22/19 8:00 AM	10/22/19 5:00 PM		
38		Rearrangement Profile page (feedback)	3 days?	10/23/19 8:00 AM	10/25/19 5:00 PM	35	
39		Editing Exam Page (feedback)	2 days?	10/25/19 8:00 AM	10/28/19 5:00 PM	36	
40		**Writing**	**27 days?**	**10/28/19 8:00 AM**	**12/3/19 5:00 PM**		
41		Designing Writing Essay Page	5 days?	10/28/19 8:00 AM	11/1/19 5:00 PM		
42		Implementing Writing Page	4 days?	11/28/19 8:00 AM	12/3/19 5:00 PM	41	
43		**Navbar**	**6 days?**	**11/1/19 8:00 AM**	**11/12/19 5:00 PM**		
44		Designing of navbar component	3 days?	11/1/19 8:00 AM	11/5/19 5:00 PM		
45		Implementing of Navbar component	5 days?	11/6/19 8:00 AM	11/12/19 5:00 PM	44	
46		**Chat**	**6 days?**	**11/6/19 8:00 AM**	**11/15/19 5:00 PM**		
47		Designing Message page	3 days?	11/6/19 8:00 AM	11/12/19 5:00 PM		
48		Implementing Chat mechanism	5 days?	11/13/19 8:00 AM	11/19/19 5:00 PM	47	
49		**Settings**	**6 days?**	**11/12/19 8:00 AM**	**11/19/19 5:00 PM**		
50		Designing setting page	4 days?	11/12/19 8:00 AM	11/15/19 5:00 PM		
51		**Implementing setting properties**	**4 days?**	**11/14/19 8:00 AM**	**11/19/19 5:00 PM**		
52		Change bio	3 days?	11/14/19 8:00 AM	11/18/19 5:00 PM	35	
53		Change avatar	3 days?	11/15/19 8:00 AM	11/19/19 5:00 PM	35	
54		**Other User Profile page**	**10 days?**	**11/12/19 8:00 AM**	**11/25/19 5:00 PM**		
55		Designing other user profile page	4 days?	11/12/19 8:00 AM	11/15/19 5:00 PM		
56		Implementing other user profile page	5 days?	11/18/19 8:00 AM	11/22/19 5:00 PM	55	
57		Send comment to other user profile	1 day?	11/25/19 8:00 AM	11/25/19 5:00 PM	56	
58		**Search**	**11 days?**	**11/19/19 8:00 AM**	**12/3/19 5:00 PM**		
59		Designing search page	3 days?	11/19/19 8:00 AM	11/21/19 5:00 PM		
60		Designing search result page	3 days?	11/20/19 8:00 AM	11/22/19 5:00 PM		
61		Implementing user search	2 days?	11/25/19 8:00 AM	11/26/19 5:00 PM	60	
62		Implementing exercise search	5 days?	11/27/19 8:00 AM	12/3/19 5:00 PM	60	
63		Milestone 2	1 day?	11/26/19 8:00 AM	11/26/19 5:00 PM	37	
64		**Annotation**	**14 days?**	**12/4/19 8:00 AM**	**12/23/19 5:00 PM**	**49**	
65		Text Annotation	6 days?	12/4/19 8:00 AM	12/11/19 5:00 PM		
66		Image Annotation	8 days?	12/12/19 8:00 AM	12/23/19 5:00 PM		
67		**Exercise**	**13 days?**	**12/5/19 8:00 AM**	**12/23/19 5:00 PM**		
68		Designing exercise page	7 days?	12/5/19 8:00 AM	12/13/19 5:00 PM		
69		Implementing exercies page	6 days?	12/16/19 8:00 AM	12/23/19 5:00 PM	68	
70		Final Milestone	1 day?	12/24/19 8:00 AM	12/24/19 5:00 PM	63	
71		**Android**	**61 days?**	**10/1/19 8:00 AM**	**12/24/19 5:00 PM**		**Yagmur Kahyaoglu;Bartu Oren;Ebru Zorlu;Berke Can Gürer**
72		Login	3 days	10/1/19 8:00 AM	10/3/19 5:00 PM		
73		Register	3 days	10/4/19 8:00 AM	10/8/19 5:00 PM		
74		Logout	3 days	10/9/19 8:00 AM	10/11/19 5:00 PM	72	
75		Language selection screen	2 days	10/14/19 8:00 AM	10/15/19 5:00 PM	72;73	
76		Question screen	2 days	10/16/19 8:00 AM	10/17/19 5:00 PM	75	
77		Profile page	2 days	10/18/19 8:00 AM	10/21/19 5:00 PM	72;76	
78		Milestone 1	1 day?	10/22/19 8:00 AM	10/22/19 5:00 PM		
79		Editing question screen (feedback)	3 days?	10/23/19 8:00 AM	10/25/19 5:00 PM	76	
80		Editing profile screen (feedback)	3 days?	10/23/19 8:00 AM	10/25/19 5:00 PM	77	
81		**Chat**	**11 days?**	**10/28/19 8:00 AM**	**11/11/19 5:00 PM**		
82		Get chat message with username	4 days?	10/28/19 8:00 AM	10/31/19 5:00 PM		
83		Designing chat screen	4 days?	10/29/19 8:00 AM	11/1/19 5:00 PM		
84		Implementing Send message fetaure	3 days?	11/4/19 8:00 AM	11/6/19 5:00 PM	83	
85		Designing and implementing Chat history screen	4 days?	11/4/19 8:00 AM	11/7/19 5:00 PM	83	
86		Implementing swipe to refresh feature	2 days?	11/8/19 8:00 AM	11/11/19 5:00 PM	85	
87		**Search**	**6 days?**	**11/12/19 8:00 AM**	**11/19/19 5:00 PM**		
88		Designing search screen	3 days?	11/12/19 8:00 AM	11/14/19 5:00 PM		
89		Implementing user search	3 days?	11/15/19 8:00 AM	11/19/19 5:00 PM	88	
90		Send comment to other user	4 days?	11/18/19 8:00 AM	11/21/19 5:00 PM	77	
91		**Setting**	**5 days?**	**11/20/19 8:00 AM**	**11/26/19 5:00 PM**	**77**	
92		Designing profile page to adding setting button	3 days?	11/20/19 8:00 AM	11/22/19 5:00 PM		
93		Implementing permission request activity from device	2 days?	11/25/19 8:00 AM	11/26/19 5:00 PM	92	
94		**Implementing setting properties**	**3 days?**	**11/21/19 8:00 AM**	**11/25/19 5:00 PM**		
95		Change bio	2 days?	11/21/19 8:00 AM	11/22/19 5:00 PM		
96		Change avatar	2 days?	11/22/19 8:00 AM	11/25/19 5:00 PM		
97		**Exercise**	**22 days?**	**11/22/19 8:00 AM**	**12/23/19 5:00 PM**		
98		Designing Exercise selection screen	2 days?	11/22/19 8:00 AM	11/25/19 5:00 PM		
99		Implementing exercise screen	19 days?	11/27/19 8:00 AM	12/23/19 5:00 PM	98	
100		Milestone 2	1 day?	11/26/19 8:00 AM	11/26/19 5:00 PM	75	
101		**Writing**	**18 days?**	**11/27/19 8:00 AM**	**12/23/19 5:00 PM**		
102		Designing writing screen	11 days?	11/27/19 8:00 AM	12/11/19 5:00 PM		
103		Implementing writing page	7 days?	12/13/19 8:00 AM	12/23/19 5:00 PM	102	
104		**Annotation**	**19 days?**	**11/27/19 8:00 AM**	**12/23/19 5:00 PM**		
105		Text Annotation	11 days	11/27/19 8:00 AM	12/11/19 5:00 PM		
106		Image Annotation	8 days?	12/12/19 8:00 AM	12/23/19 5:00 PM		
107		Final Milestone	1 day?	12/24/19 8:00 AM	12/24/19 5:00 PM	100	

ProjectPlan