SWE 573 2022 SPRING

FINAL REPORT

Serdar Apaydın

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Project Name: Learn Commune

Student Name: Serdar Apaydın

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deployment url: http://ec2-18-157-74-18.eu-central-1.compute.amazonaws.com/

HONOR CODE

Related to the submission of all the project deliverables for the Swe573 2022 Spring semester project reported in this report, I Serdar Apaydın declare that:

- I am a student in the Software Engineering MS program at Bogazici University and am registered for Swe573 course during the 2022 Spring semester.

- All the material that I am submitting related to my project (including but not limited to the project repository, the final project report, and supplementary documents) have been exclusively prepared by myself.

- I have prepared this material individually without the assistance of anyone else with the exception of permitted peer assistance which I have explicitly disclosed in this report.

Your Name

Serdar Apaydın

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Project Summary

Co-learning is the term for sharing learning process of a topic together. People who are interested in a topic share their experiences and ways of learning contents with each other in co-learning process. Purpose of project is to create a web application for people who are willing to learn topic that they interested in together with other people who are also interested in same topic.

Stakeholder demands a web application for people willing to experience co-learning process. In order to experience that learning style, learning spaces should be created. In learning space environment, there can be classical teaching method as lectures and documents in content section. Creator of learning space can authorize some users to edit this lectures and documents to increase co-learning experiences. Other than that content section of learning space, users can share their questions and thoughts on this topic via community posts sections. They can argue about this topic in community posts. Also, they can share their learning materials in learning space. They can create a chat room or arrange an online meeting. Users can also have a shared sketch board to discuss about a problem or a topic. All these features aims to increase co-learning experience among users.

Throughout the project, preliminary requirement analysis, elicitation, finalizing requirements, mockup designs and drawing UML diagrams phases has been completed. Also, a project plan has been defined to deliver project on time. In preliminary requirement phase, stakeholder shared her ideas about web application basically. For the interview to decide requirements, interview questions are prepared. After interviewing with stakeholder, requirement analysis has been done accordingly her requests. Mockup designs are drawn, and scenarios are created with the light of requirement analysis. In order to design software, use case, class and sequences diagrams have been created. Through requirements, scenarios, mockup designs and UML diagrams, next deliverables are designed and weekly planned in 8 weeks period.

Three more milestones and work packages that needs to be completed are defined. First milestone aims to deliver an example of functioning learning space. Second milestone aims to a complete web application of co-learning environment. Final milestone's purpose is to deliver a deployed complete web application.

Deliverables

Requirements

User account

- Users shall register to application.
- Registration shall require an user name, e-mail address and password.
- Users shall login to use application.
- Login shall require user name or e-mail address with correct password.
- User shall be able to sign out.
- User accounts shall have profile page.
- Profile page shall have info section.

- Profile page shall have avatar.
- Badges defined in a learning space shall be shown in profile page.
- User accounts shall have avatar selection option.

Learning Space

- Users shall be able create a learning space.
- Learning space shall have
- Users shall be able to join a learning space.
- Joining learning space shall be free of charge.
- Creaters shall control which other user can join their learning space.
- Creaters shall control posting authoritization of their learning space.
- Creaters shall be able to post videos on their learning space.
- Creaters shall be able to post slide presentations on their learning space.
- Users participating in a learning space shall have a communication channel between them.
- Users in a learning space shall be able to create quiz for other users in learning space.
- Quizes shall have multiple-choice selection, gap filling with multiple choice and yes or no questions.
- Correct answers shall be defined by the user who creates the quiz.
- Learning space shall be able to have badges.
- Badges shall be able to be created by owner of learning space.
- Badges shall be able to appointed to users in learning space.
- Learning space shall have calender section.
- Users in learning space shall be to arrange or suggest an online meeting in the calender section.
- Online meeting suggestions shall be responded by users in learning space.
- Responses of online meetings shall be one of these selections: accept, decline or tentative.
- Videos shall be shareable in leaning space.
- Pictures shall be shareable in learning space.
- Users shall be able to post in learning space.

Searching and categorizing learning space

- Learning space shall have categorization labels.
- There shall be a search bar for finding learning spaces.
- Search bar shall find and display related learning spaces with the word searched for.
- Search algorithm shall have semantic learning algorithm.
- Semantic learning algorithm shall be able to find and suggest related learning spaces that have semantic relation with the word searched for.

Scenarios

Create a learning space

Görkem is passionate about modern philosophy and has enough knowledge to tutor people who are interested in. Also, he likes to discuss philosophical topics with people. He decides to create a learning space to share his knowledge and widen his horizon with other people's ideas.

- Görkem enters the web application with his login credentials.
- Pushes the `create learning space` button placed top right of the home page.
- Creating a learning space page is popped up.
- Görkem fills the required fields on creating learning space page:
    - Title
    - Description
- When Görkem fills the fields above pushes the create button.
- Görkem has an empty learning space now and wants to add content in this learning space. In content section of learning space, Görkem pushes the "add content" button.
- When adding content page appears, application asks to fill the sections below.
    - Title of content
    - Short description
    - Learning material to upload
- When Görkem fills the required fields, pushes the add content button.

Search a learning space

Işıl wants to learn what modern philosophy is and to share her ideas with other people who are interested in modern philosophy.

- Işıl enters the web application with his login credentials.
- Işıl enters the keyword ("modern philosophy") on search bar at the top of the home page.

- When Işıl push the search button, web application listed down the learning spaces about modern philosophy.
- List down order is default by ranking of the learning space.

Mockup Designs

Registration Page

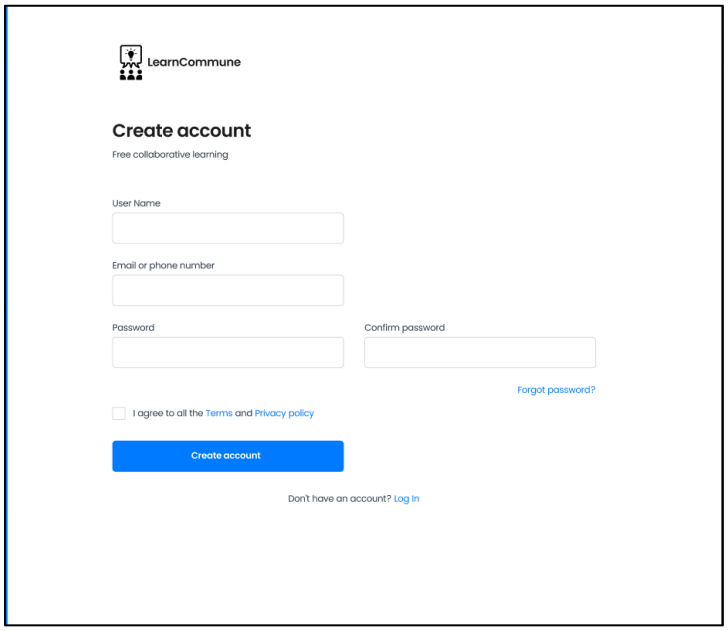

Figure 1- Register Page

Sign In Page

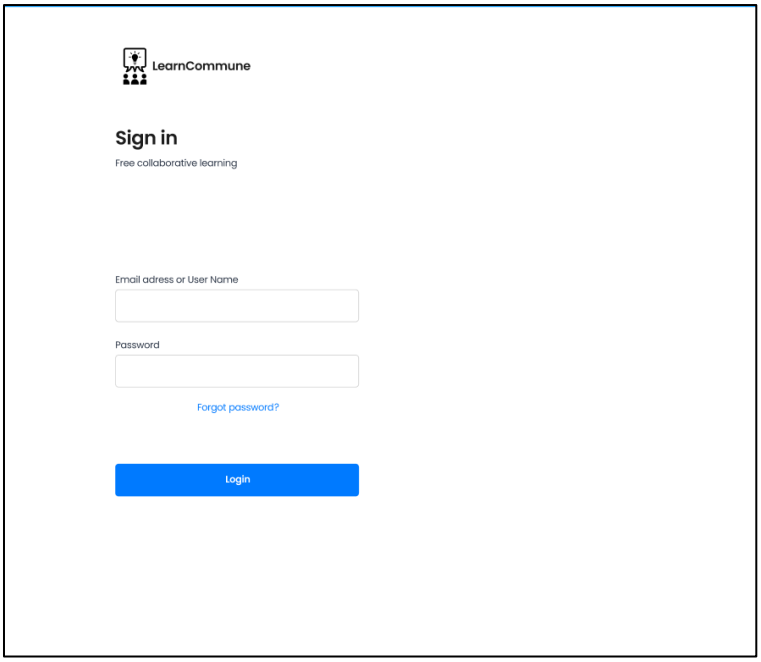

Figure 2- Sign In Page

Home

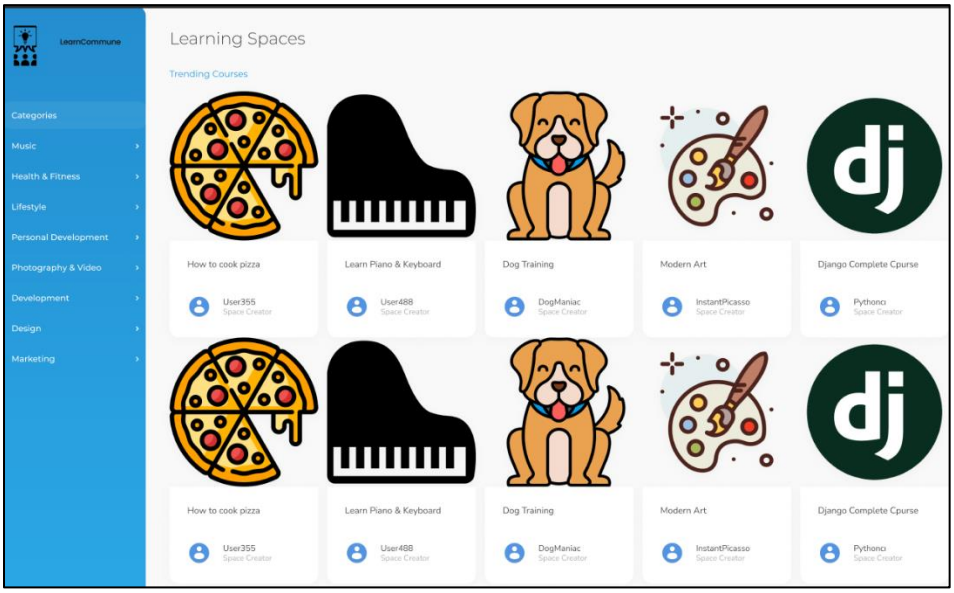

Figure 3-Home Page

Learning Space Example

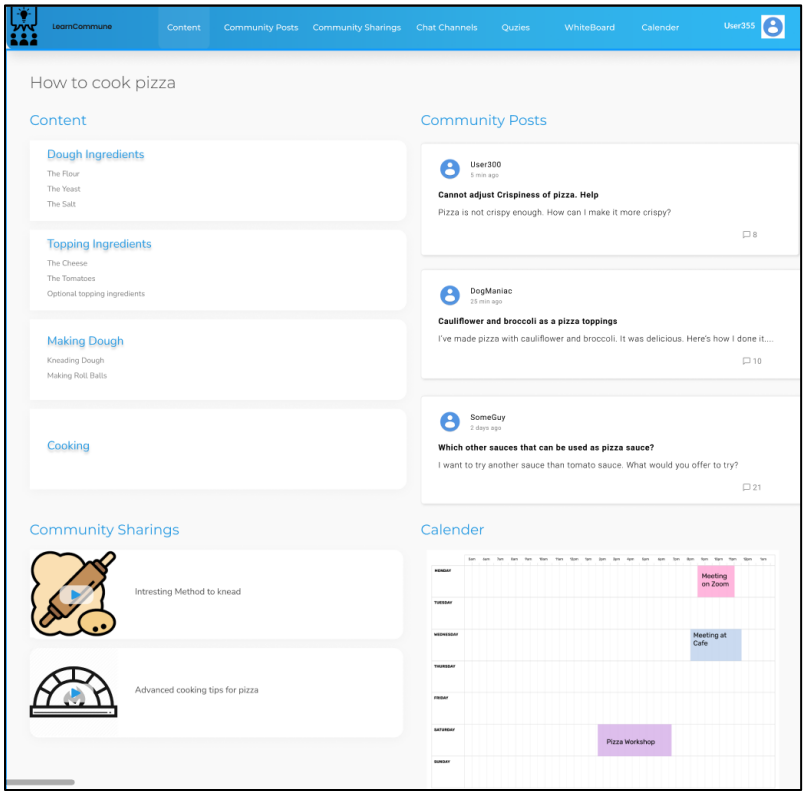

Figure 4 - Learning Space Page

UML Diagrams

Use Cases

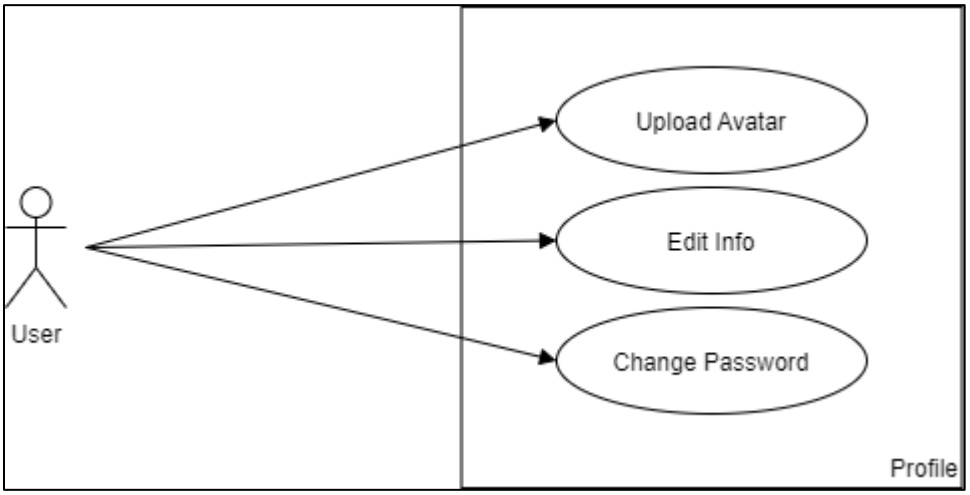

Figure 5 - Use Case for Profile Page

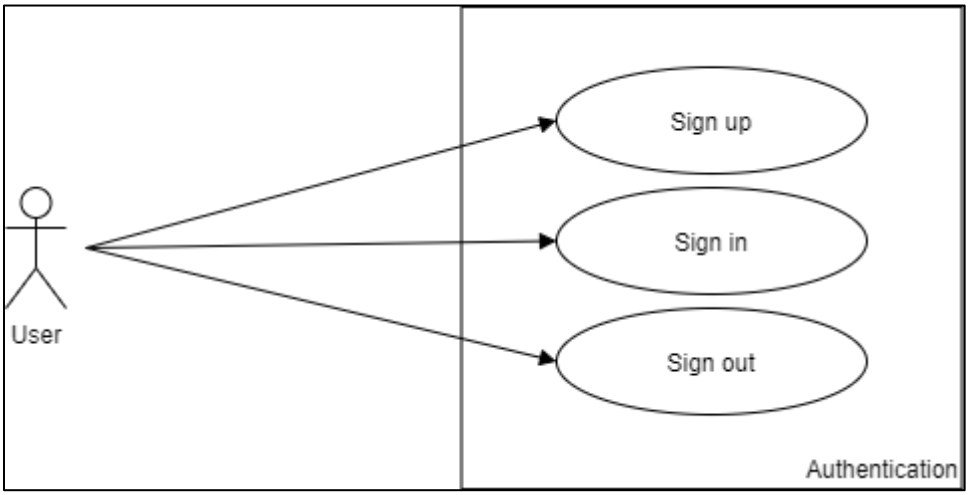

Figure 6- Authentication

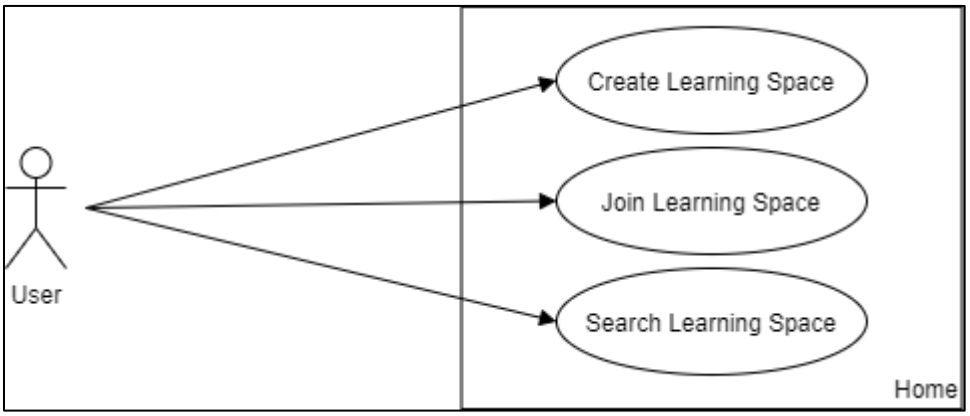

Figure 7-Use Case For Home Page

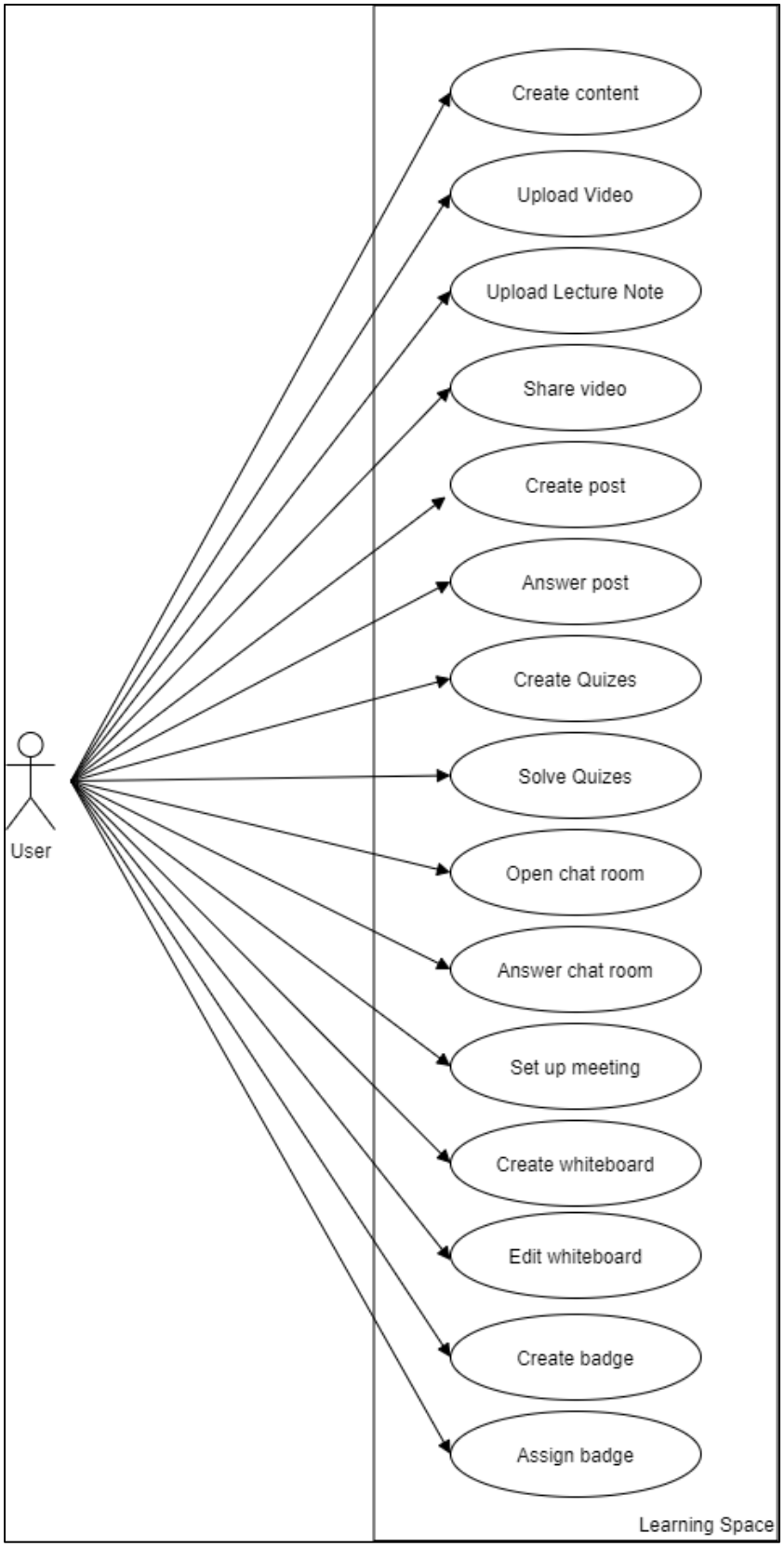

Figure 8-Use Case For Learning Space

Class Diagram

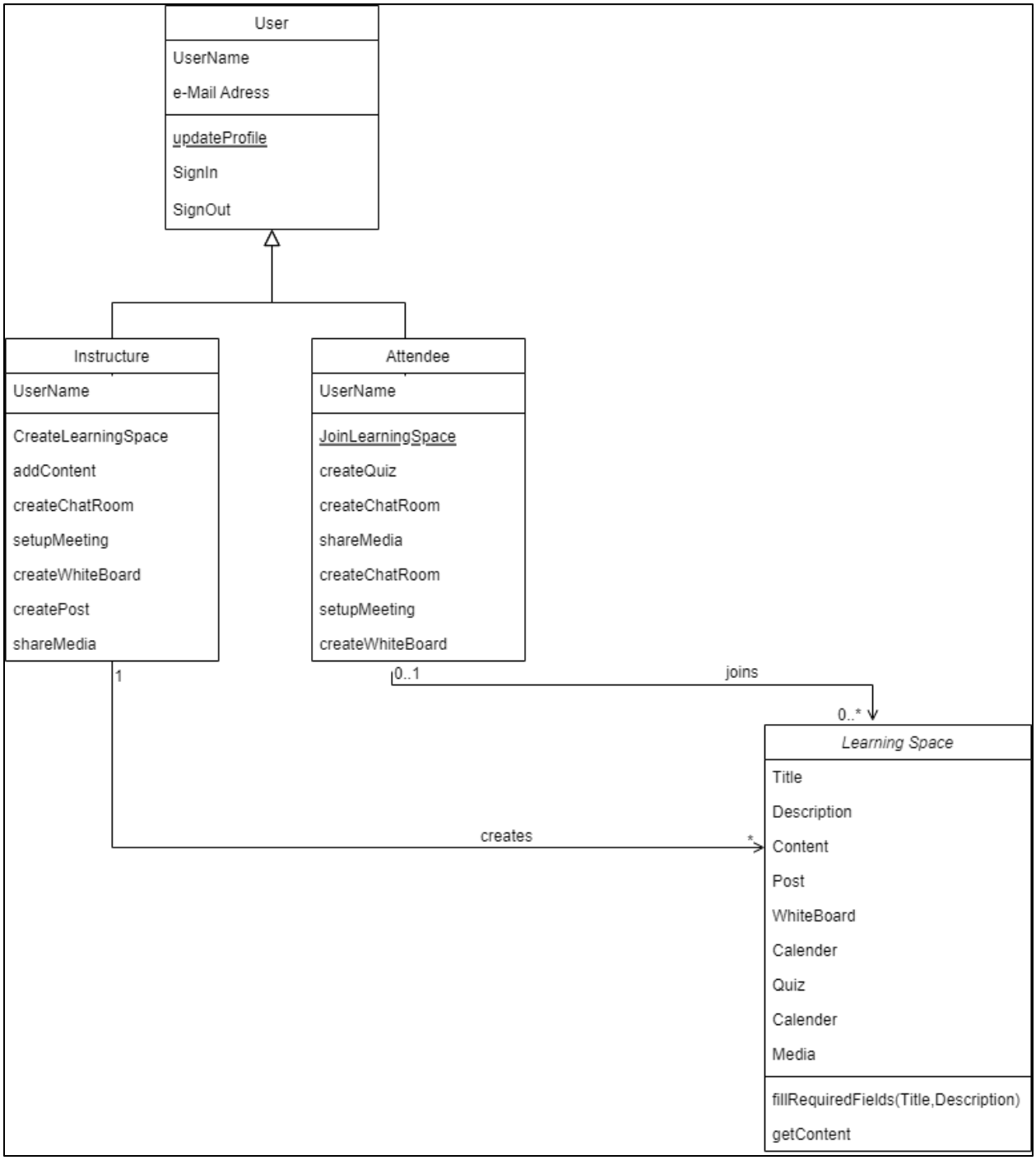

Figure 9- Class Diagram

Sequence Diagrams

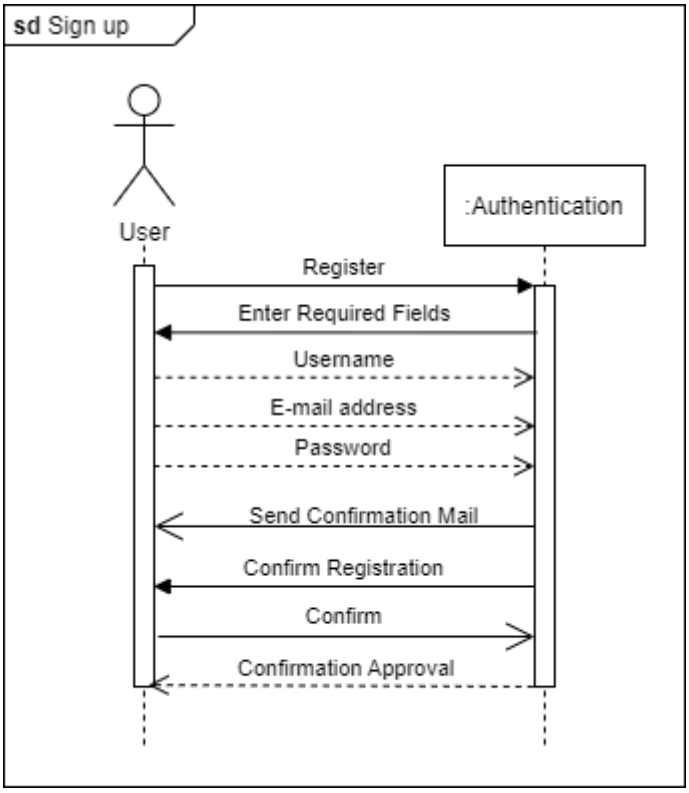

Figure 10 - Sequence Diagram for Authentication

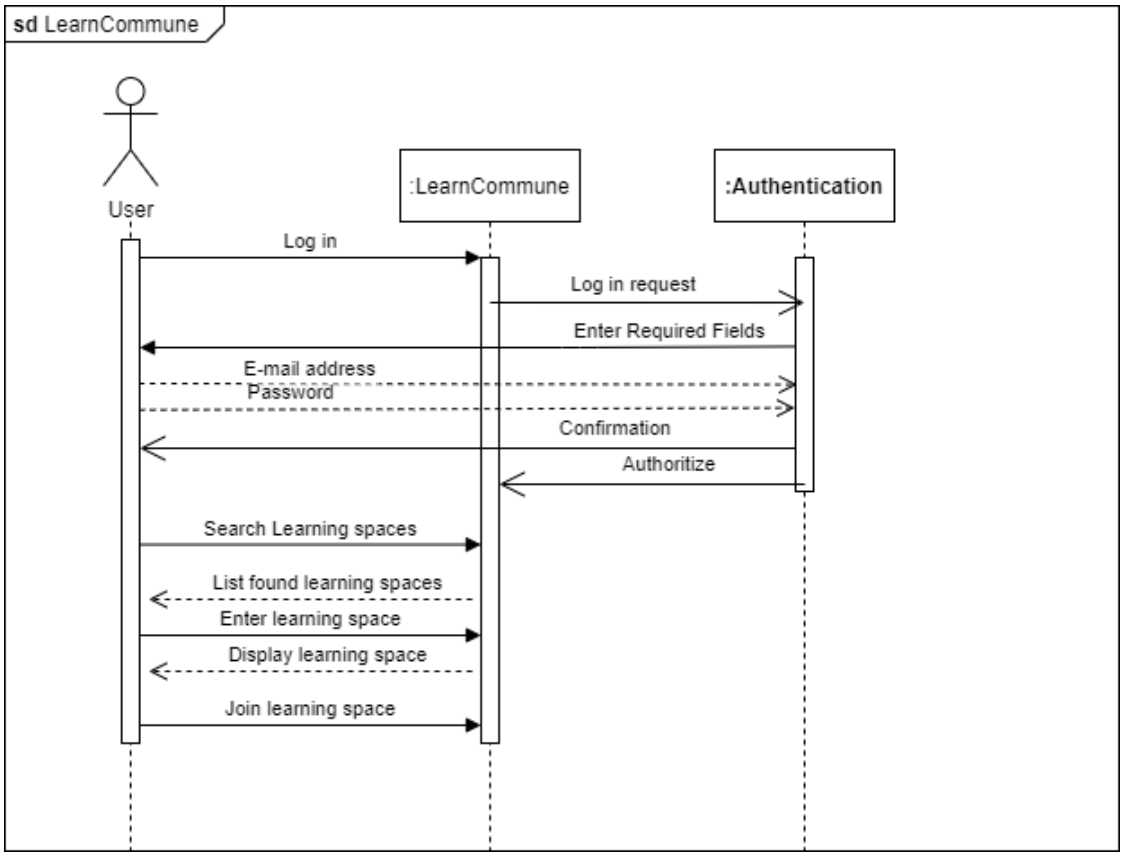

Figure 11- Sequence Diagram for Login and Join to Learning Space

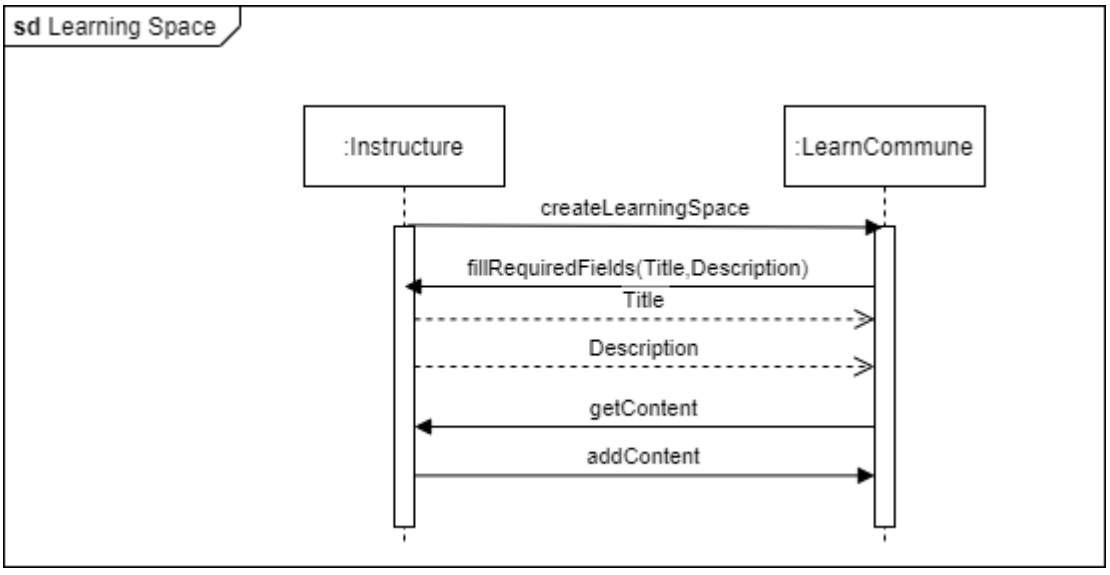

Figure 12-Sequence Diagram for Creating Content

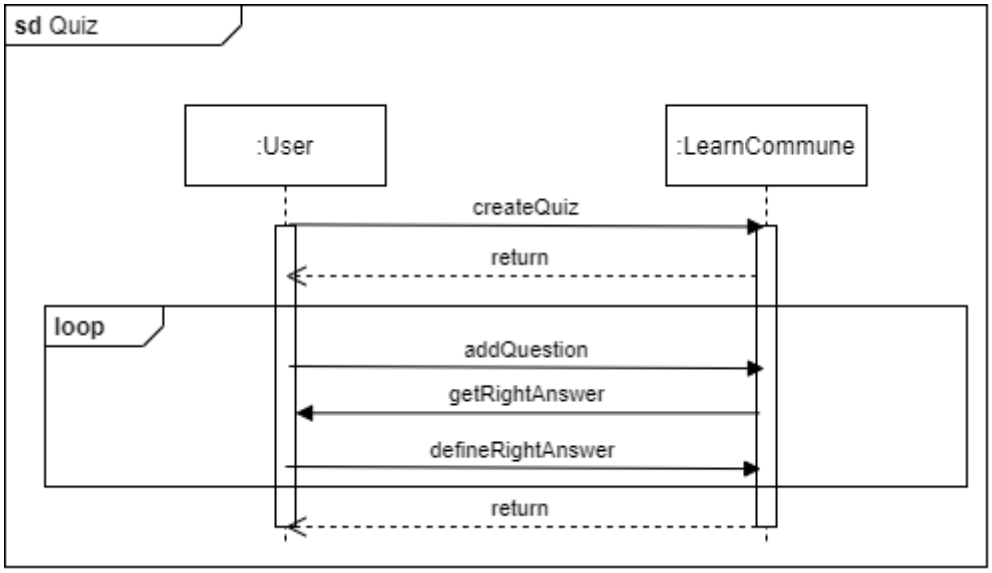

Figure 13-Sequence Diagram for Quiz

Project Plan

Week 7 deliverables

- Docker containerization research and implementation
- Sign up, sign in and sign out processes' implementation to application
- Home page layout implementation
- Learning space general layout implementation with sections below
    - Content
    - Community posts
    - Quizzes
    - Chat Rooms
    - Calendar
    - WhiteBoard (Sketching board)

Week 8 deliverables

- Content section implementation of learning space with features below.
    - Adding lecture to content
    - Upload feature of lecture slide or video to lecture
- Community posts section implementation with features below.
    - Creating a post
    - Answering a post

Week 9 deliverables (Milestone 2)

- Quiz section of learning space with features below
    - Creating quiz
    - Defining right answers
    - Checking quiz answers

    - Display quiz result
    - Answer quiz questions
- Chat Section implementation of learning space

Week 10 deliverables

- Implementation of Whiteboard in learning space (Sketching board)
- Creating a learning space function implementation
- Implementation of Home Page
- Implementation of search bar to Home Page

Week 11 deliverables (Milestone 3)

- User Profile edit function implementation
- Categorizing learning space function implementation

Week 12 deliverables

- User Testing

Week 13 deliverables

- Deployment

Week 14 deliverables (Milestone 4)

- If necessary, minor fixes regarding to functionality of features

PROJECT MILESTONES

Milestone 2: End of Week 9:

- **Objective:** A functioning learning space example.

Milestone 3: End of Week 11:

- **Objective:** Fully functional web application for co-learning.

Milestone 4: End of Week 14:

- **Objective:** Delivery of deployed and fully functional co-learning web application.

STATUS OF PROJECT

REQUIREMENT STATUS

Half of the requirements are implemented to the application. Requirement status is shown in tables below according to requirement categories.

User account requirement status

Req. No	Requirement	Status
1	Users shall register to application.	Completed
2	Registration shall require an user name, e-mail address and password.	Completed
3	Users shall login to use application.	Completed
4	Login shall require user name or e-mail address with correct password.	Completed
5	User shall be able to sign out.	Completed
6	User accounts shall have profile page.	Not completed
7	Profile page shall have info section.	Not completed
8	Profile page shall have avatar.	Not completed
9	Badges defined in a learning space shall be shown in profile page.	Not completed
10	User accounts shall have avatar selection option.	Completed

Learning Space requirement status

Req. No	Requirement	Status
1	Users shall be able create a learning space.	Completed
2	Users shall be able to join a learning space.	Completed
3	Joining learning space shall be free of charge.	Completed
4	Creaters shall control which other user can join their learning space.	Not completed
5	Creaters shall control posting authoritization of their learning space.	Not completed
6	Creaters shall be able to post videos on their learning space.	Completed
7	Creaters shall be able to post slide presentations on their learning space.	Completed
8	Users participating in a learning space shall have a communication channel between them.	Not completed
9	Users in a learning space shall be able to create quiz for other users in learning space.	Completed
10	Quizes shall have multiple-choice selection, gap filling with multiple choice and yes or no questions.	Completed
11	Correct answers shall be defined by the user who creates the quiz.	Completed
12	Learning space shall be able to have badges.	Not completed

13	Badges shall be able to be created by owner of learning space.	Not completed
14	Badges shall be able to appointed to users in learning space.	Not completed
15	Learning space shall have calender section.	Not completed
16	Users in learning space shall be to arrange or suggest an online meeting in the calender section.	Not completed
17	Online meeting suggestions shall be responded by users in learning space.	Not completed
18	Responses of online meetings shall be one of these selections: accept, decline or tentative.	Not completed
19	Videos shall be shareable in leaning space.	Completed
20	Pictures shall be shareable in learning space.	Completed
21	Users shall be able to post in learning space.	Completed

Searching and categorizing learning space requirement status

Req. No	Requirement	Status
1	Learning space shall have categorization labels.	Not completed
2	There shall be a search bar for finding learning spaces.	Not completed
3	Search bar shall find and display related learning spaces with the word searched for.	Not completed
4	Search algorithm shall have semantic learning algorithm.	Not completed
5	Semantic learning algorithm shall be able to find and suggest related learning spaces that have semantic relation with the word searched for.	Not completed

DOCKER STATUS

Docker is used for project. There are two container; one is for Django application, one is for PostgreSQL database.

Figure 14: Local Docker Status

Local docker file code screenshot is shown below.

```yaml
version: "3.8"
services:
  app:
   build: .
   volumes:
    - .:/django
   ports:
    - 8000:8000
   image: app:django_deploy
   container_name: django_container
   command: python manage.py runserver 0.0.0.0:8000
   depends_on:
     - db
  db:
   image: postgres
   environment:
     - POSTGRES_DB=postgres
     - POSTGRES_USER=postgres
     - POSTGRES_PASSWORD=postgres
   container_name: postgres_db
```

Figure 15: Local docker-compose file settings.

DEPLOYMENT STATUS

AWS EC2 instance is used for deployment of application. Beside that public AWS repository is created and built docker image is pushed to AWS repository. Inside instance service, docker-compose file has been updated accordingly. Text file of docker-compose is shown below.

Deployment url: http://ec2-18-157-74-18.eu-central-1.compute.amazonaws.com/

```yaml
version: "3.8"
services:
  app:
   build: .
   ports:
      - "80:8000"
   image: public.ecr.aws/p2k7j5v2/django_deploy
   command: python manage.py runserver 0.0.0.0:8000
   environment:
      - POSTGRES_DB=postgres
      - POSTGRES_USER=postgres
      - POSTGRES_PASSWORD=postgres
   depends_on:
      - db
  db:
    image: postgres
    environment:
      - POSTGRES_DB=postgres
      - POSTGRES_USER=postgres
      - POSTGRES_PASSWORD=postgres
```

Figure 16- Docker compose file for AWS instance

USER MANUAL

TESTING APPLICATION

1. Test User1:
    a. Username: tester
    b. Password: password
2. TestUser2:
    a. Username: tester2
    b. Password: password

PAGE DESCRIPTIONS

- Users can reach application via http://ec2-18-157-74-18.eu-central-1.compute.amazonaws.com.
- On the top of the page, there is a navigation bar which contains some short links in the web application. Through that navigation bar, users can go to the sign-up page with clicking “sign up” button. Sign up page is shown below.

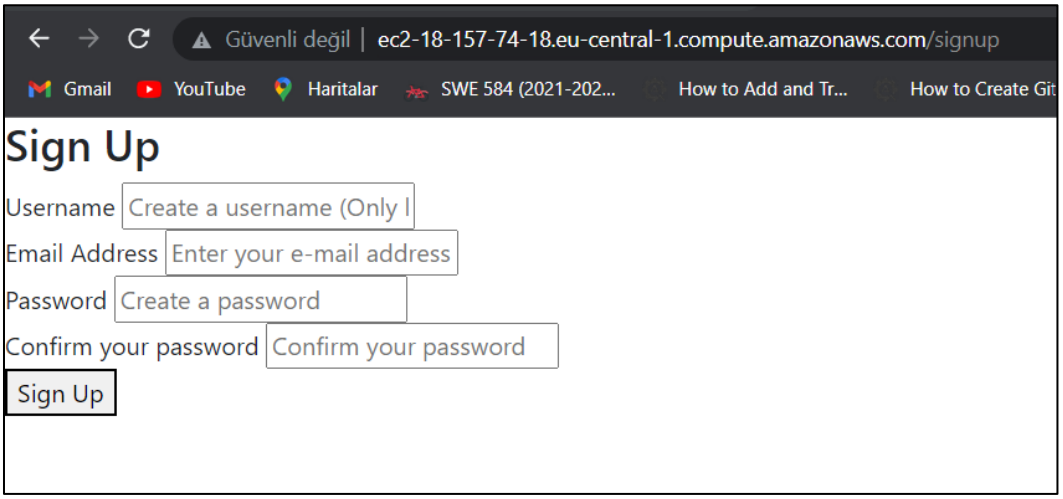

Figure 17- Sign up page

- In sign-up page, application requires username, email address and password to register. After submitted to sign up button, system sends an activation mail to user to confirm its registration.
- After activation step is completed, user can log in to the system with its username and password.
- In home page, user can create a learning space or look over the other learning spaces.

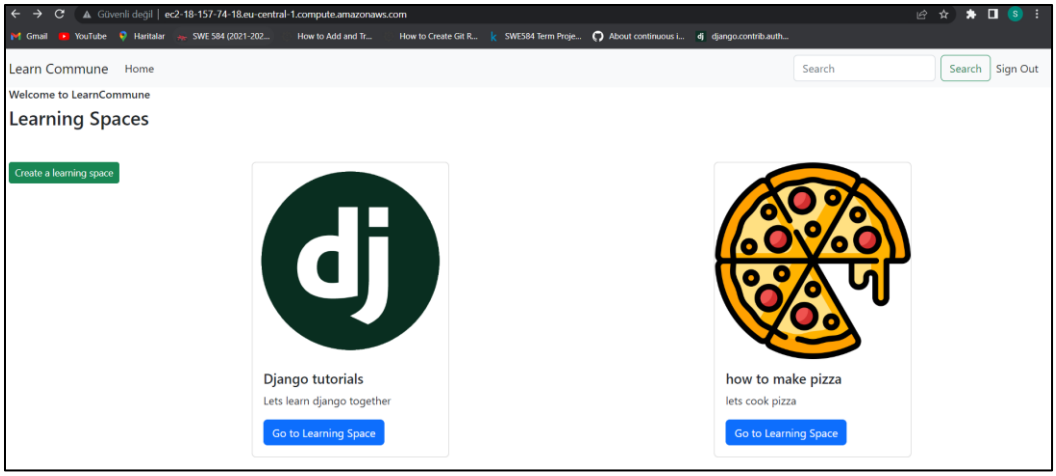

Figure 18- Home page of application

- In upper left corner, there is green button to create a new learning space. When user submit that button, s/he should provide a title, description and learning space thumbnail.
- In the content page of learning space, creator can upload a file as a learning material and uploaded learning materials is listed in content page.

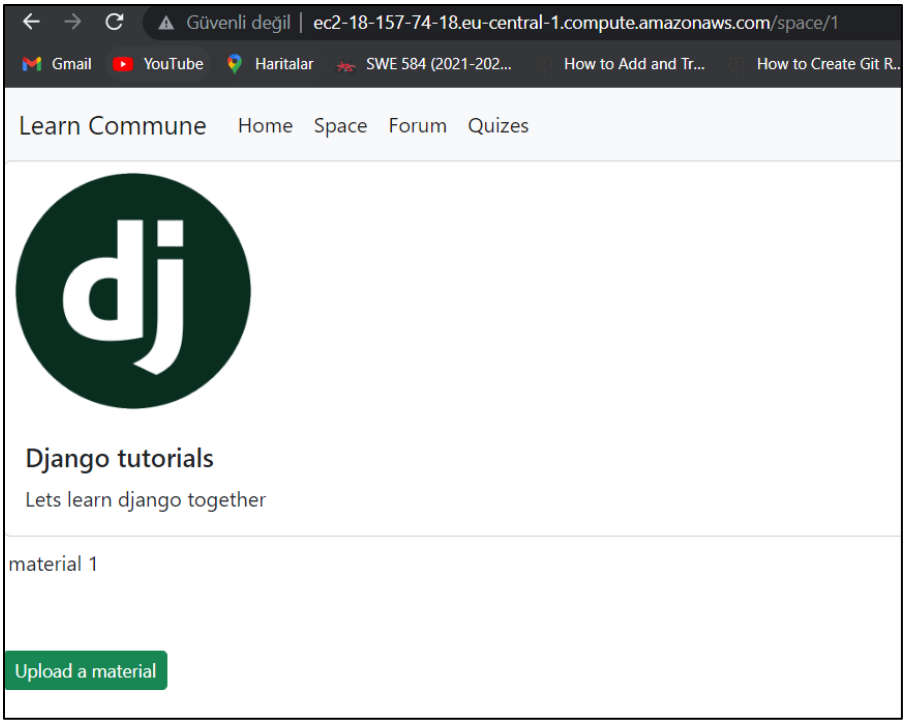

Figure 19- Learning space content page.

- In forum section, users can create a post via submitting the create a post button or can look over other listed posts in forum section via clicking on them.

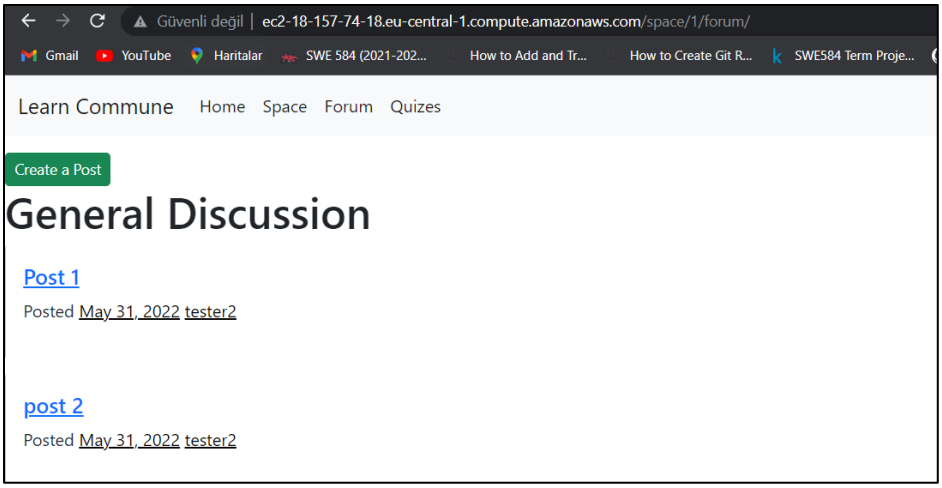

Figure 20- Forum section of learning space

- In quiz section, users can create quizzes for each other or they can answer an existing quizzes in the learning space.

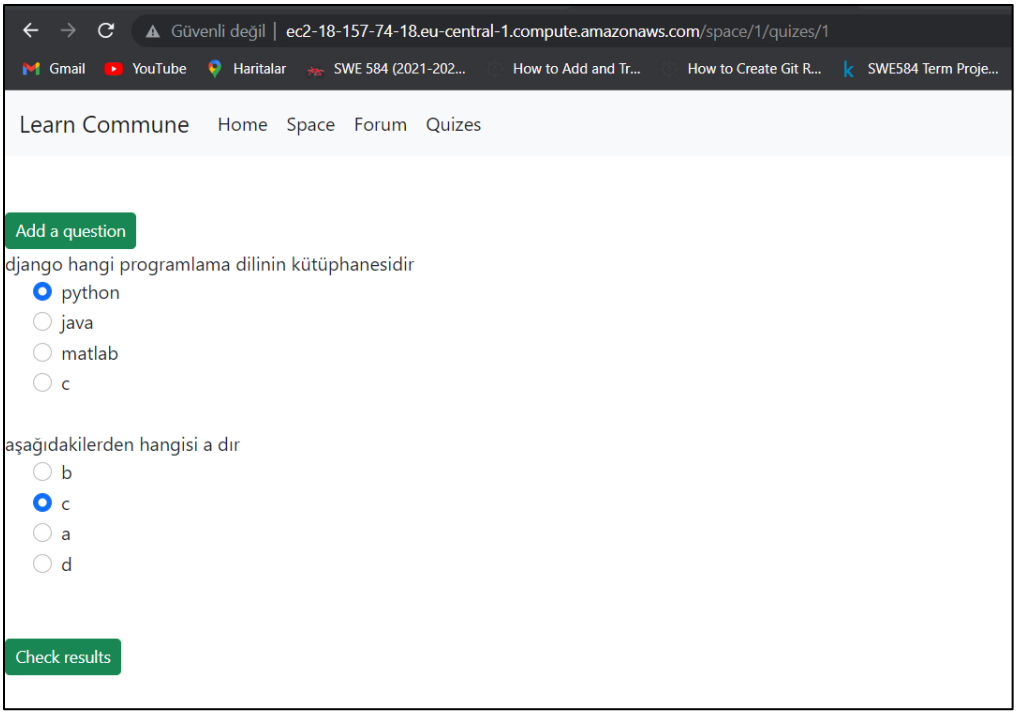

Figure 21- Answering quiz page in learning space

SYSTEM MANUAL

Application can be run if below prerequisites are met.

- Python
- Django
- PostgreSQL
- Docker
- Git

Steps to run project:

- In order to get code from repository
  - git clone https://github.com/SerdarApaydin/BounSWE573-2022Spring.git
- In order to build docker image:
  - docker build . -t app:django_deploy
- To be able to run application in docker container, docker-compose file settings should be configured with PostgreSQL database.
  - If the application will be run on local, figure 15 can be taken as reference docker-compose file settings.
  - If the application will be run on online instance, figure 16 can be taken as reference docker-compose file settings.
- After docker-compose settings are configured, docker containers should be running with command below.
  - Docker compose up
- When the docker containers running, if errors occur due to database models, with the command line below, dockerized application can be fixed in internal bash command window.
  - Docker exec -it <container name> bash
- And migrations can be done with the command lines below.
  - Python manage.py makemigrations
  - Python manage.py migrate,