Project Report

Name: Aydos İlgazi

Course: Swe 573

Date: 31.05.2022

Project Name: CoLearn App

Git Repository: https://github.com/AydosIlgazi/bounswe573-2022

Git Tag Version: v0.9

Deployment Uri: http://ec2-3-91-248-125.compute-1.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 Aydos Ilgazi 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.

Aydos Ilgazi

Testing Deployed System

User Id = usdukarli1

Password = swe573pass

User Id = uskudarli2

Password = swe573pass

Application has three authorization levels. These are:

-External User that is not logged in (Default)

-Logged in User (Login screen)

-Learning space participant (Learning space home page, join button)

When we follow top-down levels, next level includes functionalities of previous level as well as new functionalities that are not existed in previous ones.

For instance, a learning space participant can post resources and comment on existing resources. However, other user types have no such capabilities. To see full capabilities of the application, user must participate at least one learning space.

Licenses

Used third party packages and contents with their licenses:

Package/Content	**License**
tinymce	MIT License
django-widget-tweaks	MIT License
django_coverage_plugin	Apache License 2.0
matplotlib	PSF
networkx	BSD-new license
jquery	MIT License
bootstrap	MIT License
fontawesome	MIT License
elearning.png, home.png, participants.png, road-map.png	Flaticon License

The licenses that are mentioned in the above provides free commercial use. Their license files and license section in the headers are left intact. However, the .png files which are mentioned in the last row have no license section. Therefore, their license description has added to the footer in learning space home page as it is advised in the providers web-site.

LICENSE DECLARATION

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

- I abide by the licenses for all of the third-party packages and contents that I used in this project

Aydos İlgazi

Table of Contents

1. Overview

Project Name: CoLearn App

Business Case: This project does not have a regular business case. The aim is not adding value to a company since this is an education related project. The main value is learning and performing best practices during the software management and development process.

Problem: Today, there are lots of educatory web-sites available in the internet. However, these web-sites generally teaches using traditional way where a lecturer presents a lesson with video format. The problem is that there is no teaching platform which lets user actively participate in learning process with other learners

Goal: The goal is providing such learning environment that users can join learning spaces, share resources, notes and comments. Therefore, users will learn together with their co-learners.

Deliverables:

- A web app which will fulfill the goal of project.
- Project Repository
- Project Report
- Demo

Risks:

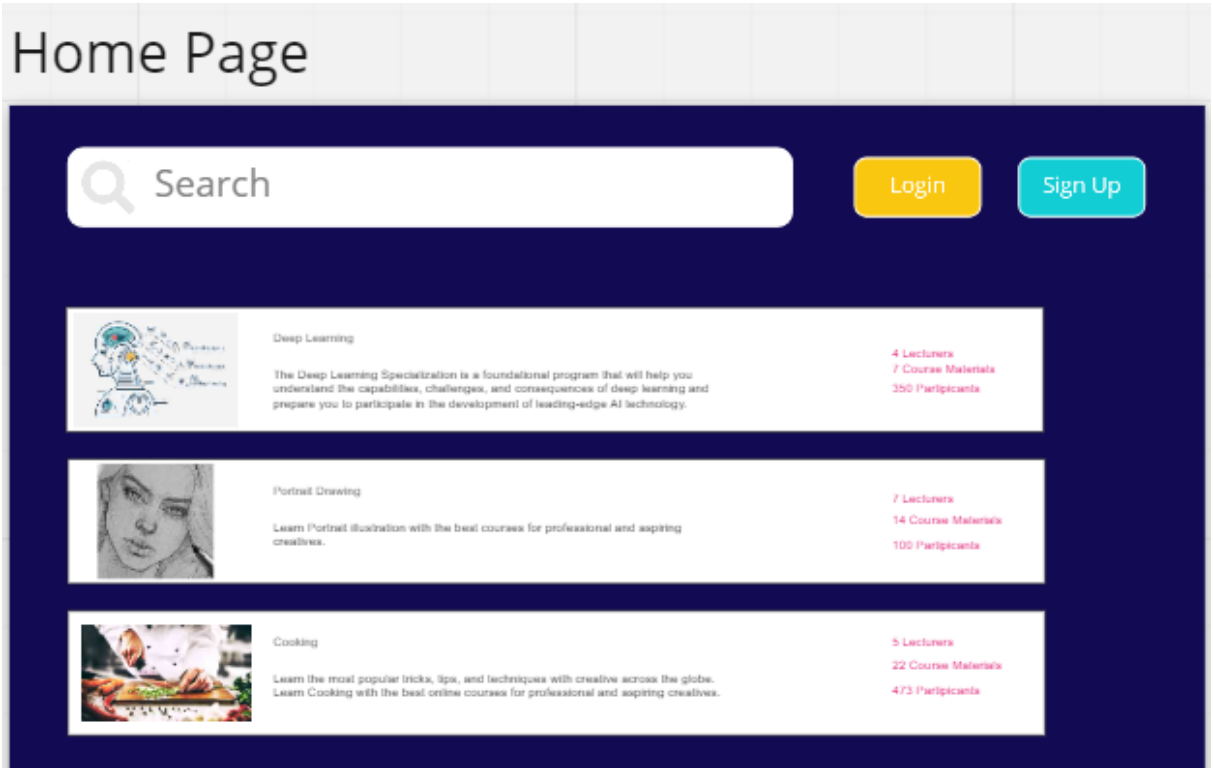
- No experience with Django
- Unpredictable workload that comes from other classes

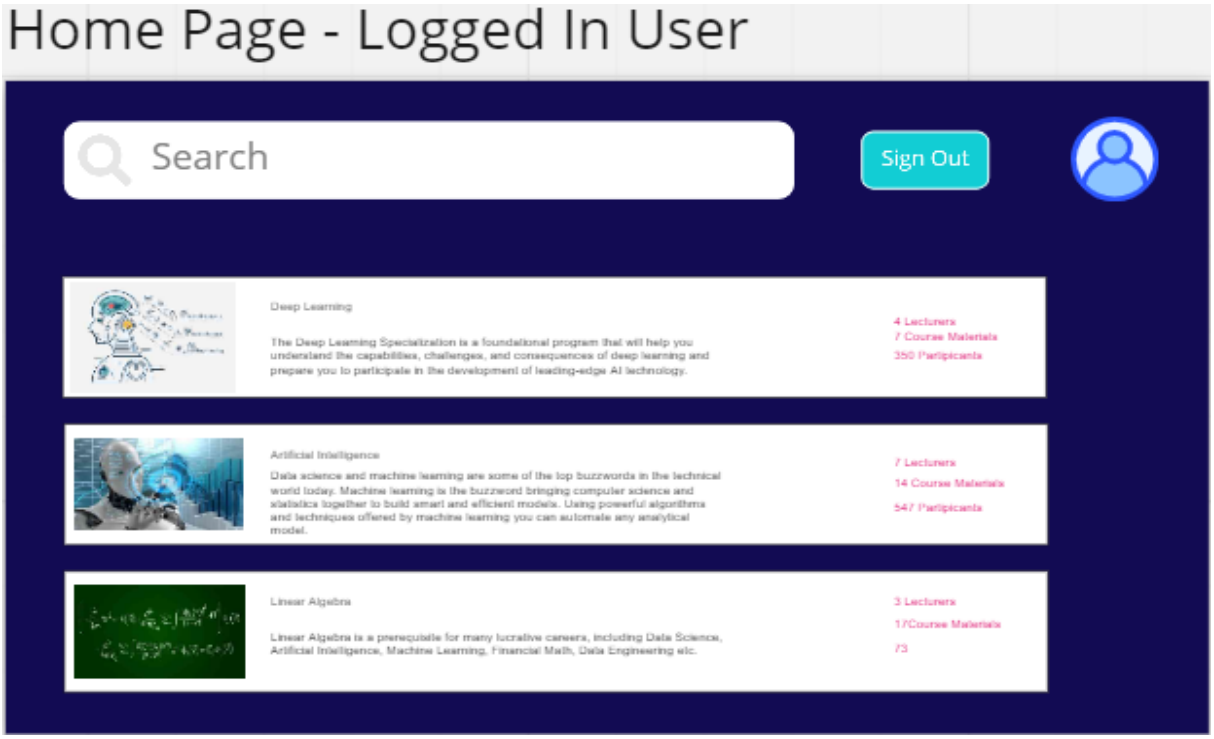
2. Requirements Specification

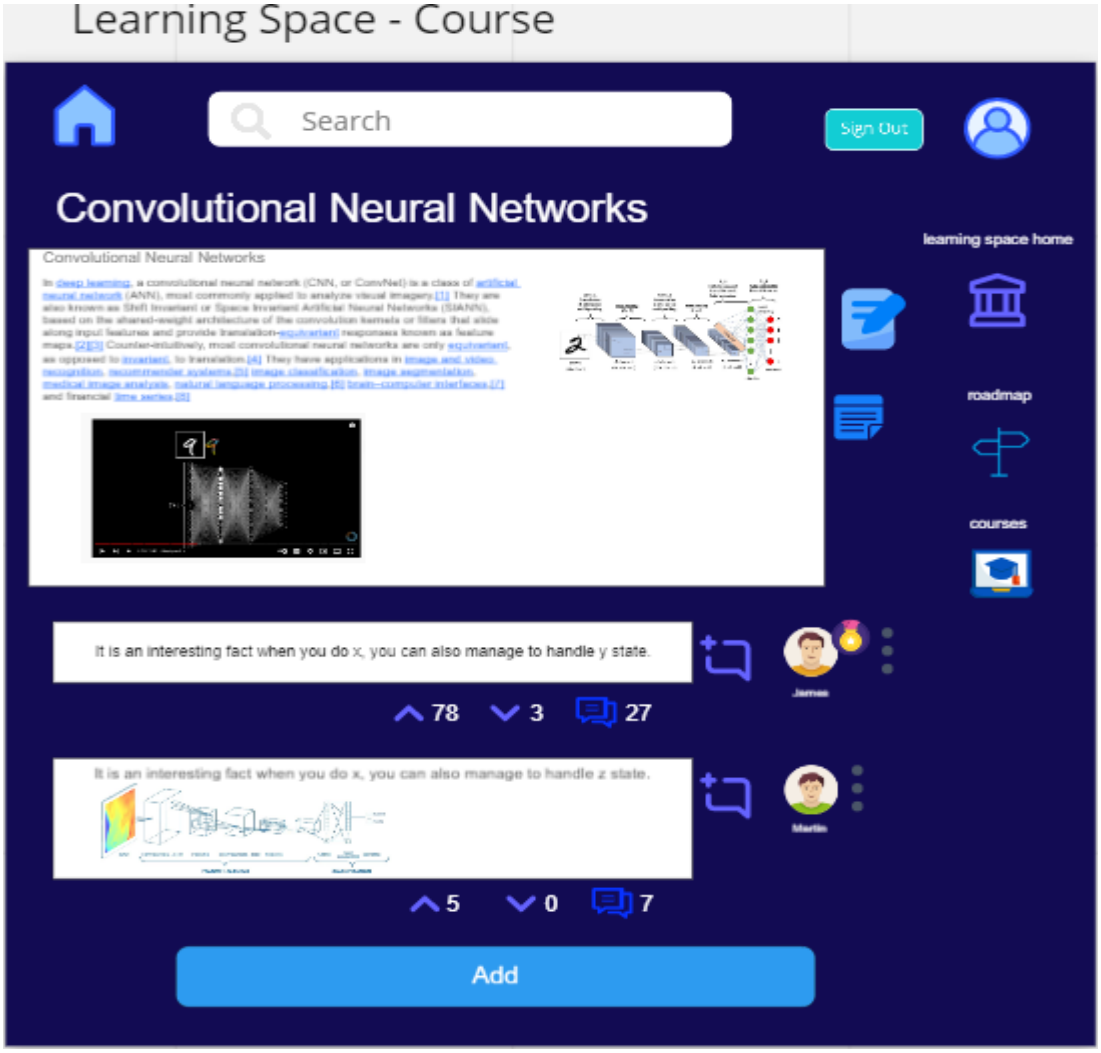
- Req1. User shall be able to create learning space.
- Req2. System shall display participant, course and content creator number of the learning space.
- Req3. User shall be able to add topics to learning space.
- Req4. User shall be able to edit topic contents.
- Req5. User shall be able to modify other users' roles in learning space.
- Req6. User shall be able to see roadmap in the learning space.
- Req7. Users shall be able to add prerequisites and estimated time to the topics.
- Req8. System shall update the roadmap when a new topic that has relation is added.
- Req9. System shall show the estimated time, prerequisites of the topics.
- Req10. User shall be able to add notes which are not visible to other users in the topic page.
- Req11. User shall be able to add resources to the topic page.
- Req12. Users shall be able to add resources to other users' resources.
- Req13. Users shall be able to up vote or down vote other users’ resources.
- Req14. System shall display up votes, down votes and resource numbers for each resource and to all users.

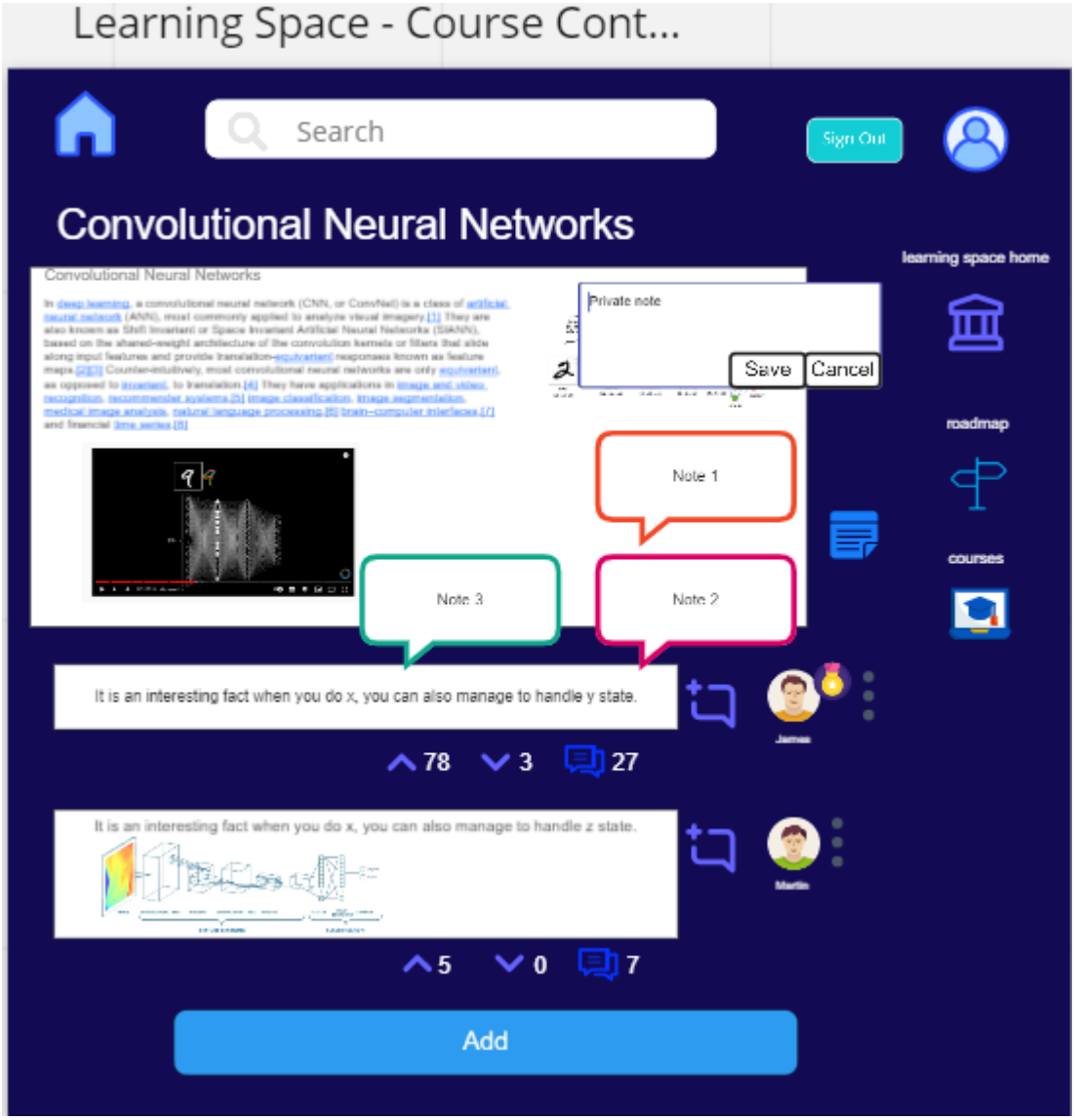
- Req15. Users shall be able to give badges to the other users.
- Req16. Users shall be able to add special badges to their learning spaces.
- Req17. System shall create badges.
- Req18. System shall give badges to the users according to their activity (up vote, down votes, resources, followers)
- Req19. Users shall be able to follow other users.
- Req20. Users shall be able to enter interested subjects to the system.
- Req21. Users shall be able to mute other users.
- Req22. Users shall be able to kick other users from the learning space.
- Req23. Users shall be able to add questionnaire to a topic.
- Req24. Users shall be able to up vote or down vote other users' questionnaire.
- Req25. System shall have semantic search.
- Req26. System shall be a web application.
- Req27. System shall implement e-mail authentication.
- Req28. System shall use relational database.
- Req29. System shall be implemented using Django.
- Req30. System shall run in container.

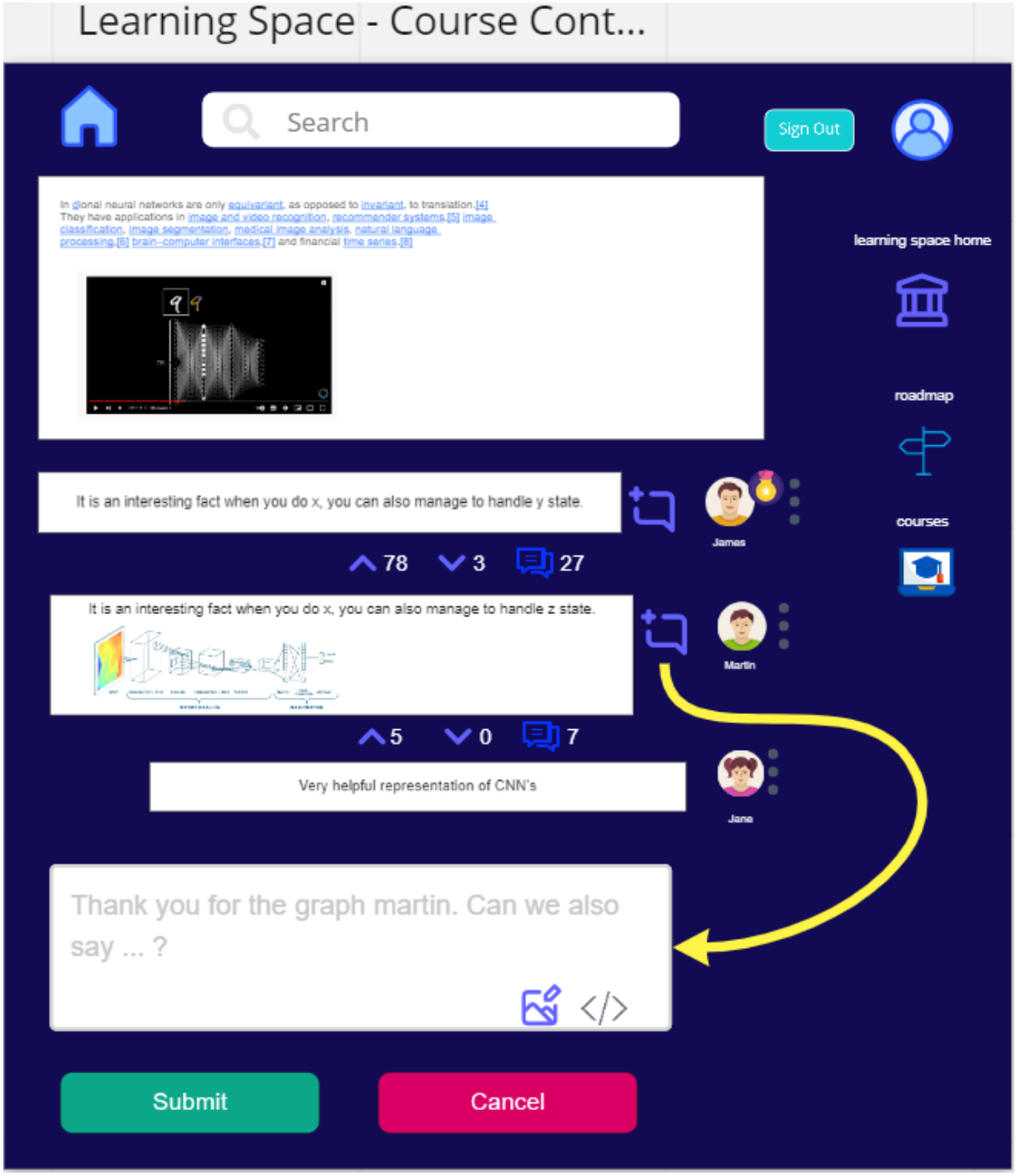
3. Mockups



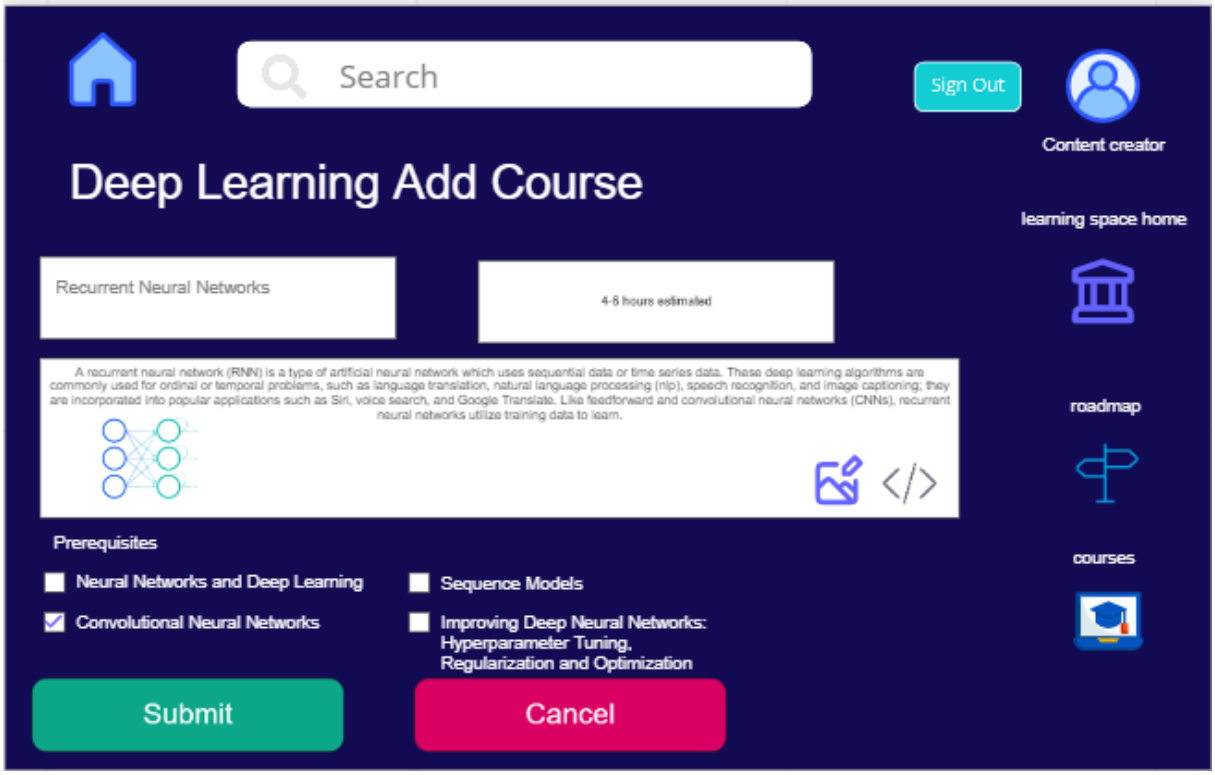

Home Page - Logged In User
Search
Sign Out
Deep Learning
The Deep Learning Specialization is a foundational program that will help you understand the capabilities, challenges, and consequences of deep learning and prepare you to participate in the development of leading-edge AI technology.
4 Lecturers
7 Course Materials
350 Participants
Artificial Intelligence
Data science and machine learning are some of the top buzzwords in the technical world today. Machine learning is the buzzword bringing computer science and statistics together to build smart and efficient models. Using powerful algorithms and techniques offered by machine learning you can automate any analytical model.
7 Lecturers
14 Course Materials
547 Participants
Linear Algebra
Linear Algebra is a prerequisite for many lucrative careers, including Data Science, Artificial Intelligence, Machine Learning, Financial Math, Data Engineering etc.
3 Lecturers
17Course Materials
73


Learning Space - Course
Search
Sign Out
Convolutional Neural Networks
learning space home
roadmap
courses
Convolutional Neural Networks
It is an interesting fact when you do x, you can also manage to handle y state.
78
3
27
James
It is an interesting fact when you do x, you can also manage to handle z state.
5
0
7
Martin
Add

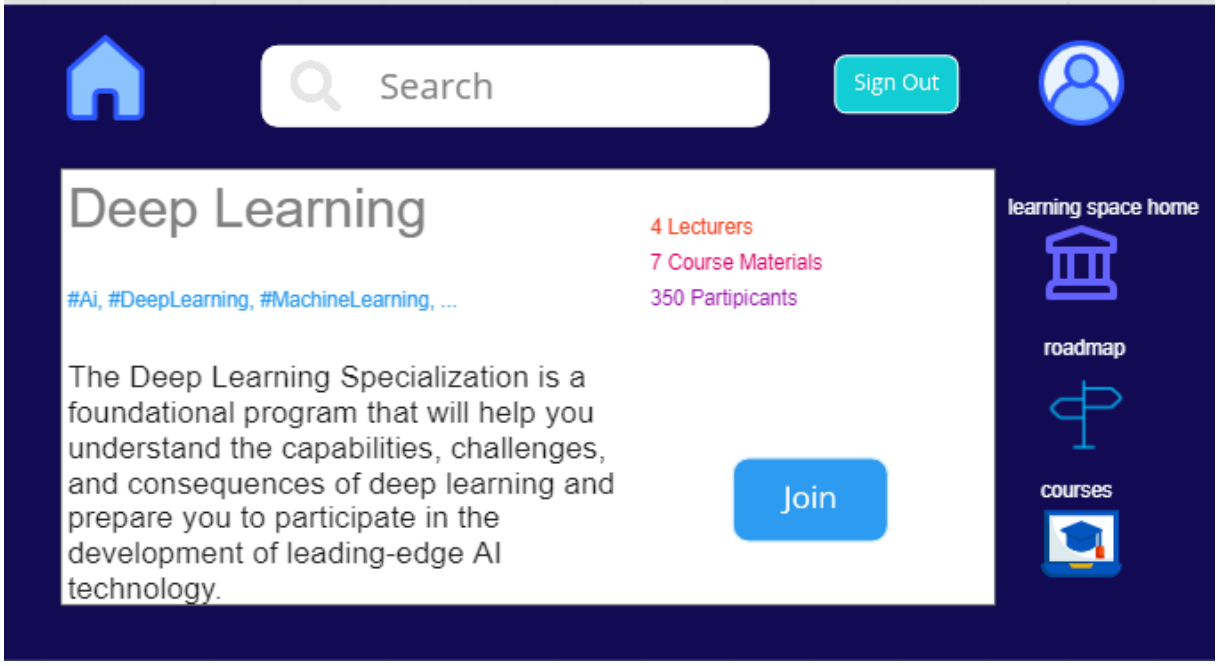

Learning Space - Course Cont...
Search
Sign Out
Convolutional Neural Networks
learning space home
roadmap
courses
Convolutional Neural Networks
Private note
Save
Cancel
Note 1
Note 3
Note 2
It is an interesting fact when you do x, you can also manage to handle y state.
78
3
27
It is an interesting fact when you do x, you can also manage to handle z state.
5
0
7
Add


Learning Space - Course Cont...
Search
Sign Out
learning space home
roadmap
courses
It is an interesting fact when you do x, you can also manage to handle y state.
James
78
3
27
It is an interesting fact when you do x, you can also manage to handle z state.
Martin
5
0
7
Very helpful representation of CNN's
Jane
Thank you for the graph martin. Can we also say ... ?
Submit
Cancel

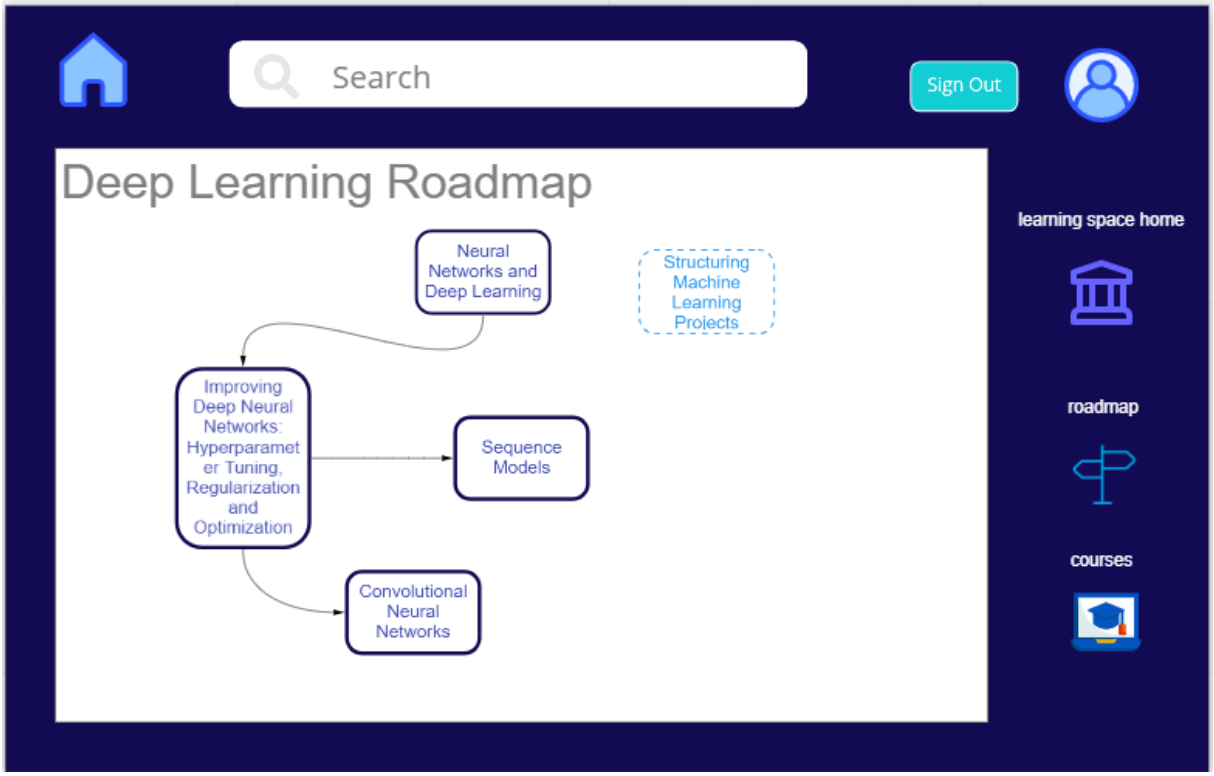
Learning Space - Create Course



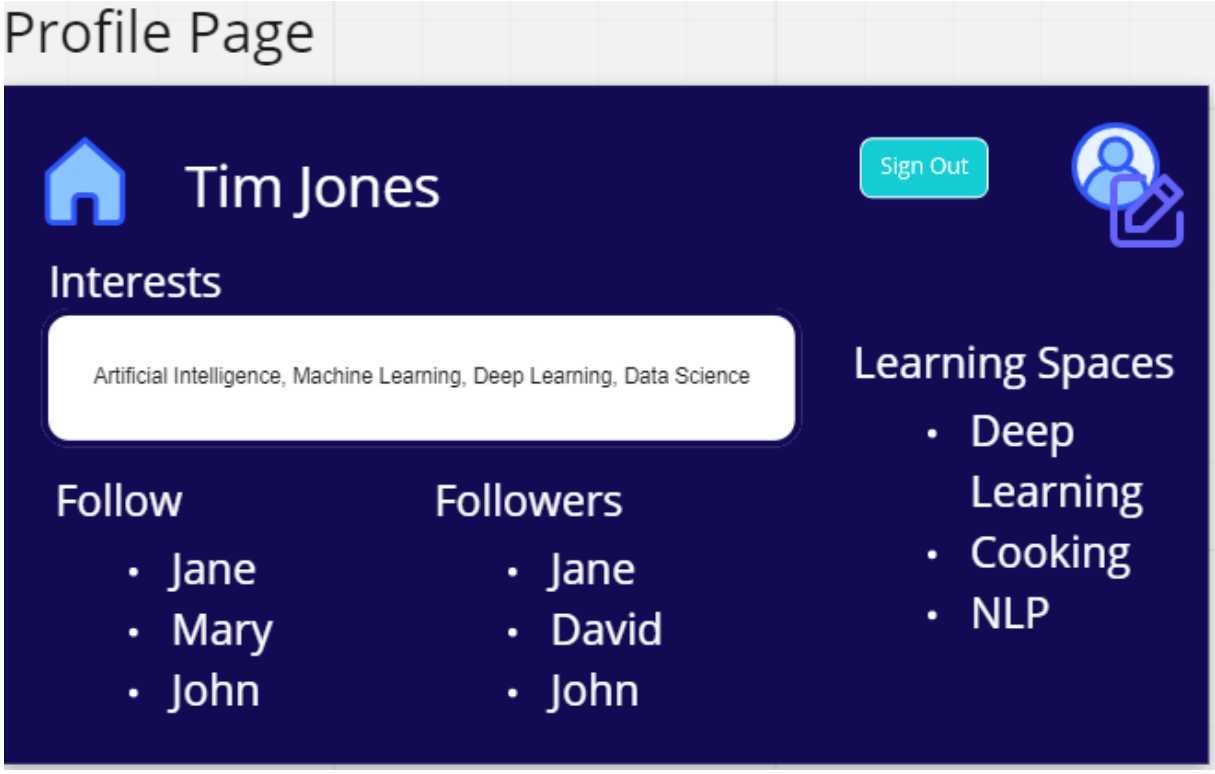
Learning Space Home Page



Learning Space RoadMap

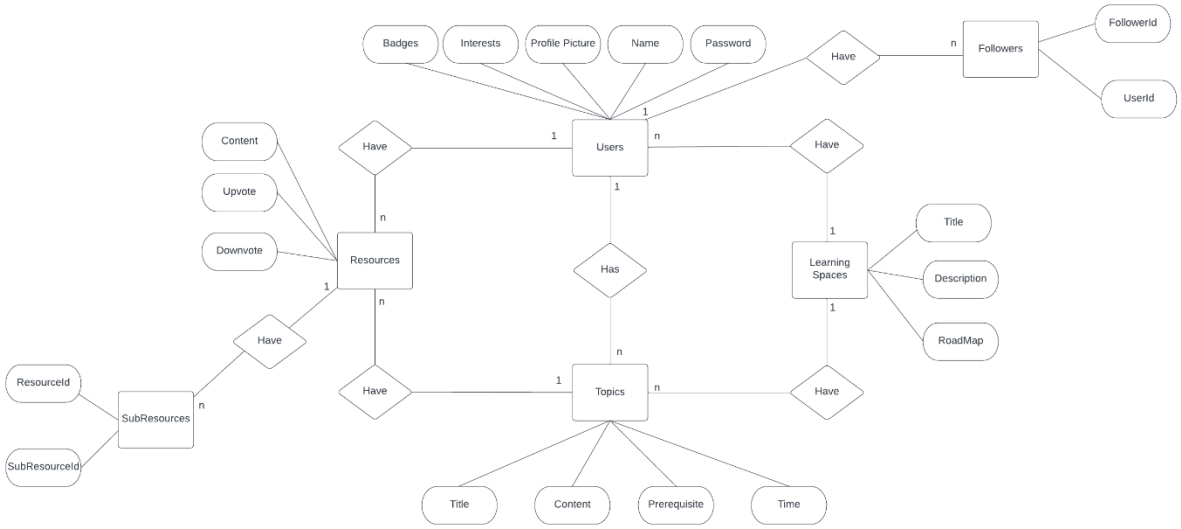


Profile Page

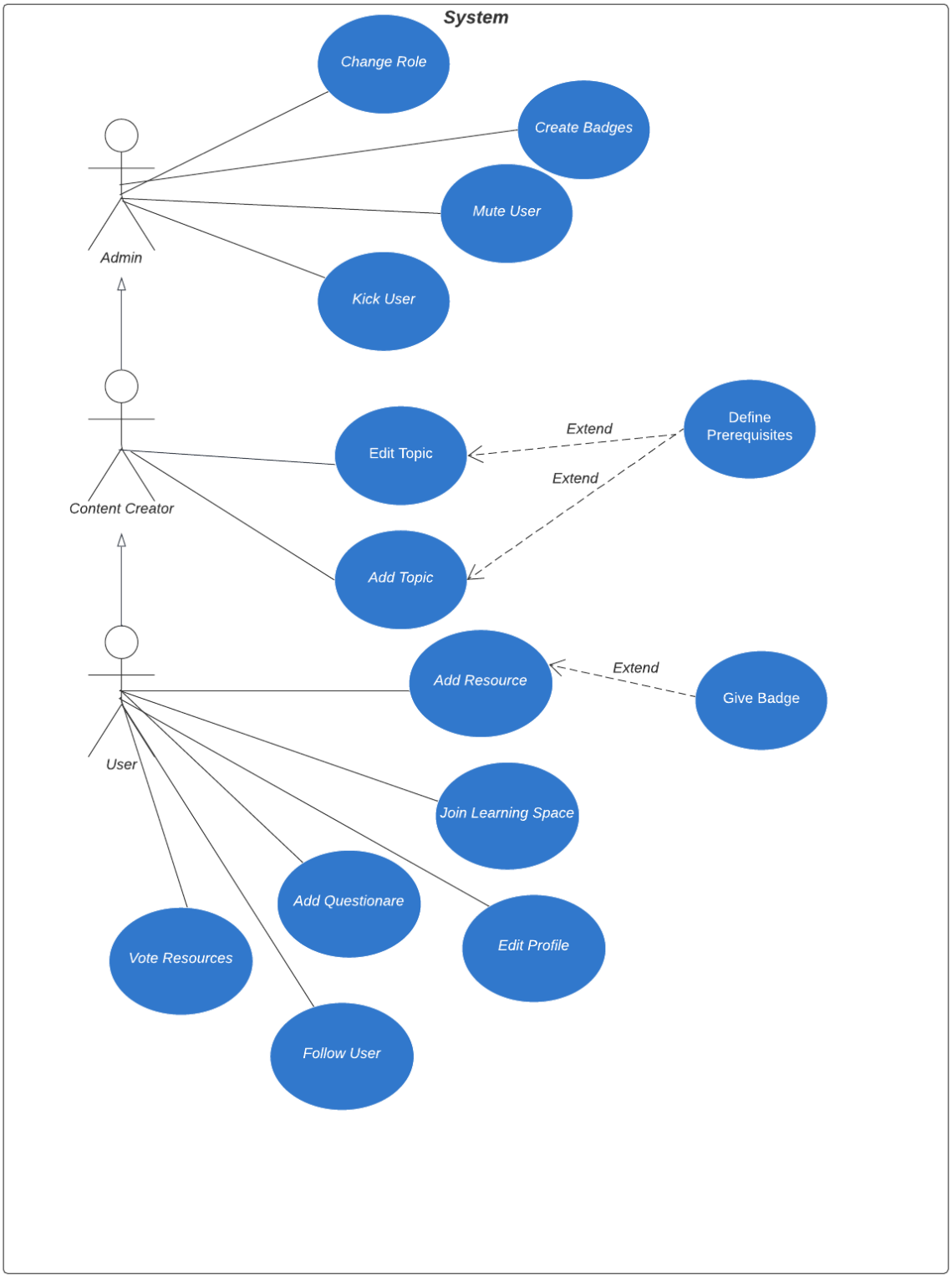


4. Design

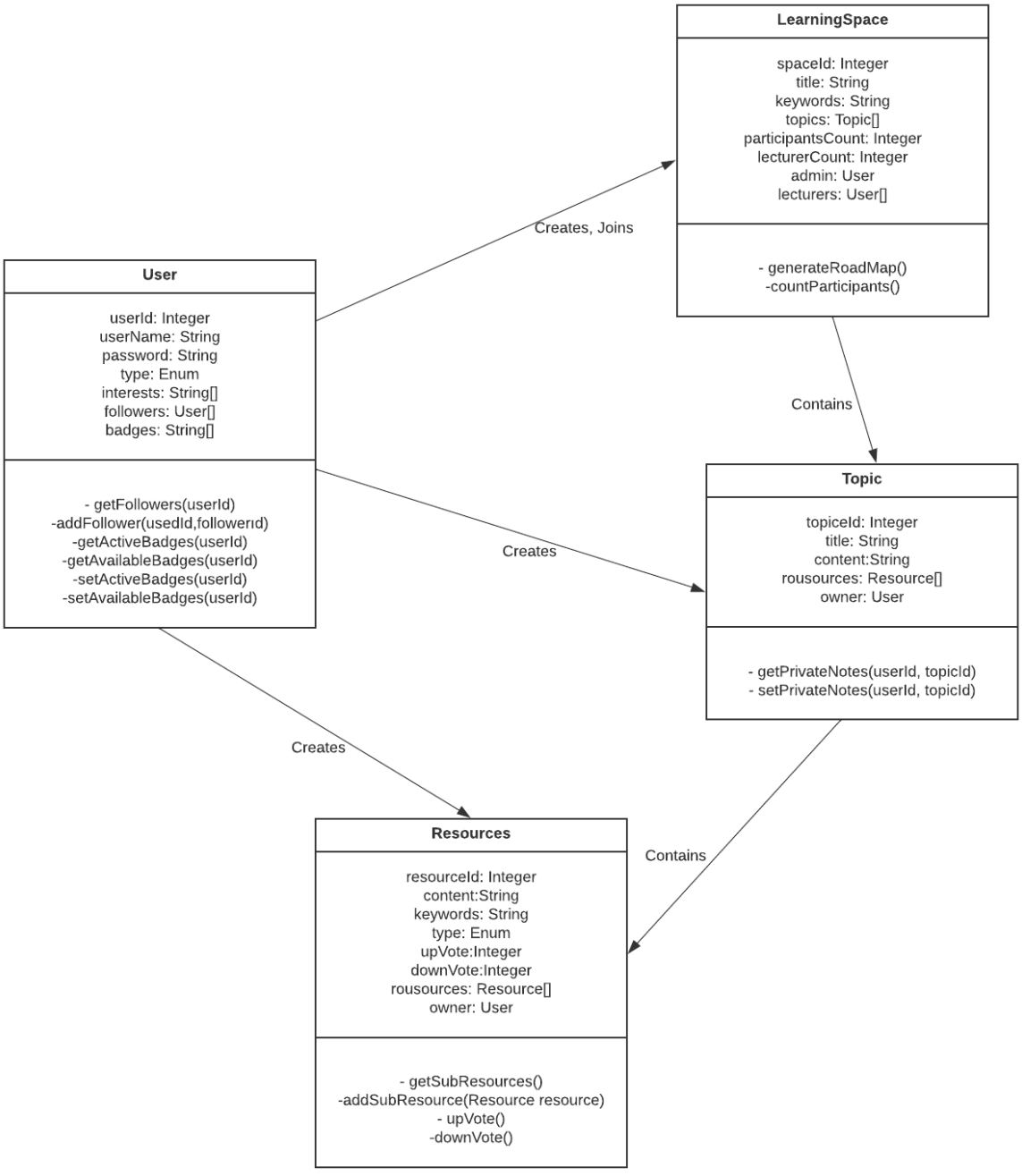
4.1 ER Diagram



4.2 Use Case Diagram



4.3 Class Diagram:



5. Status

5.1 Project Status:

Requirements	
Req1. User shall be able to create learning space.	Completed
Req2. System shall display participant, course and content creator number of the learning space.	Partially Completed
Req3. User shall be able to add topics to learning space.	Completed
Req4. User shall be able to edit topic contents.	Completed
Req5. User shall be able to modify other users' roles in learning space.	Not Completed
Req6. User shall be able to see roadmap in the learning space.	Completed
Req7. Users shall be able to add prerequisites and estimated time to the topics.	Completed
Req8. System shall update the roadmap when a new topic that has relation is added.	Completed
Req9. System shall show the estimated time, prerequisites of the topics.	Not Completed
Req10. User shall be able to add notes which are not visible to other users in the topic page.	Completed
Req11. User shall be able to add resources to the topic page.	Completed
Req12. Users shall be able to add comments to other users' resources.	Completed
Req13. Users shall be able to up vote or down vote other users' resources.	Partially Completed
Req14. System shall display up votes, down votes and resource numbers for each resource and to all users.	Partially Completed
Req15. Users shall be able to give badges to the other users.	Not Completed
Req16. Users shall be able to add special badges to their learning spaces.	Not Completed
Req17. System shall create badges.	Not Completed
Req18. System shall give badges to the users according to their activity (up vote, down votes, resources, followers)	Not Completed
Req19. Users shall be able to follow other users.	Not Completed
Req20. Users shall be able to enter interested subjects to the system.	Not Completed
Req21. Users shall be able to mute other users.	Not Completed
Req22. Users shall be able to kick other users from the learning space.	Not Completed

Req23. Users shall be able to add questionnaire to a topic.	Not Completed
Req24. Users shall be able to up vote or down vote other users' questionnaire.	Not Completed
Req25. System shall have semantic search.	Completed
Req26. System shall be a web application.	Completed
Req27. System shall implement e-mail authentication.	Not Completed
Req28. System shall use relational database.	Completed
Req29. System shall be implemented using Django.	Completed
Req30. System shall run in container.	Completed

5.2 Deployment Status:

Component	Deployed	Containerized (Docker)	Host URL
Django Web Application	Yes	Yes	http://ec2-3-91-248-125.compute-1.amazonaws.com/
MySql Database	Yes	No	database-1.c5ytoqmydx0y.us-east-1.rds.amazonaws.com

6. Manuals

6.1 System Manual

Requirements to run this system:

- Docker
- MySql Database (Local or External)

The image is located in docker hub aydosilgazi/django_colearning repository. The database parameters are defined as environment variables. Therefore, they must be stated in the docker run command.

These parameters:

- DATABASE_NAME
- DATABASE_USER
- DATABASE_PASSWORD
- DATABASE_HOST
- DATABASE_PORT

docker run -d -e DATABASE_NAME=colearning -e DATABASE_HOST=database-1.c5ytoqmydx0y.us-east-1.rds.amazonaws.com -e DATABASE_USER=admin -e DATABASE_PASSWORD=learningpass123 -e DATABASE_PORT=3306 -p 80:8000 aydosilgazi/django_colearning

This example docker run command will connect you to main database which is located in aws rds. The parameters which are defined above must be updated if a new database connection is wanted. Docker run command will start the application in default http port which is 80.

If different database parameters are given, then the tables must be created in that database. To do that following commands must be called:

- docker exec -it <containerId> python manage.py makemigrations (optional since migrations files provided in the image)
- docker exec -it <containerId> python manage.py migrate

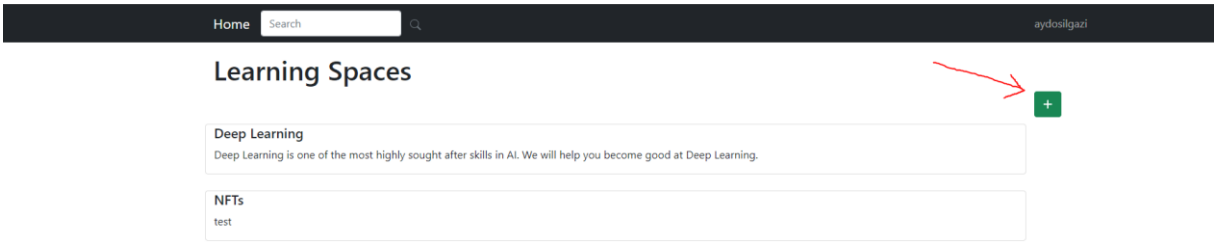
'docker ps' command will give the id information of the container.

After these steps the tables will be created and the application will be ready to use. However, the database will be empty so that it is expected main page won't show any learning spaces.

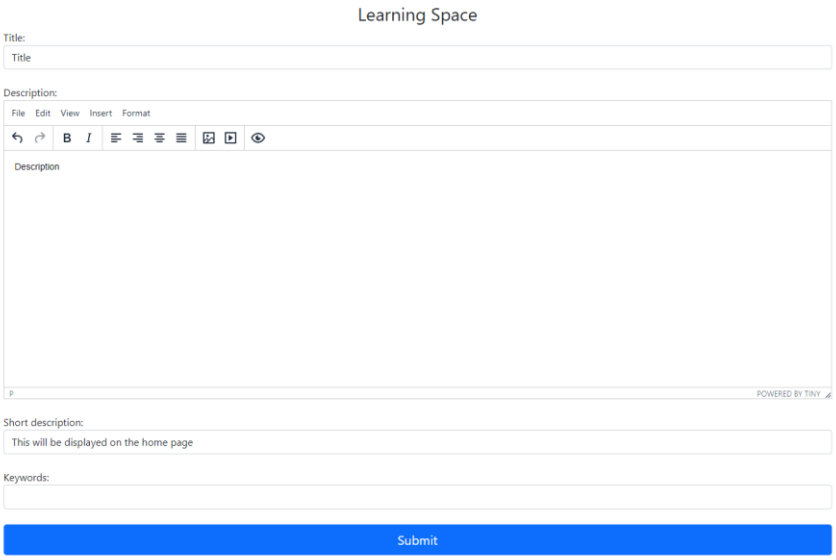
Since third party libraries and other dependencies are handled by the dockerfile and requirements.txt, these steps are enough to complete installation.

6.2 User Manual

6.2.1 Creating Learning Space

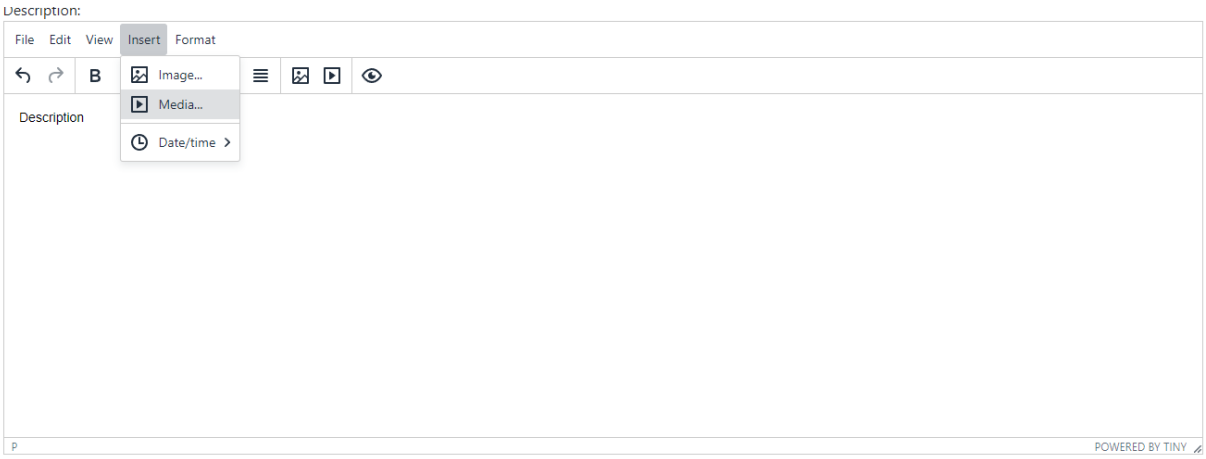


To create a learning space, click the green add button.



Fill the text boxed and click submit button.

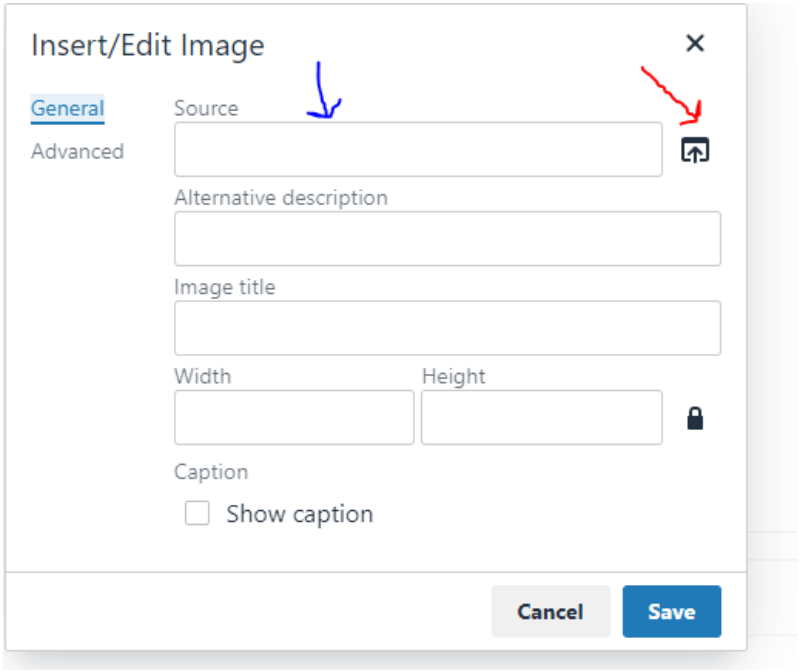
Optional:



It possible to add image or embedded videos in the description field.

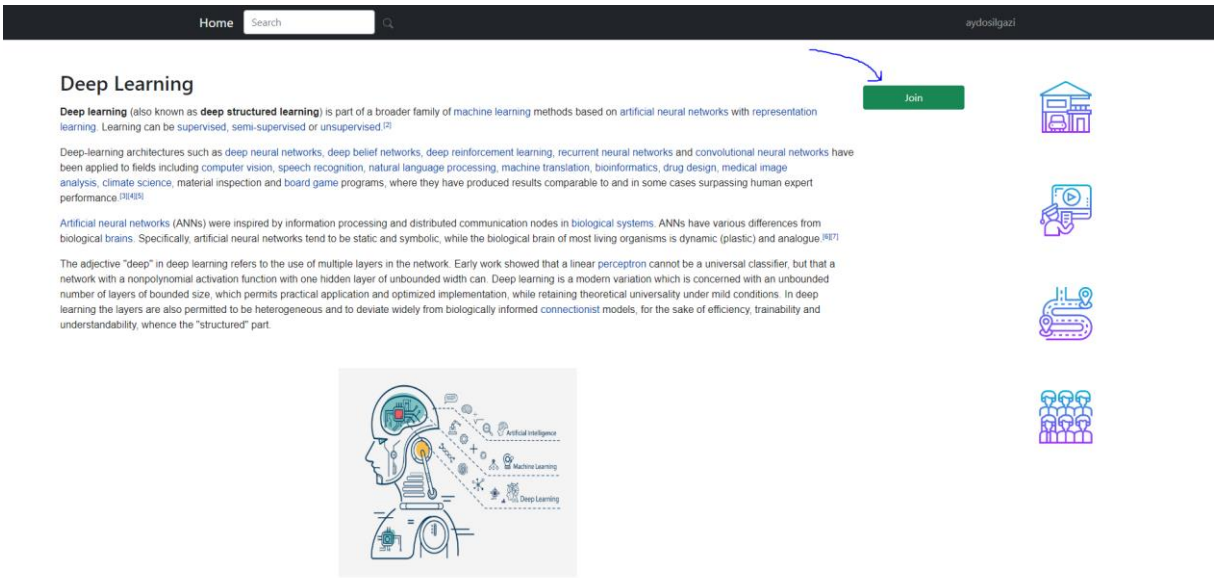
For images: Insert-> Image

For video: Insert -> Media

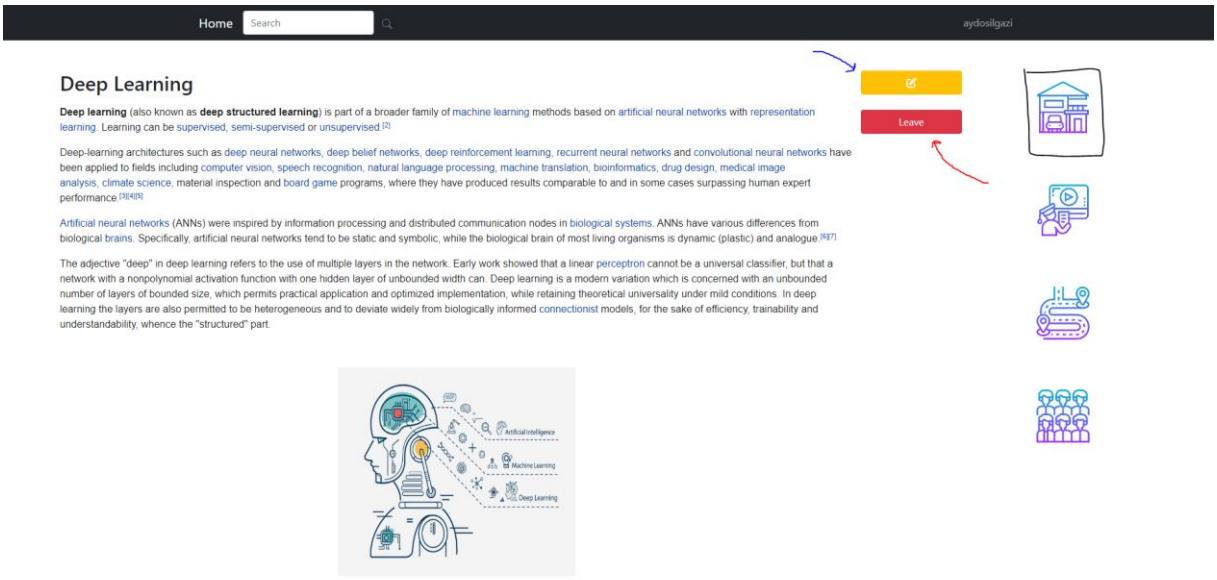


Inserting image can be done with two different ways. First, you can copy and paste an image link from the web on the text area which is shown by the blue arrow. In this operation, you don't need to download image your own computer. On the other hand, you can also upload image from your computer using the button which is shown with the red arrow.

6.2.2 Learning space home page

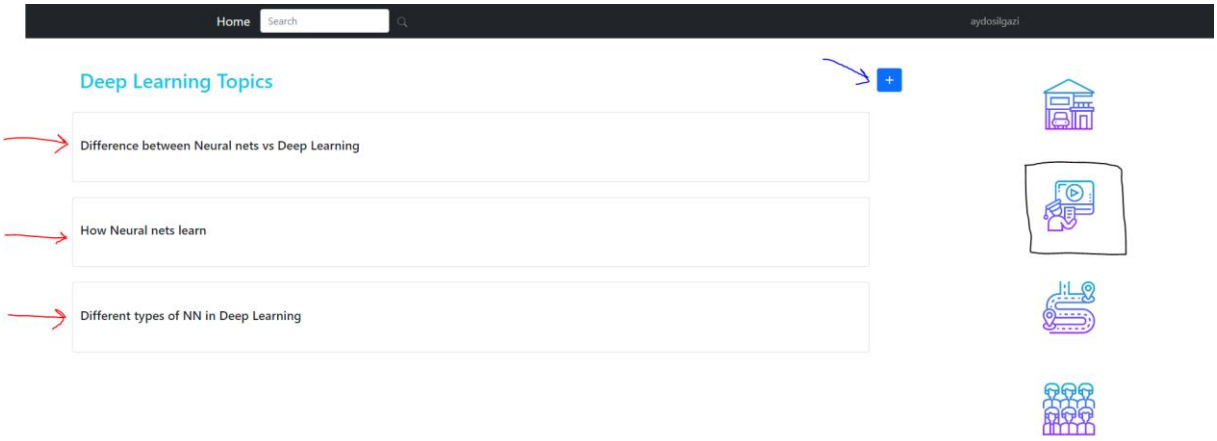


You can join a learning space by clicking the join button in the learning space's home page. When you click join, the button will be changed to edit and leave buttons.



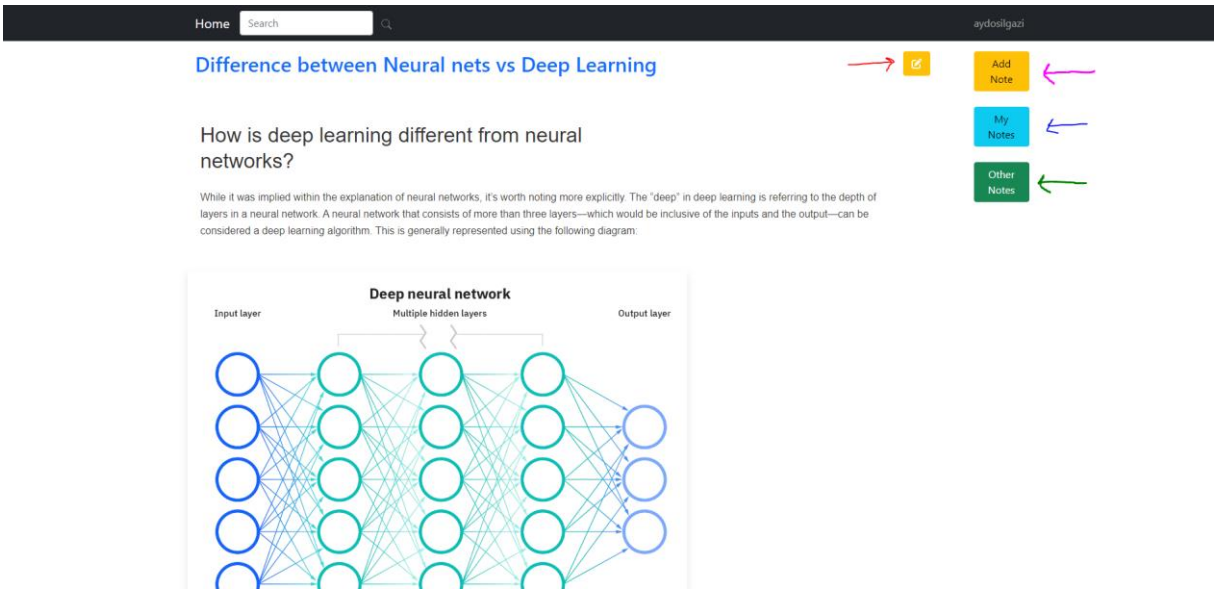
Yellow button redirects to the edit form which edits the content of displayed page. Red arrow shows the learning space leave button. On the right side bar, the home icon that is emphasized with black rectangle is another way to route this learning space home page.

6.2.3 Topics Page



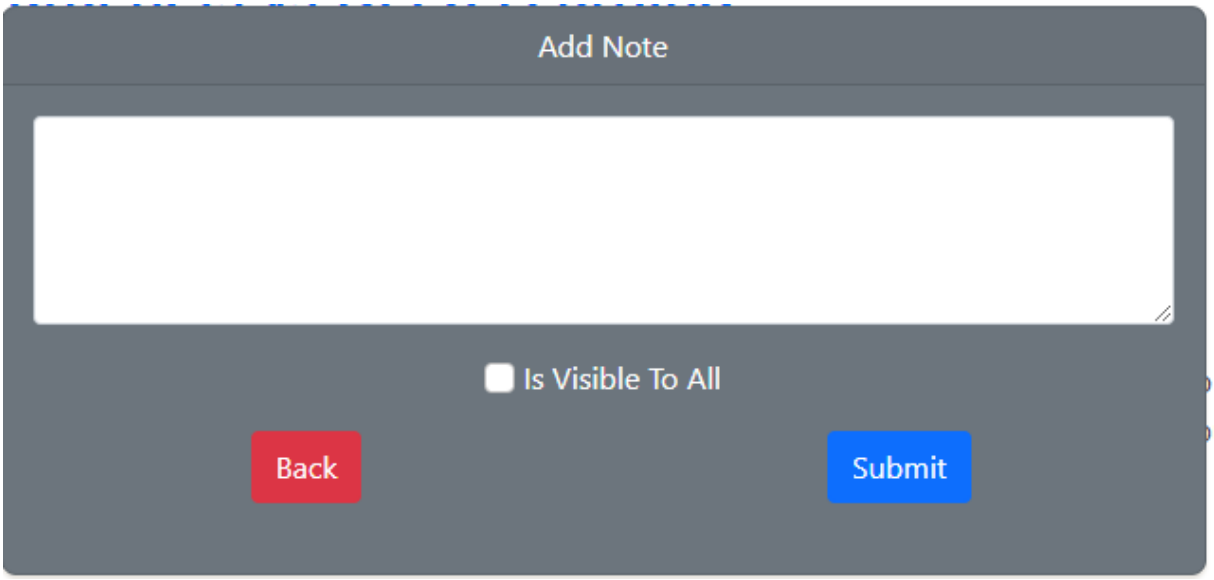
Topics page displays the existing topics in learning space. This page is accessible from the icon that is surrounded with black rectangle. Add button adds new topic to the learning space. You can click the topic name which is shown with red arrows to route corresponding topic detail page.

6.2.4 Topic Detail Page



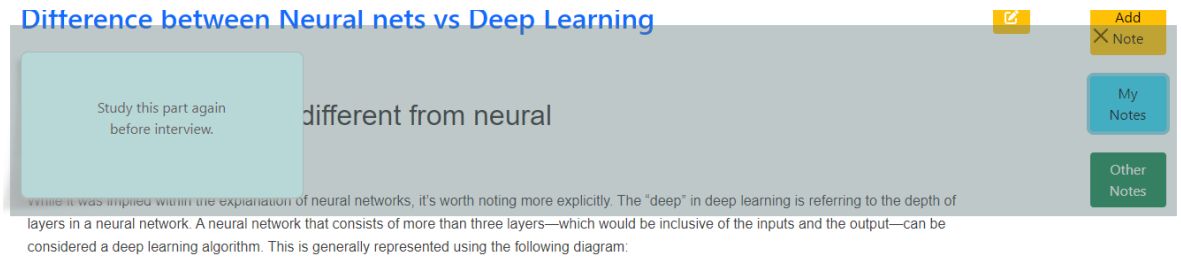
In the topic detail page, you can edit the page, add note and see the existing notes.

Add note button opens a form to add a note.

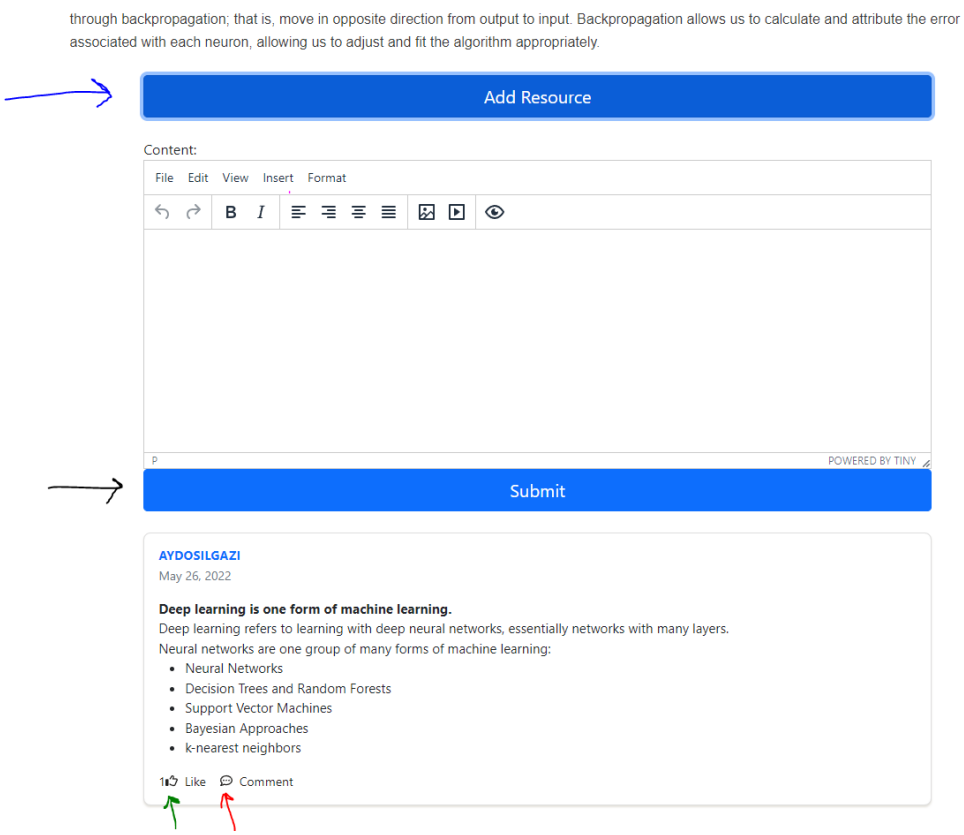


In this form, you can enter a text and select the is visible to all checkbox. If you select this, your note will be visible to the other users. If you don't, your note will be private.

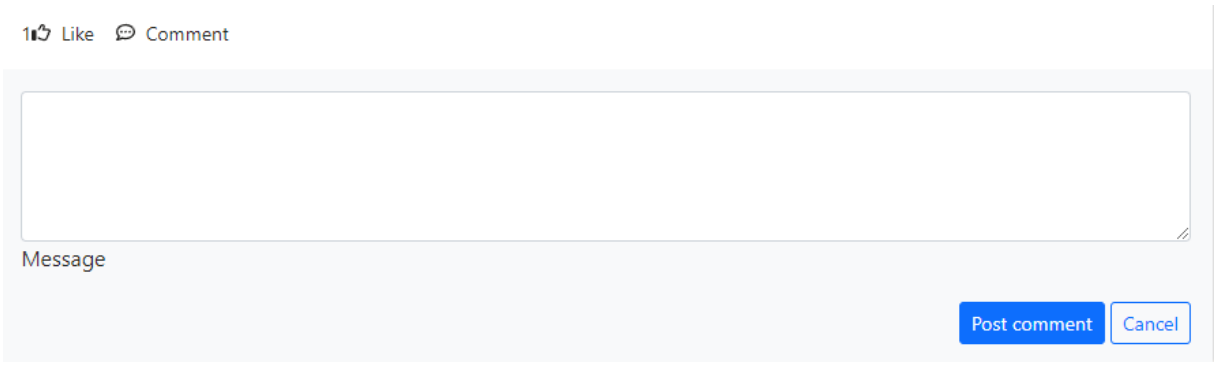
My notes button displays the notes that are created by you.



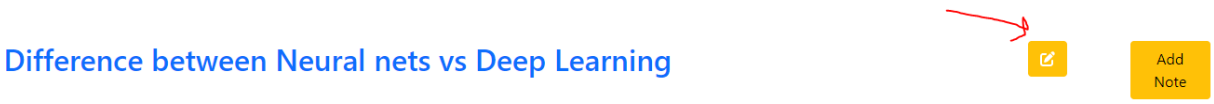
Other notes button shows the notes that are created by other users, which has ‘is visible to all’ checkbox selected.



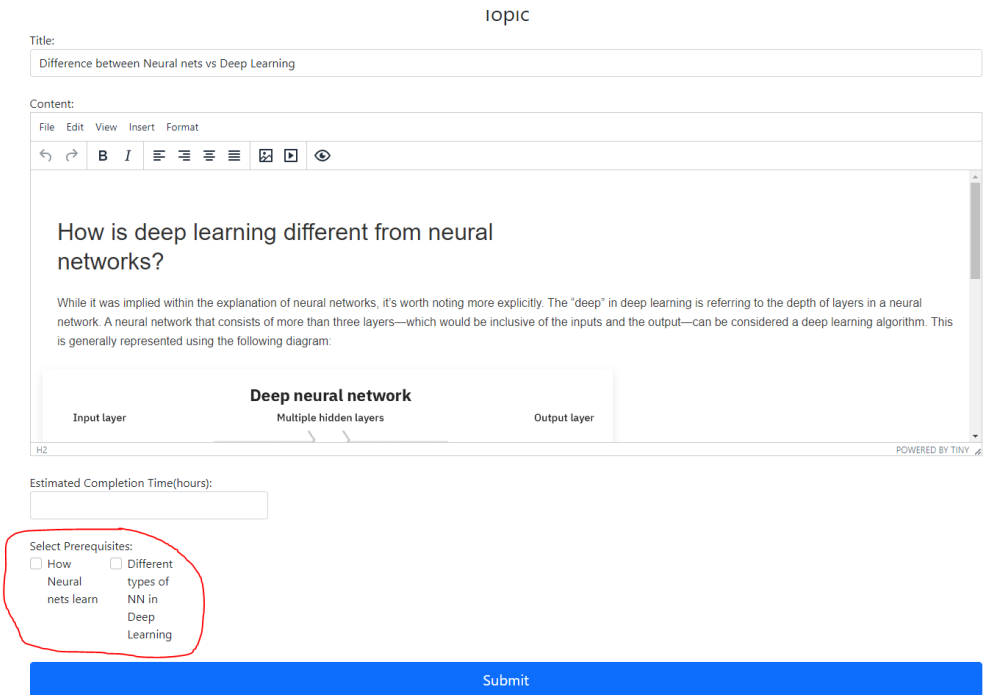
On the bottom part of the same page, there is resource section. Clicking add resource button opens a text area. Then you can add content to this area and click the submit button to share resources. The shared resources are displayed in the bottom. A user can like or comment to these resources.



Clicking comment opens new text area that accepts text messages.



Topic can be edited by clicking the edit button which is shown with red arrow.

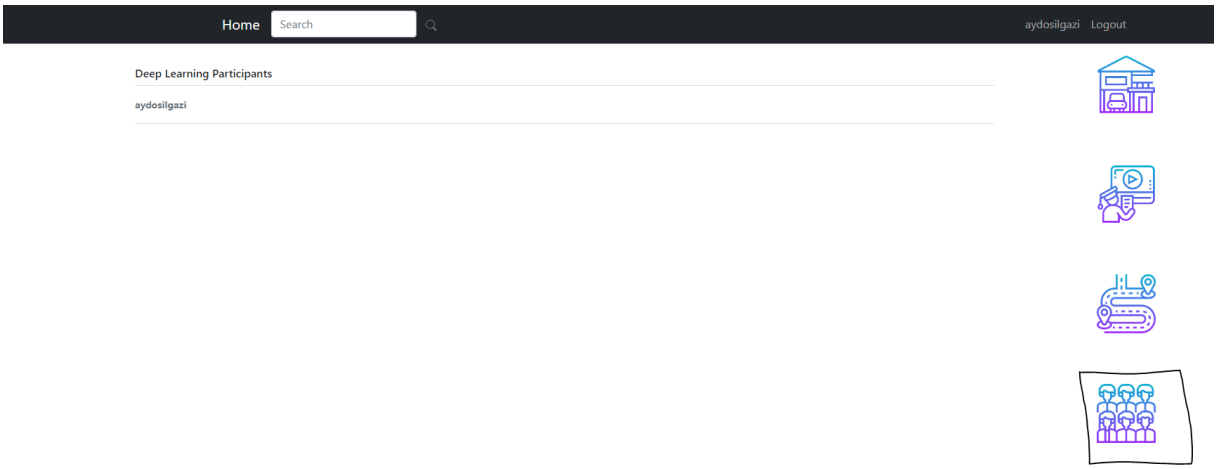


Editing the topic form is similar to editing learning space. However, it has a prerequisites area which can be selectable. These prerequisites are the other topics in same learning space. You can select any of them to create dependency between topics. If a new topic is added the learning space, this list is automatically updated and new topic becomes available to select.

6.2.5 RoadMap Page

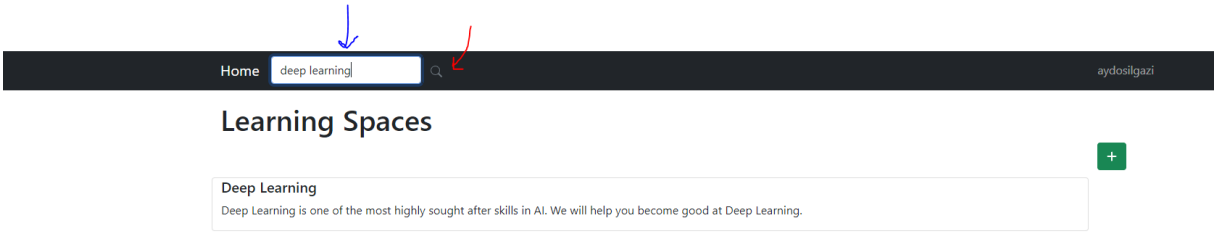
These dependencies are read from the database and drawn in the roadmap page. Road map page is accessible from the road map icon which is displayed above. When any prerequisite changes in one of the topics, this graph is updated.

6.2.6 Participants Page



Participants page displays the participants in that learning space and its accessible from the icon that is shown with black rectangle.

6.2.7 Search



Search uses the given keywords and finds related learning spaces by traversing the database.

7. Tests

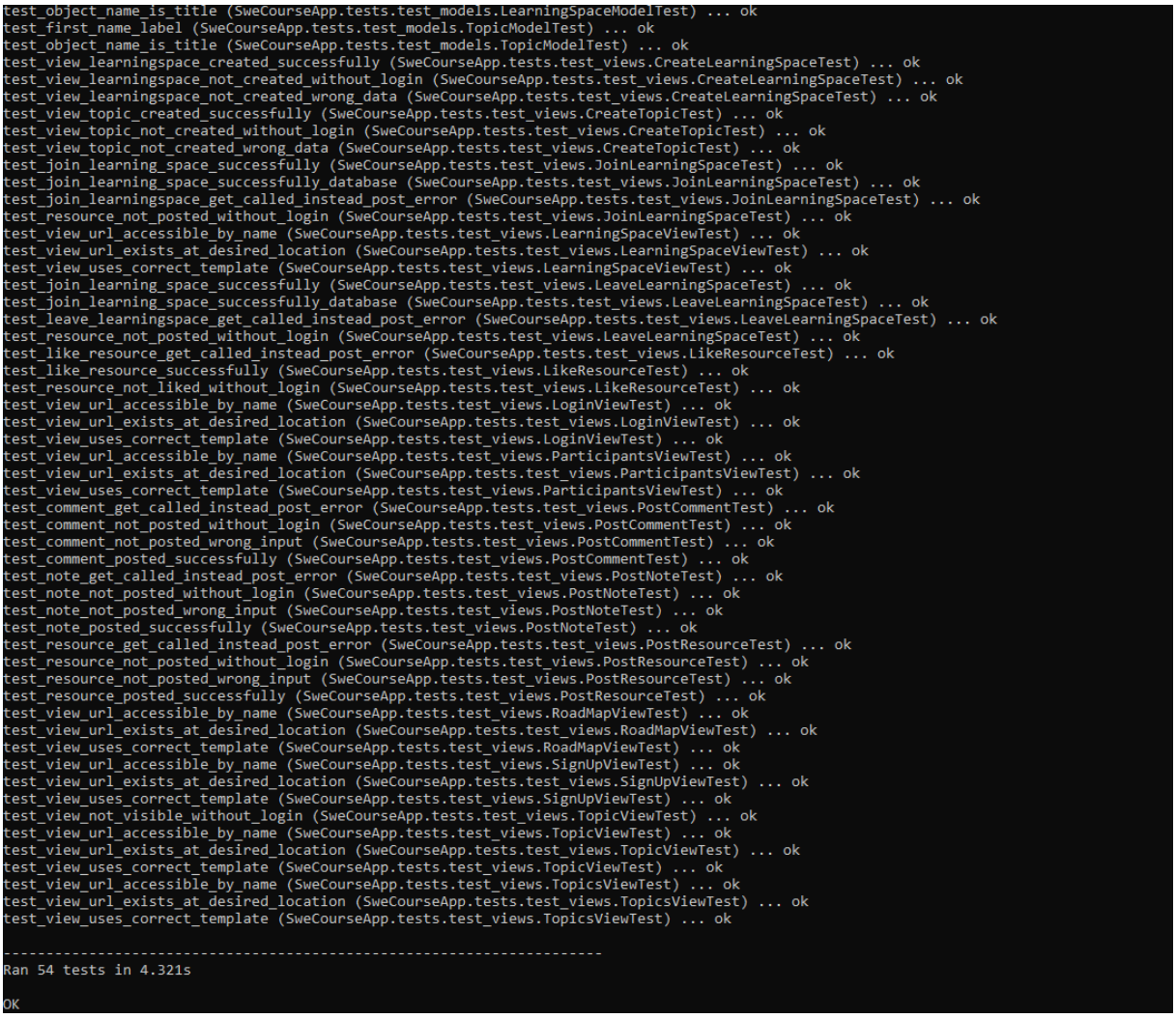
Coverage is used as a test package. %94 statement coverage is accomplished.

Test report:

Coverage report: 94%

Module	statements	missing	excluded	coverage
Swe573__init__.py	0	0	0	100%
Swe573\settings.py	25	0	0	100%
Swe573\urls.py	3	0	0	100%
SweCourseApp__init__.py	0	0	0	100%
SweCourseApp\admin.py	1	0	0	100%
SweCourseApp\apps.py	4	0	0	100%
SweCourseApp\forms.py	22	0	0	100%
SweCourseApp\migrations\0001_initial.py	6	0	0	100%
SweCourseApp\migrations\0002_test.py	4	0	0	100%
SweCourseApp\migrations\0003_topic_learningspace.py	7	0	0	100%
SweCourseApp\migrations\0004_delete_topic_rename_owner_learningspace_creator_and_more.py	4	0	0	100%
SweCourseApp\migrations\0005_learningspace_content.py	5	0	0	100%
SweCourseApp\migrations\0006_remove_learningspace_content_and_more.py	5	0	0	100%
SweCourseApp\migrations\0007_topic.py	6	0	0	100%
SweCourseApp\migrations\0008_remove_topic_duration_topic_estimated_time.py	4	0	0	100%
SweCourseApp\migrations\0009_prerequisite.py	5	0	0	100%
SweCourseApp\migrations\0010_resource.py	7	0	0	100%
SweCourseApp\migrations\0011_comment.py	6	0	0	100%
SweCourseApp\migrations\0012_comment_created_date_alter_resource_created_date.py	5	0	0	100%
SweCourseApp\migrations\0013_notes.py	6	0	0	100%
SweCourseApp\migrations\0014_likedresources_remove_choice_question_delete_test_and_more.py	6	0	0	100%
SweCourseApp\migrations\0015_learningspaceparticipation.py	6	0	0	100%
SweCourseApp\migrations__init__.py	0	0	0	100%
SweCourseApp\models.py	48	0	0	100%
SweCourseApp\tests__init__.py	0	0	0	100%
SweCourseApp\tests\test_models.py	26	0	0	100%
SweCourseApp\tests\test_views.py	285	0	0	100%
SweCourseApp\urls.py	5	0	0	100%
SweCourseApp\views.py	211	39	0	82%
manage.py	12	2	0	83%
Total	**724**	**41**	**0**	**94%**

Total 54-unit tests are implemented in the test_views.py and test_models.py.



Besides developed unit tests, application is also tested by using it on different scenarios. Detected bugs are transformed to open issues to fix them in future releases.