

# Project Report

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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 Ilgazi

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# 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:

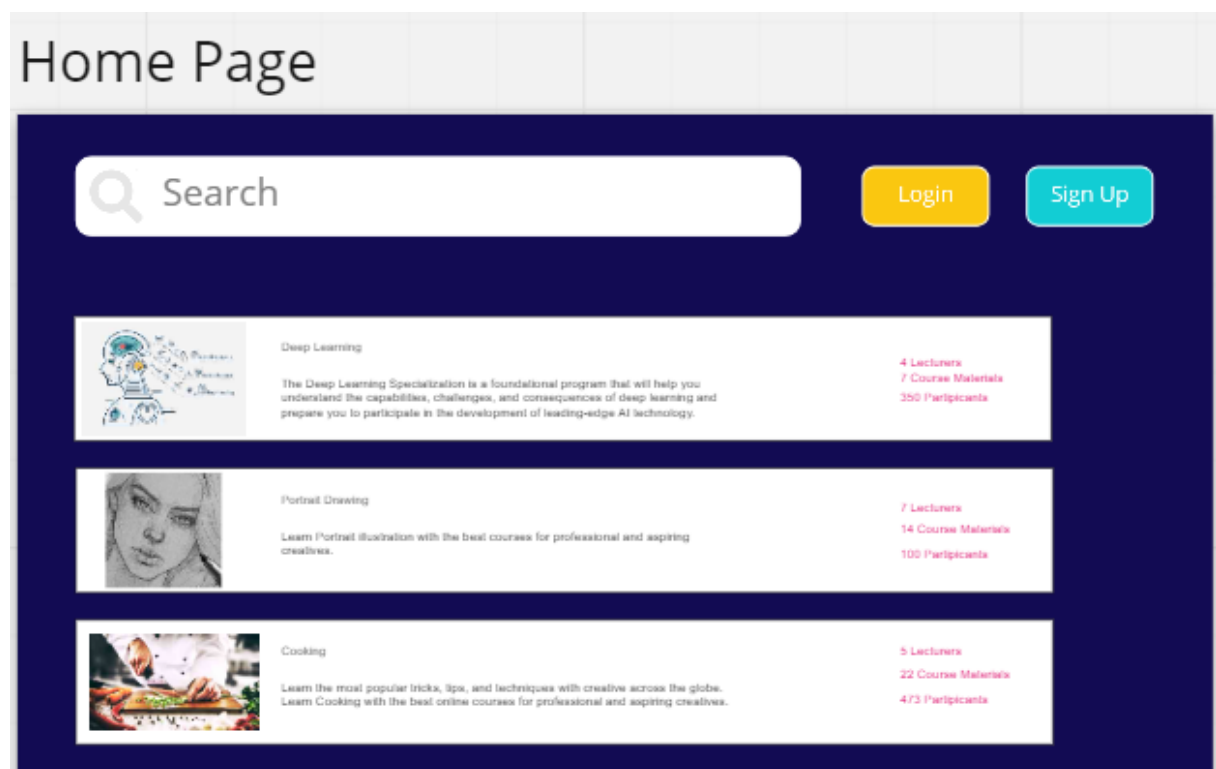
- No experience with Django
- Unpredictable workload that comes from other classes

## 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

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



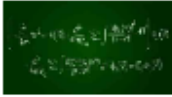
### Artificial Intelligence

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

17 Course Materials

73 Participants

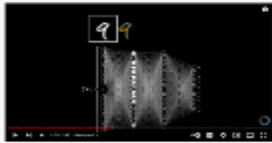
# Learning Space - Course

Sign Out



## Convolutional Neural Networks


Convolutional Neural Networks


In [deep learning](#), a convolutional neural network (CNN, or ConvNet) is a class of [artificial neural networks](#) (ANN), most commonly applied to analyze visual imagery [1]. They are also known as Shift Invariant or Space Invariant Artificial Neural Networks (SIANN), based on the shared-weight architecture of the convolution kernels or filters that slide along input features and provide translation-[equivariant](#) responses known as feature maps [2,3]. Counter-intuitively, most convolutional neural networks are only [equivariant](#), as opposed to [invariant](#), to translation [4]. They have applications in [image and video recognition](#), [document analysis](#), [image classification](#), [image segmentation](#), [medical image analysis](#), [natural language processing](#) [5] [brain-computer interfaces](#) [7] and financial [time series](#) [2].



It is an interesting fact when you do x, you can also manage to handle y state.



 78  3  27




 5  0  7

Add

learning space home




roadmap




courses







Jarman



Martin





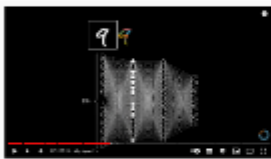
Sign Out


## Convolutional Neural Networks

learning space home

Convolutional Neural Networks

In [deep learning](#), a convolutional neural network (CNN, or ConvNet) is a class of [artificial neural networks](#) (ANNs), most commonly applied to analyze visual imagery [1]. They are also known as Shift Invariant or Space Invariant Artificial Neural Networks (SIANN), based on the shared-weight architecture of the convolution kernels or filters that slide along input features and provide translation-[equivariant](#) responses known as feature maps [2,3]. Counter-intuitively, most convolutional neural networks are only [equivariant](#), as opposed to [invariant](#), to translation [4]. They have applications in [image and video recognition](#), [recommendation systems](#), [5] [image classification](#), [image segmentation](#), [medical image analysis](#), [natural language processing](#) [6] [speech-computer interfaces](#) [7] and financial [data science](#) [8].



Private note

Save Cancel

Note 1

Note 2

Note 3



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

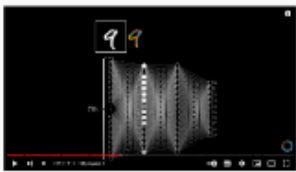
 roadmap
  courses

 James
  Martin


## Learning Space - Course Cont...

[Sign Out](#)


In global neural networks are only [equivariant](#), as opposed to [invariant](#), to translation.[4]  
They have applications in [image and video recognition](#), [recommender systems](#),[5] [image classification](#), [image segmentation](#), [medical image analysis](#), [natural language processing](#),[6] [brain-computer interfaces](#),[7] and financial [time series](#). [8]




learning space home



roadmap




courses



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


Very helpful representation of CNN's

Thank you for the graph martin. Can we also say ... ?






James




Martin




Jane

[Submit](#)[Cancel](#)

## Learning Space - Create Course



[Sign Out](#)



[Content creator](#)

### Deep Learning Add Course

Recurrent Neural Networks

4-8 hours estimated

A recurrent neural network (RNN) is a type of artificial neural network which uses sequential data or time series data. These deep learning algorithms are commonly used for ordinal or temporal problems, such as language translation, natural language processing (nlp), speech recognition, and image captioning; they are incorporated into popular applications such as Siri, voice search, and Google Translate. Like feedforward and convolutional neural networks (CNNs), recurrent neural networks utilize training data to learn.



Prerequisites

☐ Neural Networks and Deep Learning

☒ Convolutional Neural Networks

☐ Sequence Models

☐ Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization

[Submit](#)[Cancel](#)

[learning space home](#)




[roadmap](#)




[courses](#)



## Learning Space Home Page



[Sign Out](#)

# Deep Learning

[#Ai](#), [#DeepLearning](#), [#MachineLearning](#), ...

4 Lecturers  
7 Course Materials  
350 Participants

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.

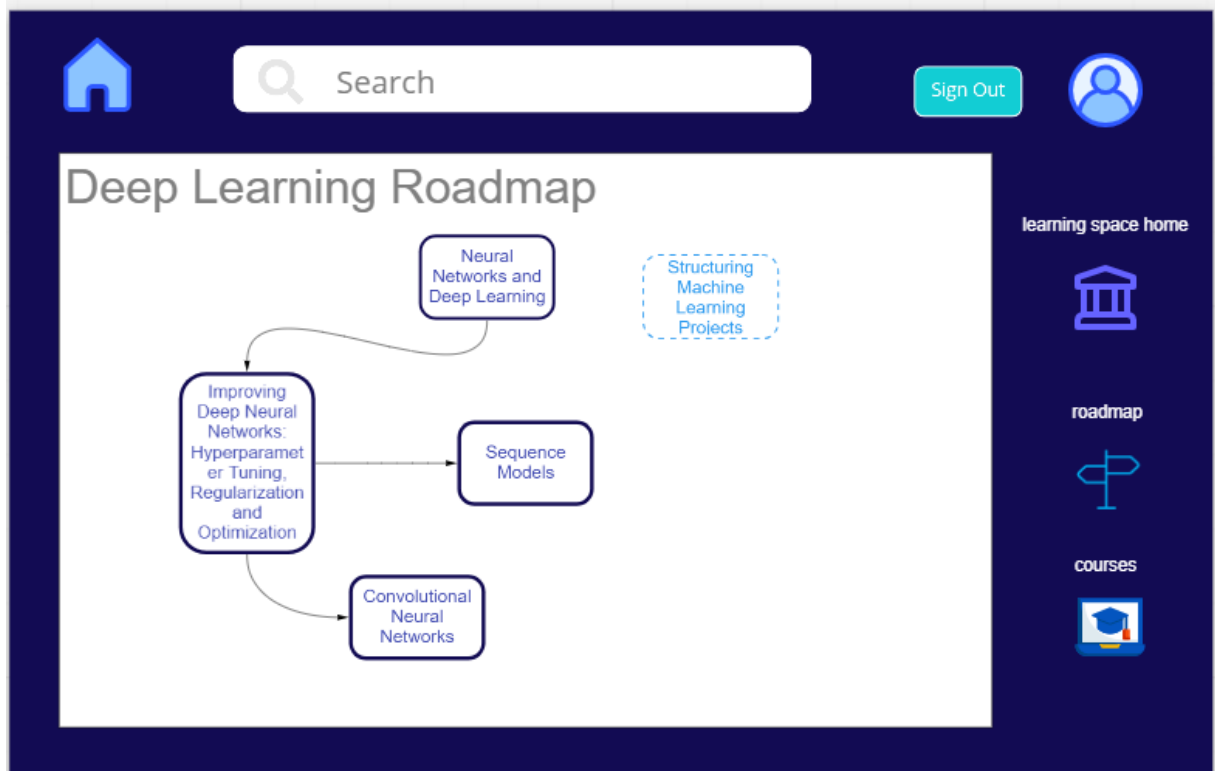
[Join](#)

[learning space home](#)

[roadmap](#)

[courses](#)

## Learning Space RoadMap



## Profile Page

Tim Jones

Sign Out

Interests

Artificial Intelligence, Machine Learning, Deep Learning, Data Science

Follow

- Jane
- Mary
- John

Followers

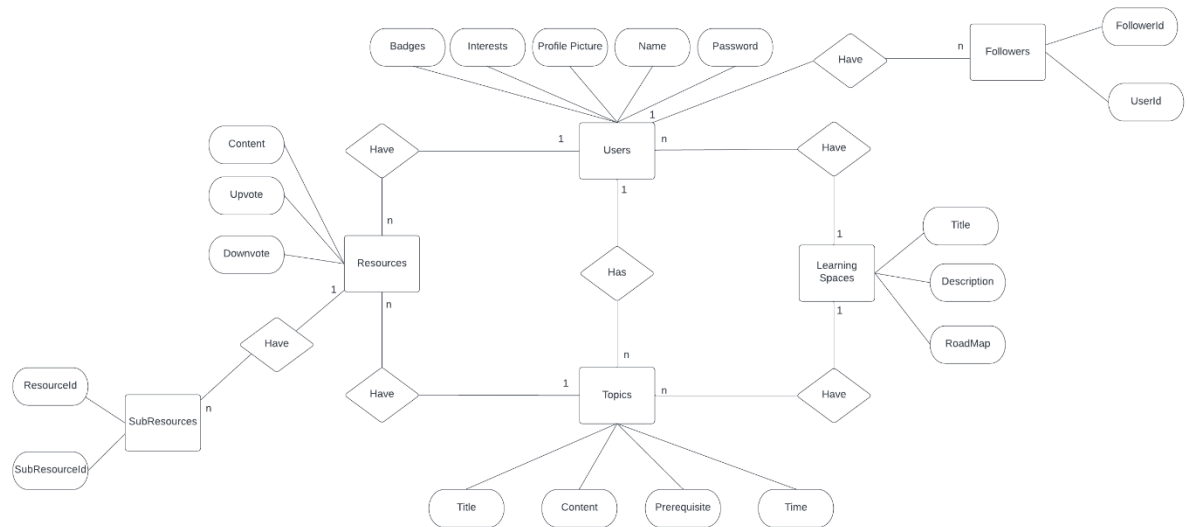
- Jane
- David
- John

Learning Spaces

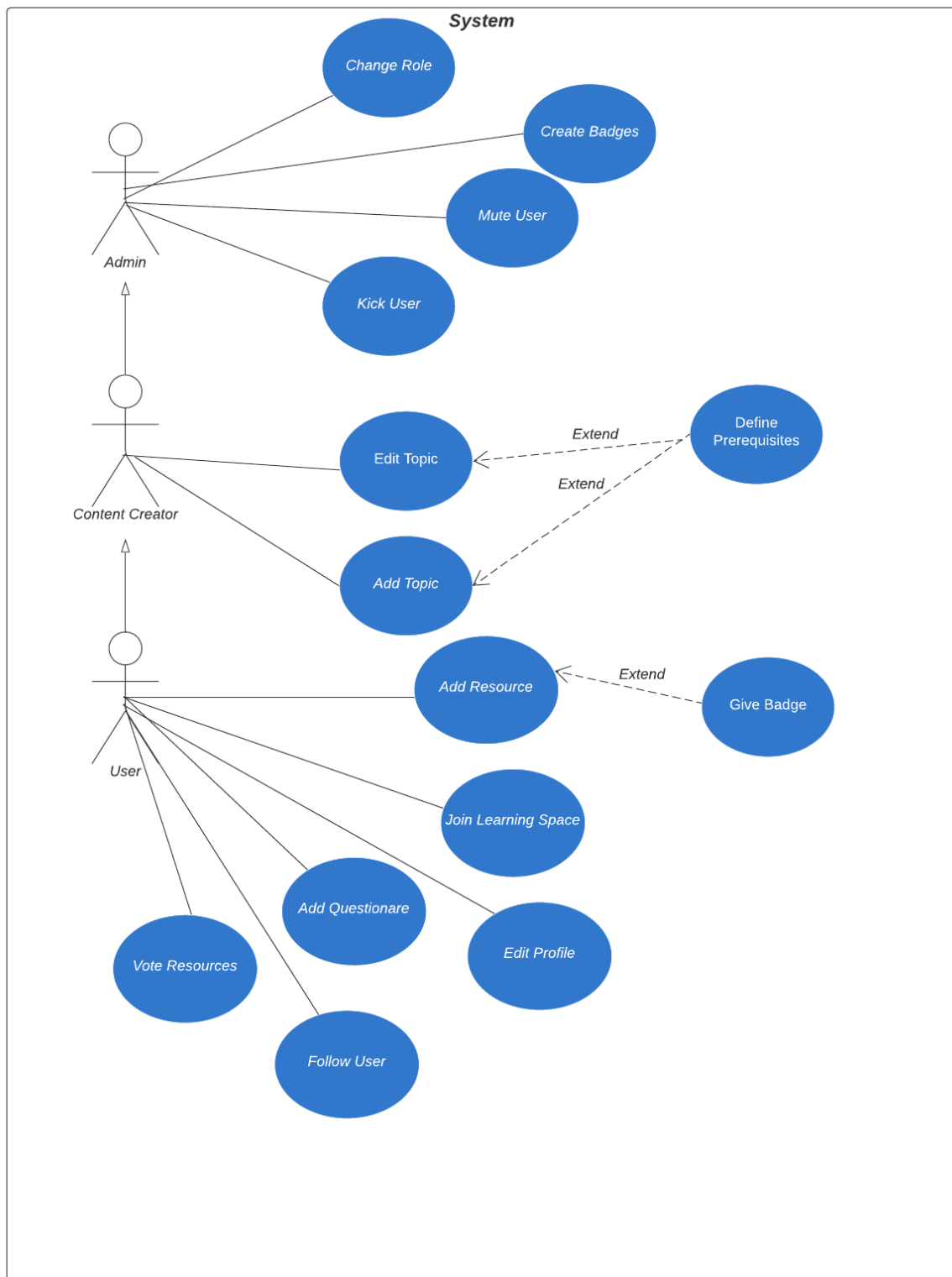
- Deep Learning
- Cooking
- NLP

## 4. Design

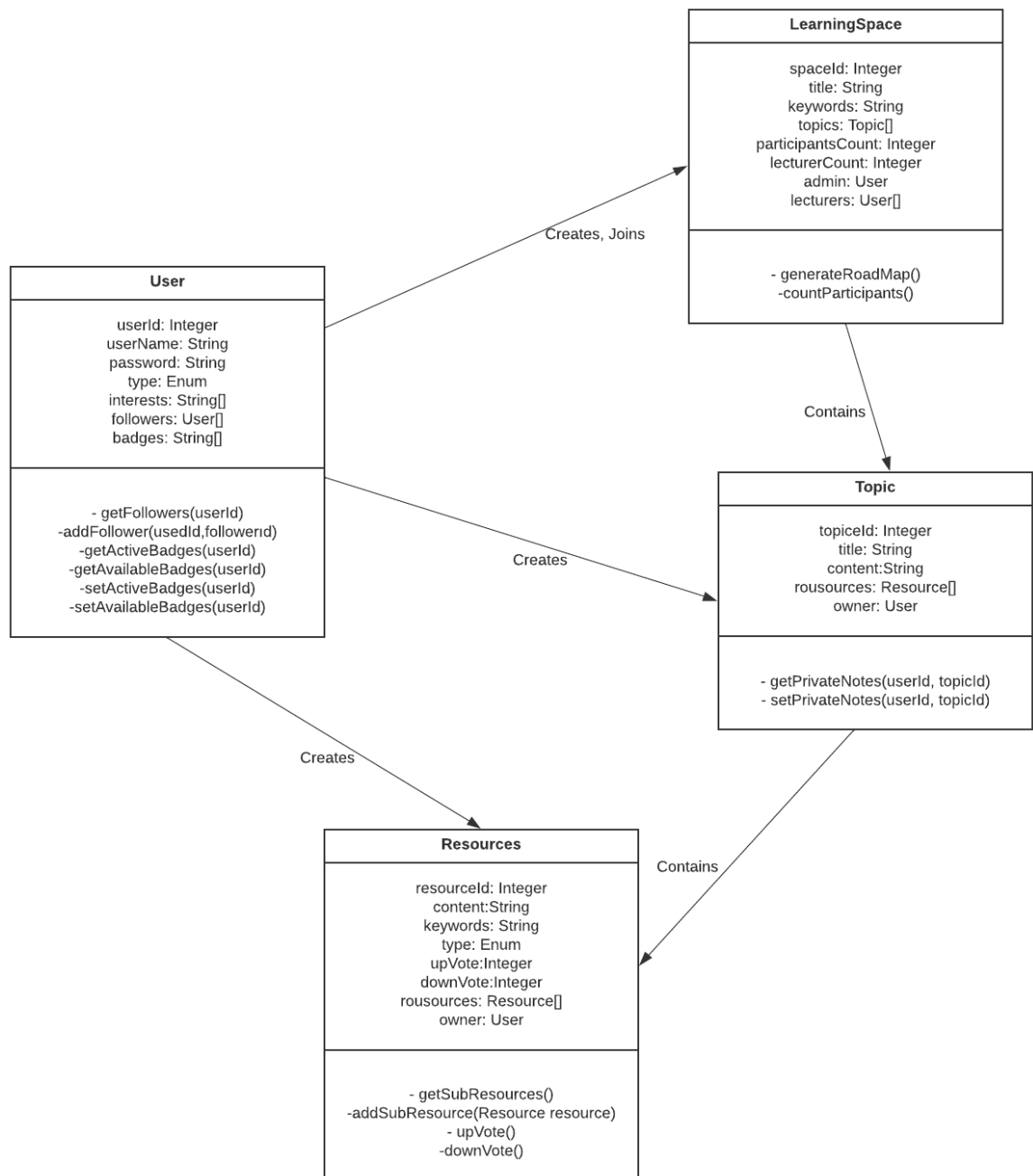
### 4.1 ER Diagram



## 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`

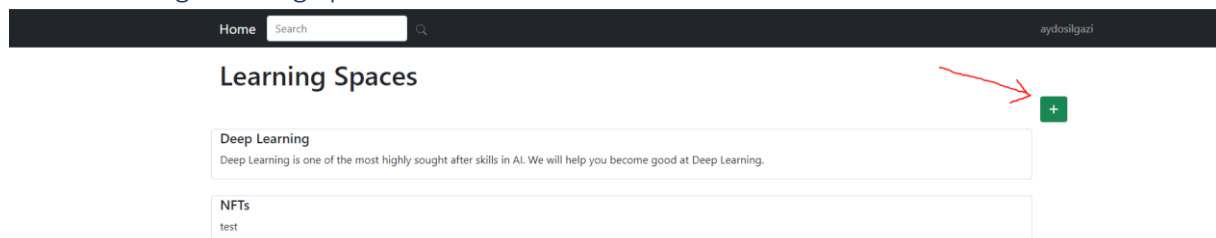
'docker ps' command will give the id information of the container.

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.

Learning Space

Title:

Title

Description:

File Edit View Insert Format

↶ ↷ B I [List] [Link] [Image] [Video] [Eye]

Description

P POWERED BY TINY

Short description:

This will be displayed on the home page

Keywords:

Submit

Fill the text boxed and click submit button.

Optional:

Description:

File Edit View Insert Format

↶ ↷ B [Image...] [List] [Link] [Image] [Video] [Eye]

[Media...]

Date/time >

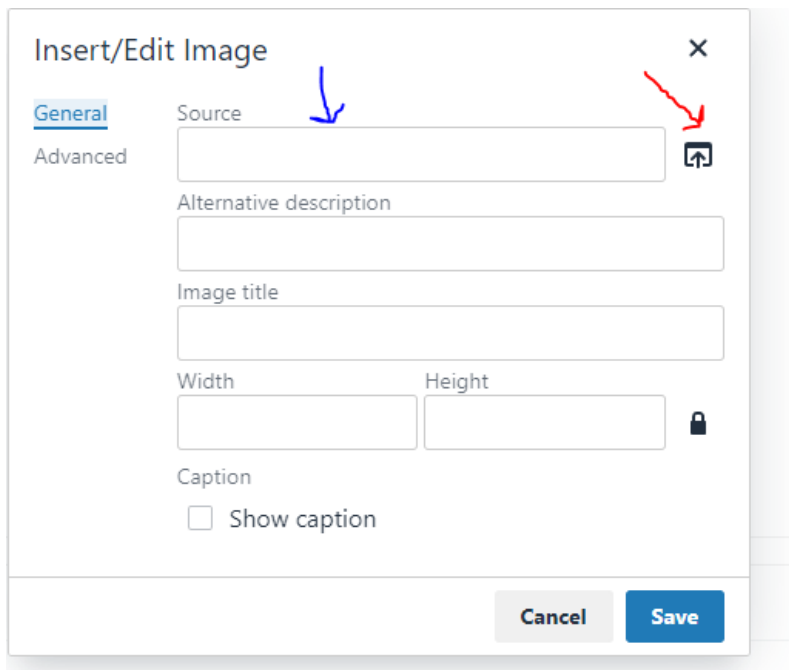
Description

P POWERED BY TINY

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

For images: Insert-> Image

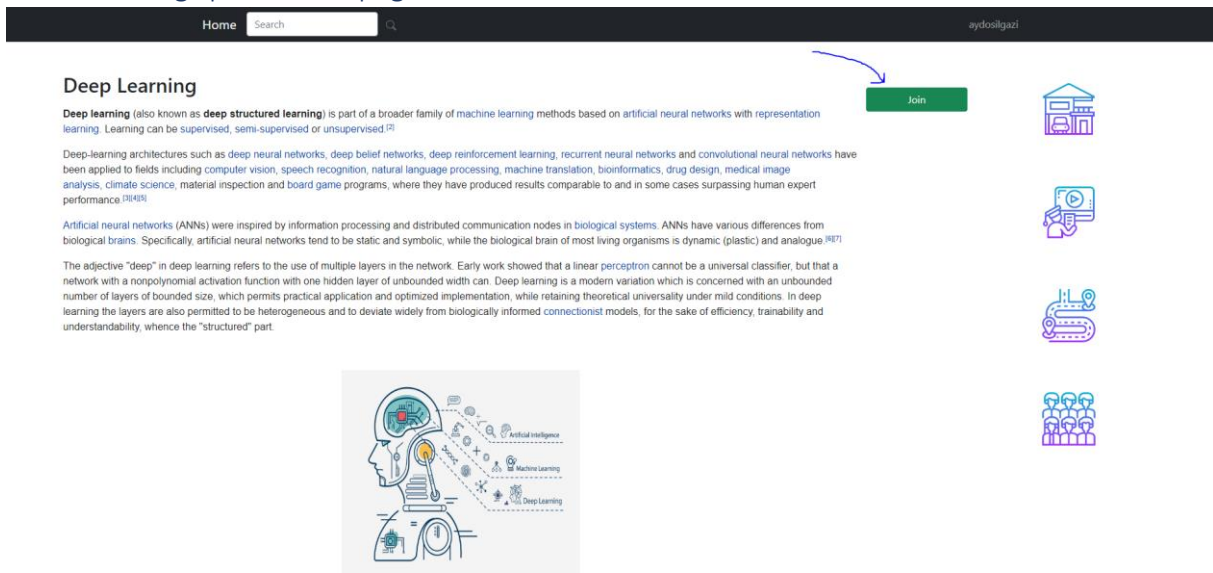
For video: Insert -> Media



The dialog box is titled "Insert/Edit Image" and has a close button (X) in the top right corner. It contains two tabs: "General" (selected) and "Advanced". Under the "General" tab, there are several input fields: "Source" (with a blue arrow pointing to it), "Alternative description", "Image title", "Width", and "Height" (with a lock icon). There is also a "Caption" section with a checkbox labeled "Show caption". At the bottom right, there are "Cancel" and "Save" buttons. A red arrow points to an upload icon (a square with an upward arrow) located next to the "Source" field.

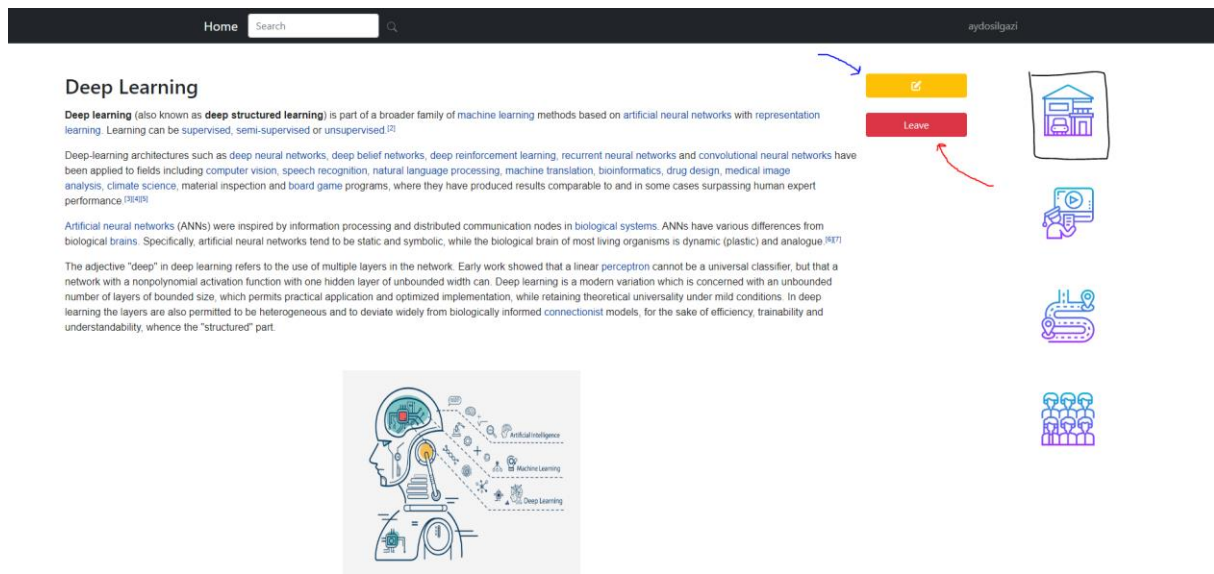
Inserting image can be done with two different ways. First, you can copy and paste an image link from the web on the text area which is shown by the blue arrow. In this operation, you don't need to download image your own computer. On the other hand, you can also upload image from your computer using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

## 6.2.2 Learning space home page



The image shows the home page of a learning space. At the top, there is a dark navigation bar with "Home" and "Search" links, and a user profile icon labeled "aydosilgazi". Below the navigation bar, the main content area is titled "Deep Learning". It contains a paragraph of text about deep learning, followed by a "Join" button (highlighted with a blue arrow). To the right of the text, there are four icons: a building, a play button, a gear, and a group of people. At the bottom, there is a large illustration of a human head with gears and a brain, labeled "Artificial Intelligence", "Machine Learning", and "Deep Learning".

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

Home

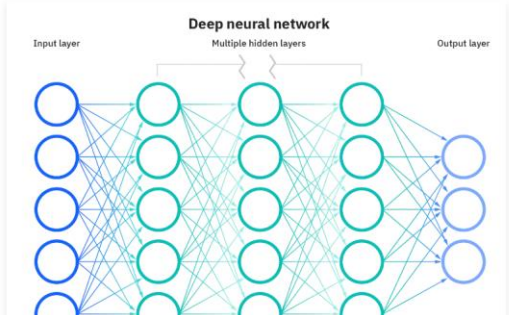
Search

aydosilgazi

[Difference between Neural nets vs Deep Learning](#)

How is deep learning different from neural networks?

While it was implied within the explanation of neural networks, it's worth noting more explicitly. The "deep" in deep learning is referring to the depth of layers in a neural network. A neural network that consists of more than three layers—which would be inclusive of the inputs and the output—can be considered a deep learning algorithm. This is generally represented using the following diagram:



Add Note

My Notes

Other Notes

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.

Add Note

☐ Is Visible To All

Back

Submit

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.

[Difference between Neural nets vs Deep Learning](#)

Study this part again before interview.

How is deep learning different from neural networks?

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Add Note

My Notes

Other Notes

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

through backpropagation; that is, move in opposite direction from output to input. Backpropagation allows us to calculate and attribute the error associated with each neuron, allowing us to adjust and fit the algorithm appropriately.

The image shows a web interface for adding resources. At the top, a blue button labeled 'Add Resource' is pointed to by a blue arrow. Below it is a text editor with a menu (File, Edit, View, Insert, Format) and a toolbar with icons for undo, redo, bold, italic, text color, background color, bulleted list, numbered list, link, unlink, and image. A black arrow points to a blue 'Submit' button below the editor. Below the submit button is a card for a resource. The card has the title 'AYDOSILGAZI' and the date 'May 26, 2022'. The content of the card is: **Deep learning is one form of machine learning.** Deep learning refers to learning with deep neural networks, essentially networks with many layers. Neural networks are one group of many forms of machine learning: 

- Neural Networks
- Decision Trees and Random Forests
- Support Vector Machines
- Bayesian Approaches
- k-nearest neighbors

 At the bottom of the card, there are 'Like' and 'Comment' buttons. A green arrow points to the 'Like' button and a red arrow points to the 'Comment' button.

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.

The image shows a comment form. At the top, there are 'Like' and 'Comment' buttons. Below the buttons is a large text area for writing a message. At the bottom of the text area, the word 'Message' is displayed. To the right of the text area are two buttons: 'Post comment' and 'Cancel'.

Clicking comment opens new text area that accepts text messages.

## Difference between Neural nets vs Deep Learning

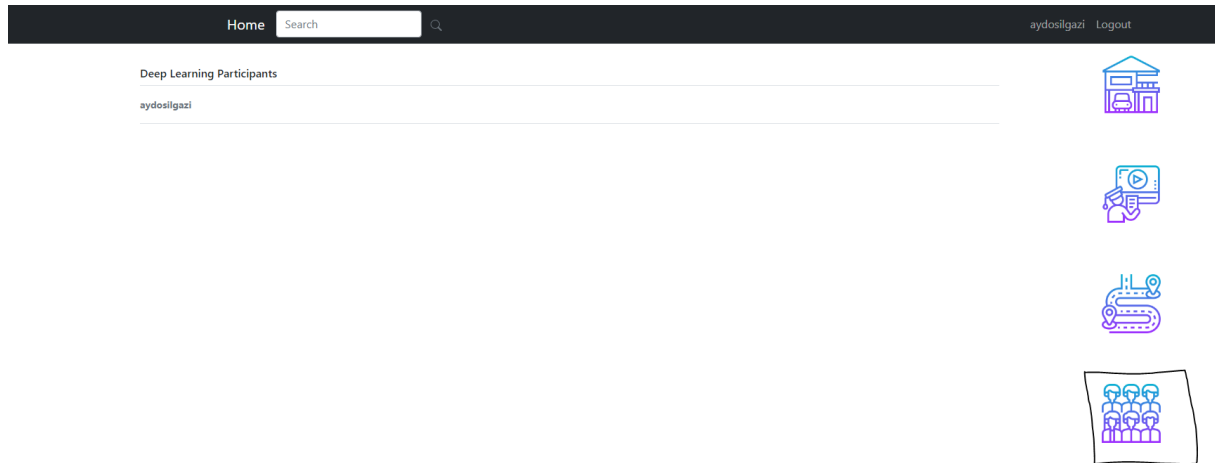


Topic can be edited by clicking the edit button which is shown with red arrow.



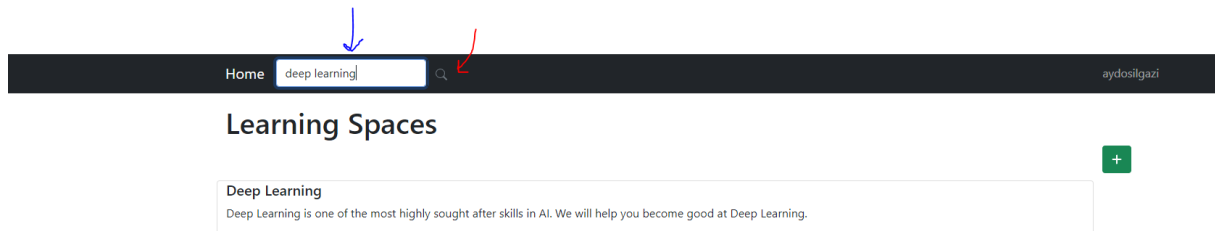


## 6.2.6 Participants Page



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_learning_space.py	7	0	0	100%
SweCourseApp\migrations\0004_delete_topic_rename_owner_learning_space_creator_and_more.py	4	0	0	100%
SweCourseApp\migrations\0005_learning_space_content.py	5	0	0	100%
SweCourseApp\migrations\0006_remove_learning_space_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_liked_resources_remove_choice_question_delete_test_and_more.py	6	0	0	100%
SweCourseApp\migrations\0015_learning_space_participation.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.

```

test_object_name_is_title (SweCourseApp.tests.test_models.LearningSpaceModelTest) ... ok
test_first_name_label (SweCourseApp.tests.test_models.TopicModelTest) ... ok
test_object_name_is_title (SweCourseApp.tests.test_models.TopicModelTest) ... ok
test_view_learning_space_created_successfully (SweCourseApp.tests.test_views.CreateLearningSpaceTest) ... ok
test_view_learning_space_not_created_without_login (SweCourseApp.tests.test_views.CreateLearningSpaceTest) ... ok
test_view_learning_space_not_created_wrong_data (SweCourseApp.tests.test_views.CreateLearningSpaceTest) ... ok
test_view_topic_created_successfully (SweCourseApp.tests.test_views.CreateTopicTest) ... ok
test_view_topic_not_created_without_login (SweCourseApp.tests.test_views.CreateTopicTest) ... ok
test_view_topic_not_created_wrong_data (SweCourseApp.tests.test_views.CreateTopicTest) ... ok
test_join_learning_space_successfully (SweCourseApp.tests.test_views.JoinLearningSpaceTest) ... ok
test_join_learning_space_not_created_wrong_data (SweCourseApp.tests.test_views.JoinLearningSpaceTest) ... ok
test_join_learning_space_get_called_instead_post_error (SweCourseApp.tests.test_views.JoinLearningSpaceTest) ... ok
test_resource_not_posted_without_login (SweCourseApp.tests.test_views.JoinLearningSpaceTest) ... ok
test_view_url_accessible_by_name (SweCourseApp.tests.test_views.LearningSpaceViewTest) ... ok
test_view_url_exists_at_desired_location (SweCourseApp.tests.test_views.LearningSpaceViewTest) ... ok
test_view_uses_correct_template (SweCourseApp.tests.test_views.LearningSpaceViewTest) ... ok
test_join_learning_space_successfully database (SweCourseApp.tests.test_views.LearningSpaceViewTest) ... ok
test_leave_learning_space_get_called_instead_post_error (SweCourseApp.tests.test_views.LearningSpaceViewTest) ... ok
test_resource_not_posted_without_login (SweCourseApp.tests.test_views.LearningSpaceViewTest) ... ok
test_like_resource_get_called_instead_post_error (SweCourseApp.tests.test_views.LikeResourceTest) ... ok
test_like_resource_successfully (SweCourseApp.tests.test_views.LikeResourceTest) ... ok
test_resource_not_liked_without_login (SweCourseApp.tests.test_views.LikeResourceTest) ... ok
test_view_url_accessible_by_name (SweCourseApp.tests.test_views.LoginViewTest) ... ok
test_view_url_exists_at_desired_location (SweCourseApp.tests.test_views.LoginViewTest) ... ok
test_view_uses_correct_template (SweCourseApp.tests.test_views.LoginViewTest) ... ok
test_view_url_accessible_by_name (SweCourseApp.tests.test_views.ParticipantsViewTest) ... ok
test_view_url_exists_at_desired_location (SweCourseApp.tests.test_views.ParticipantsViewTest) ... ok
test_view_uses_correct_template (SweCourseApp.tests.test_views.ParticipantsViewTest) ... ok
test_comment_get_called_instead_post_error (SweCourseApp.tests.test_views.PostCommentTest) ... ok
test_comment_not_posted_without_login (SweCourseApp.tests.test_views.PostCommentTest) ... ok
test_comment_not_posted_wrong_input (SweCourseApp.tests.test_views.PostCommentTest) ... ok
test_comment_posted_successfully (SweCourseApp.tests.test_views.PostCommentTest) ... ok
test_note_get_called_instead_post_error (SweCourseApp.tests.test_views.PostNoteTest) ... ok
test_note_not_posted_without_login (SweCourseApp.tests.test_views.PostNoteTest) ... ok
test_note_not_posted_wrong_input (SweCourseApp.tests.test_views.PostNoteTest) ... ok
test_resource_get_called_instead_post_error (SweCourseApp.tests.test_views.PostResourceTest) ... ok
test_resource_not_posted_without_login (SweCourseApp.tests.test_views.PostResourceTest) ... ok
test_resource_not_posted_wrong_input (SweCourseApp.tests.test_views.PostResourceTest) ... ok
test_resource_posted_successfully (SweCourseApp.tests.test_views.PostResourceTest) ... ok
test_view_url_accessible_by_name (SweCourseApp.tests.test_views.RoadMapViewTest) ... ok
test_view_url_exists_at_desired_location (SweCourseApp.tests.test_views.RoadMapViewTest) ... ok
test_view_uses_correct_template (SweCourseApp.tests.test_views.RoadMapViewTest) ... ok
test_view_url_accessible_by_name (SweCourseApp.tests.test_views.SignUpViewTest) ... ok
test_view_url_exists_at_desired_location (SweCourseApp.tests.test_views.SignUpViewTest) ... ok
test_view_uses_correct_template (SweCourseApp.tests.test_views.SignUpViewTest) ... ok
test_view_not_visible_without_login (SweCourseApp.tests.test_views.TopicViewTest) ... ok
test_view_url_accessible_by_name (SweCourseApp.tests.test_views.TopicViewTest) ... ok
test_view_url_exists_at_desired_location (SweCourseApp.tests.test_views.TopicViewTest) ... ok
test_view_uses_correct_template (SweCourseApp.tests.test_views.TopicViewTest) ... ok
test_view_url_accessible_by_name (SweCourseApp.tests.test_views.TopicsViewTest) ... ok
test_view_url_exists_at_desired_location (SweCourseApp.tests.test_views.TopicsViewTest) ... ok
test_view_uses_correct_template (SweCourseApp.tests.test_views.TopicsViewTest) ... ok
-----
Ran 54 tests in 4.321s
OK

```

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.