VISVESVARAYA TECHNOLOGICAL UNIVERSITY JNANA SANGAMA,
BELAGAVI, KARNATAKA 590018

LAB MANUAL

FULL STACK DEVELOPMENT
21CS62

Children's Education Society ®
The Oxford College of Engineering
Department of Computer Science and Engineering.

Full Stack Development Laboratory

Subject Code: 21CS62 **I.A. Marks: 20**

Hours/Week: 03 **Total Hours: 20**

LIST OF PROGRAMS

Sl. No.	Name of Experiment
1.	a. Installation of Python, Django and Visual Studio code editors can be demonstrated. b. Creation of virtual environment, Django project and App should be demonstrated c. Develop a Django app that displays current date and time in server d. Develop a Django app that displays date and time four hours ahead and four hours before as an offset of current date and time in server.
2.	a. Develop a simple Django app that displays an unordered list of fruits and ordered list of selected students for an event b. Develop a layout.html with a suitable header (containing navigation menu) and footer with copyright and developer information. Inherit this layout.html and create 3 additional pages: contact us, About Us and Home page of any website. c. Develop a Django app that performs student registration to a course. It should also display list of students registered for any selected course. Create students and course as models with enrolment as ManyToMany field.
3.	a. For student and course models created in Lab experiment for Module2, register admin interfaces, perform migrations and illustrate data entry through admin forms. b. Develop a Model form for student that contains his topic chosen for project, languages used and duration with a model called project.
4.	a. For students enrolment developed in Module 2, create a generic class view which displays list of students and detailview that displays student details for any selected student in the list. b. Develop example Django app that performs CSV and PDF generation for any models created in previous laboratory component.
5.	1. Develop a registration page for student enrolment as done in Module 2 but without page refresh using AJAX. 2. Develop a search application in Django using AJAX that displays courses enrolled by a student being searched.

Full Stack Development Laboratory

Subject Code: 21CS62 **I.A. Marks: 20**

Hours/Week: 02 **Total Hours: 20**

SCHEDULE OF EXPERIMENTS

Sl. No	Name of Experiment	WEEK
1	Sample programs	Week1
2	Sample programs	Week2
3	Installation of python,Django and VS code, Creation of virtual environment Django Project and App.	Week3
4	Display Current Date and Time in Server.	Week4
5	Display Current Date and Time four hours ahead and four hours before in server.	Week5
6	Django app that displays an unordered list of fruits and ordered list of selected students for an event	Week6
7	Inherit this layout.html and create 3 additional pages: contact us, About Us and Home page of any website.	Week7
8	Django app that performs student registration to a course. It should also display list of students registered for any selected course. Create students and course as models with enrolment as ManyToMany field.	Week8
9	a. For student and course models created in Lab experiment for Module2, register admin interfaces, perform migrations and illustrate data entry through admin forms b. Develop a Model form for student that contains his topic chosen for project, languages used and duration with a model called project.	Week9
10	For students enrolment developed in Module 2, create a generic class view which displays list of students and detailview that displays student details for any selected student in the list.	Week10
11	Develop example Django app that performs CSV and PDF generation for any models created in previous laboratory component.	Week11

12	Develop a registration page for student enrolment as done in Module 2 but without page refresh using AJAX.	Week12
13	Develop a search application in Django using AJAX that displays courses enrolled by a student being searched.	Week13

LABORATORY

General Lab Guidelines:

1. Conduct yourself in a responsible manner at all times in the laboratory. Intentional misconduct will lead to exclusion from the lab.
2. Do not wander around, or distract other students, or interfere with the laboratory experiments of other students.
3. Read the handout and procedures before starting the experiments. Follow all written and verbal instructions carefully.
4. If you do not understand the procedures, ask the instructor or teaching assistant. Attendance in all the labs is mandatory, absence permitted only with prior permission from the Class teacher.
5. The workplace has to be tidy before, during and after the experiment.
6. Do not eat food, drink beverages or chew gum in the laboratory.
7. Every student should know the location and operating procedures of all Safety equipment including First Aid Kit and Fire extinguisher.

DO'S:-

1. An ID card is a must.
2. Keep your belongings in a designated area.
3. Sign the log book when you enter/leave the laboratory.
4. Records have to be submitted every week for evaluation.
5. The program to be executed in the respective lab session has to be written in the lab observation copy beforehand.
6. After the lab session, shut down the computers.
7. Report any problem in system (if any) to the person in-charge

DON'TS:-

1. Do not insert metal objects such as clips, pins and needles into the computer casings(They may cause fire) and should not attempt to repair, open, tamper or interfere with any of the computer, printing, cabling, or other equipment in the laboratory.
2. Do not change the system settings and keyboard keys.
3. Do not upload, delete or alter any software/ system files on laboratory computers.
4. No additional material should be carried by the students during regular labs.

5. Do not open any irrelevant websites in labs.
6. Do not use a flash drive on lab computers without the consent of the lab instructor.
7. Students are not allowed to work in the Laboratory alone or without the presence of the instructor/teaching assistant.

FULL STACK DEVELOPMENT

- Full Stack Development refers to the practice of developing both the front-end (client-side) and back-end (server-side) portions of web applications.
- A full stack developer is proficient in working with both the front-end and back-end technologies, allowing them to build complete web applications independently or as part of a team.

Technologies used in full stack development

Front-End Technologies:

- HTML (Hypertext Markup Language): Used for structuring web pages.
- CSS (Cascading Style Sheets): Used for styling the appearance of web pages.
- JavaScript: A programming language used for adding interactivity and dynamic behavior to web pages.
- Front-end frameworks/libraries such as React.js, AngularJS, or Vue.js: These provide tools and utilities for building user interfaces and managing application state.

Back-End Technologies:

- Server-side languages like JavaScript (Node.js), Python (Django, Flask), Ruby (Ruby on Rails), Java (Spring Boot), or PHP (Laravel), C#(.Net Framework), java(Servlets)
- Databases such as MySQL, PostgreSQL, MongoDB, or Firebase for storing and managing data.
- Web servers like Apache or Nginx or IIS or Tomcat or Caddy(with built in support for https) for handling HTTP requests.

Development Tools and Environment:

- Version control systems like Git for managing code changes.
- Integrated Development Environments (IDEs) such as Visual Studio Code, Sublime Text, or Atom.

- Command-line tools for tasks like package management (npm for Node.js, pip for Python, nugget for .Net), running servers, and deployment.

Important STACKS

- MEAN Stack
- MERN Stack
- Django Stack
- LAMP
- WAMP

Why Django?

- Rapid Development:- DRY (Don't repeat Yourself)
- Saves Time and Money
- Rounded Solution
- Great Exposure
- Complete Ownership
- Greater opportunity with more learning
- Security (Prevention of threats such as SQL injection, cross-site scripting (XSS), cross-site request forgery (CSRF), and clickjacking by providing {% csrf_token %} django tag to be included inside the form.

  This token generates a hidden input field containing a unique CSRF token. This token is then validated by Django when the form is submitted, ensuring that the request originated from the same site and protecting against CSRF attacks.

- Batteries Included Philosophy (Model Forms)

- Built in database (Sqlite DB)

What is Django

- Django is a free and open source web application framework which offers fast and effective dynamic website development.
- It is written using python.
- It follows MVT (model, view and template architecture)

Framework

A framework is a pre-built collection of libraries, modules, and tools that provides a structured approach to developing software applications.

- Django is a web development framework.
- AngularJS is a Web Frontend development framework
- React is a Web frontend development library.

Django Evolution

1. Write a Web application from scratch.

2. Write another Web application from scratch.

3. Realize the application from step 1 shares much in common with the application from step 2.

4. Refactor the code so that application 1 shares code with application 2.

5. Repeat steps 2–4 several times.

6. Realize you've invented a framework

Django MVT

The MVT is a software design pattern which includes three important components Model, View and Template.

- The **Mode**l helps to handle database. It is a data access layer which handles the data.
- The **Template** is a presentation layer which handles User Interface part completely.
- The **View** is used to execute the business logic and interact with a model to carry data and renders a template.

Characteristics of Django

- Loosely Coupled − Django helps you to make each element of its stack independent of the others.
- Less code - Ensures effective development
- Not repeated- Everything should be developed in precisely one place instead of repeating it again
- Fast development- Django's offers fast and reliable application development.
- Consistent design - Django maintains a clean design and makes it easy to follow the best web development practices.

Python Virtual Environment

- A Python Virtual Environment is an isolated space where you can work on your Python projects, separately from your system-installed Python.
- You can set up your own libraries and dependencies without affecting the system Python.
- There are no limits to the number of virtual environments
- It allows you to have multiple Python environments with different versions of Python and different sets of installed packages on the same system.
- It is generally good to have one new virtual environment for every Python-based project you work on
- You can change the system python version, django version and other dependencies without affecting the project python version, django versions and dependencies

Installation of Python and Visual Studio code editors can be demonstrated.

- Python download Link:

  https://www.python.org/downloads/

- Visual Studio Code download and installation link:

https://code.visualstudio.com/

Creating system root folder, project root project folder, creating virtual env inside project root folder.

Create a system root folder with the name **BIT_CSE_FDP** in the file system (inside any preferred drive).

- Create a project root folder inside **BIT_CSE_FDP** with the name "**hello_world**" (assuming we are doing simple hello world program)
- Open **cmd** inside "**hello_world**"
- Create virtual env inside "**hello_world**" with the name "**hello_world_venv**"

  pyton –m venv <name_of_virtual_env>

  python –m venv hello_world_venv

Open project root folder in VS code

- Run "code ." in the cmd prompt to launch the project folder "hello_world" in VS code.

  or

- Launch VS code from the task bar, goto file menu navigate and open "hello_world"

Command palette (select your venv as python interpreter for your project root folder)

- In VS Code, open the Command Palette (**View** > **Command Palette** or (Ctrl+Shift+P)). Then select the **Python: Select Interpreter** command
- The command presents a list of available interpreters that VS Code can locate automatically. From the list, select the virtual environment in your project folder that starts with ./env or .\env:
- Select the virtual environment that is created “hello_world_venv”. Look for recommended
- Open VS code terminal and install django framework.

```
pip install django
```

- Check whether django installation is correct

```
python manage.py runserver
```

- Create the django project with the name “hello_world_proj” inside the project root folder “hello_world”

```
django-admin  startproject proj .
```

- Create the django app with the name “hello_world_app”

```
python manage.py startapp hello_world_app
```

SAMPLE PROGRAMS

Helloworld

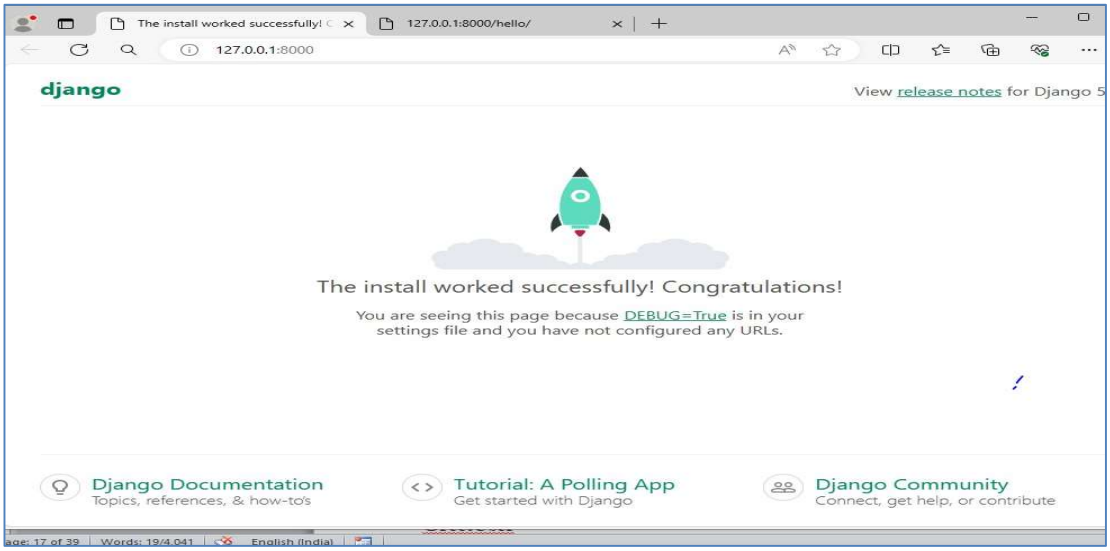
views.py

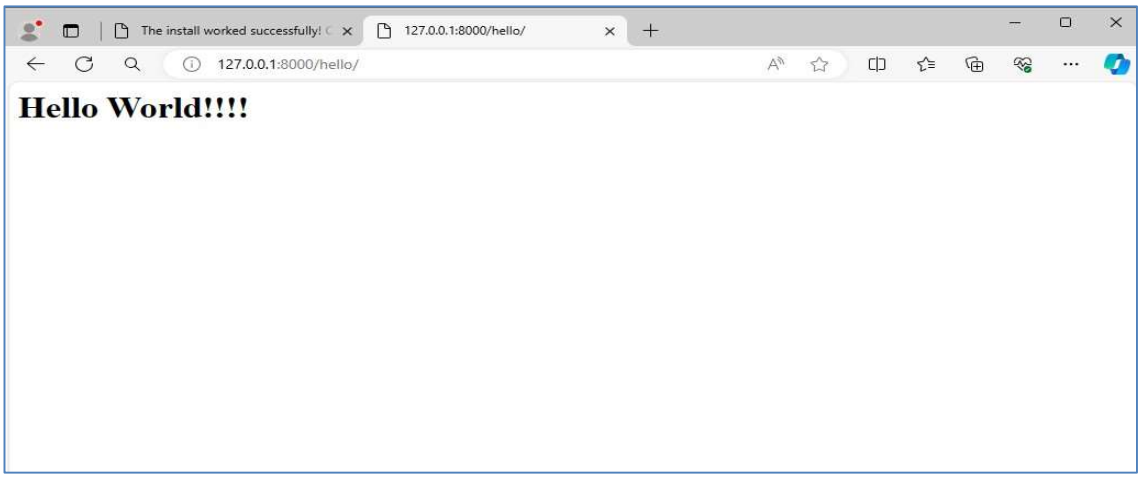
```
from django.http import HttpResponse
from django.shortcuts import render

# Create your views here.

def hello(request):
    resp="<h1>Hello World!!!!</h1>"
    return HttpResponse(resp)
```

urls.py

```
from django.contrib import admin
from django.urls import path

from hello_world_app.views import hello

urlpatterns = [
    path('admin/', admin.site.urls),
    path('hello/',hello),
]
```

OUTPUT


The install worked successfully!
127.0.0.1:8000/hello/
127.0.0.1:8000
django
View release notes for Django 5
The install worked successfully! Congratulations!
You are seeing this page because DEBUG=True is in your settings file and you have not configured any URLs.
Django Documentation
Topics, references, & how-to's
Tutorial: A Polling App
Get started with Django
Django Community
Connect, get help, or contribute


The install worked successfully!
127.0.0.1:8000/hello/
127.0.0.1:8000/hello/
Hello World!!!!

GreetUser

greet.html

```
<!DOCTYPE html>
<html>
   <head>
      <title>Greet App</title>

   </head>

   <body>
      <h1>{{user}} Good afternoon! Welcome to FDP on Full stack development</h1>
   </body>
</html>
```

views.py

```
from django.shortcuts import render

# Create your views here.

def greet(request,user):
   uname=user
   d={'user':user}
   return render(request,'greet.html',d)
```

urls.py

```
from django.contrib import admin
from django.urls import path

from greetUserApp.views import greet

urlpatterns = [
   path('admin/', admin.site.urls),
   path('greet/<str:user>/',greet),
```

]

OUTPUT


127.0.0.1:8000/greet/vidya/
Paused
Gmail
YouTube
Maps
vidya Good afternoon! Welcome to FDP on Full stack development

Vowel Count

StudentlistApp

views.py

```
from django.http import HttpResponse
from django.shortcuts import render

# Create your views here.
def studentList(request,studentList):  # rama,krishna,harish,chetan
    studList=studentList.split(',')       # [rama, krishna, harish, chetan]
    resp="<h1>Student List in Alphabetical order</h1>"
    #resp+="<h2>"+str(sorted(studList))+"</h2>"
    for s in sorted(studList):
        resp+="<li>"+s+"</li>"
    resp+="<h1>Student List in reverse order</h1>"
    #resp+="<h2>"+str(sorted(studList,reverse=True))+"</h2>"
    for s in sorted(studList,reverse=True):
        resp+="<li>"+s+"</li>"
    resp+="<h1>Student List in order of their name length</h1>"
    #resp+="<h2>"+str(sorted(studList,key=len))+"</h2>"
    for s in sorted(studList,key=len):
        resp+="<li>"+s+"</li>"
    return HttpResponse(resp)
```

views.py

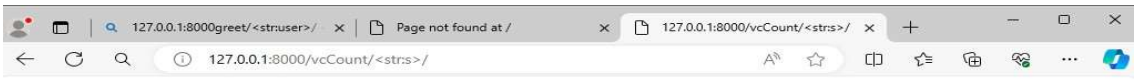
```
from django.http import HttpResponse
from django.shortcuts import render

# Create your views here.

def VC(request,s):
    v_cnt=0
    c_cnt=0
    v_dict={} #v_dict=dict()
```

```
    c_dict={}

    for letter in s:
        if letter.isalpha():
            if letter in "aeiouAEIOU":
                v_cnt=v_cnt+1
                v_dict[letter]=v_dict.get(letter,0)+1
            else:
                c_cnt=c_cnt+1
                c_dict[letter]=c_dict.get(letter,0)+1
    resp="<h1>Vowel Count=%d</h1><h1>Cons Count=%d</h1>"%(v_cnt,c_cnt)
    resp+="<h1>Vowel Count Frequency</h1>"
    for key,val in v_dict.items():
        resp+="<h3>"+key+":"+str(val)+"</h3>"
    resp+="<h1>Cons Count Frequency</h1>"
    for key,val in c_dict.items():
        resp+="<h3>"+key+":"+str(val)+"</h3>"
    return HttpResponse(resp)
```

urls.py

```
from django.contrib import admin
from django.urls import path

from vcCountApp.views import VC
from studentListApp.views import studentList
urlpatterns = [
    path('admin/', admin.site.urls),
    path('vcCount/<str:s>/',VC),
    path('studlist/<str:studentList>/',studentList),
]
```

OUTPUT



Vowel Count=0

Cons Count=4

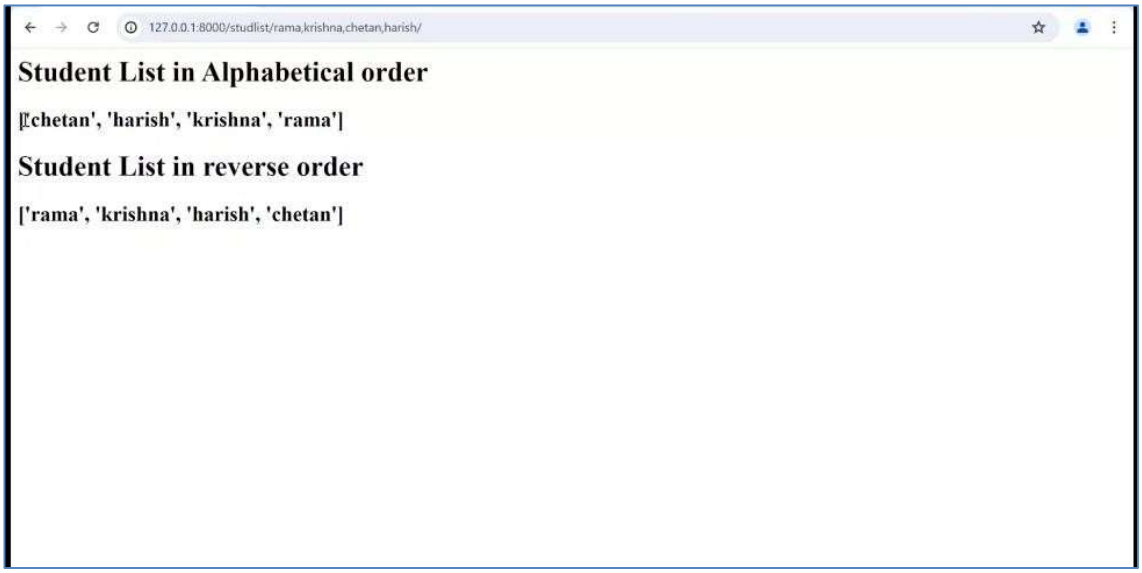
Vowel Count Frequency

Cons Count Frequency

s:2

t:1

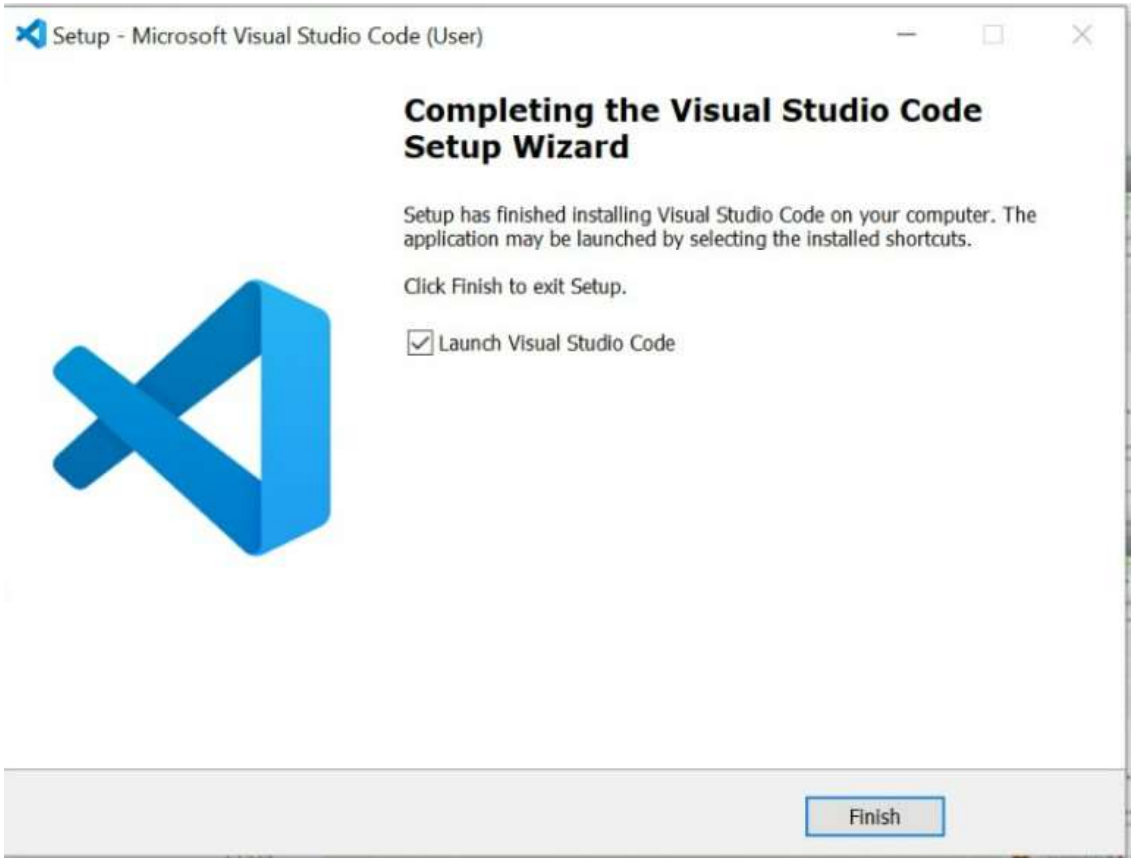
r:1

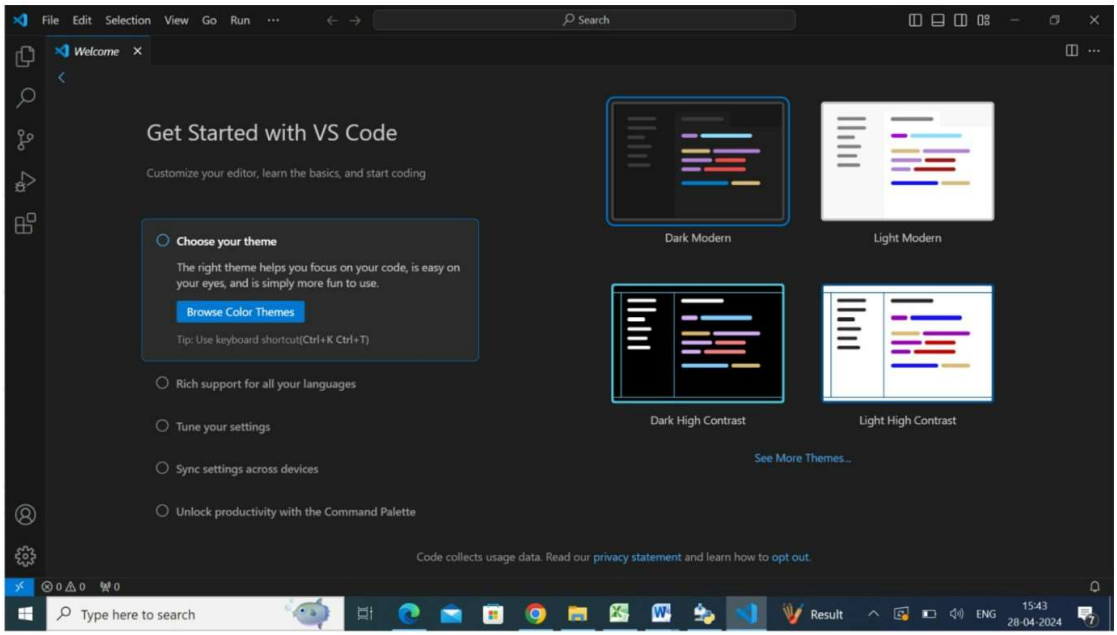


LAB PROGRAMS

PROGRAM 1

1.1 Installation of Python, Django and Visual Studio code editors can be demonstrated.


Setup - Microsoft Visual Studio Code (User)
Completing the Visual Studio Code Setup Wizard
Setup has finished installing Visual Studio Code on your computer. The application may be launched by selecting the installed shortcuts.
Click Finish to exit Setup.
Launch Visual Studio Code
Finish


File Edit Selection View Go Run
Search
Welcome
Get Started with VS Code
Customize your editor, learn the basics, and start coding
Choose your theme
The right theme helps you focus on your code, is easy on your eyes, and is simply more fun to use.
Browse Color Themes
Tip: Use keyboard shortcut(Ctrl+K Ctrl+T)
Rich support for all your languages
Tune your settings
Sync settings across devices
Unlock productivity with the Command Palette
Dark Modern
Light Modern
Dark High Contrast
Light High Contrast
See More Themes...
Code collects usage data. Read our privacy statement and learn how to opt out.
Type here to search
Result
ENG
15:43
28-04-2024

1.2 Develop a Django app that displays current date and time in server

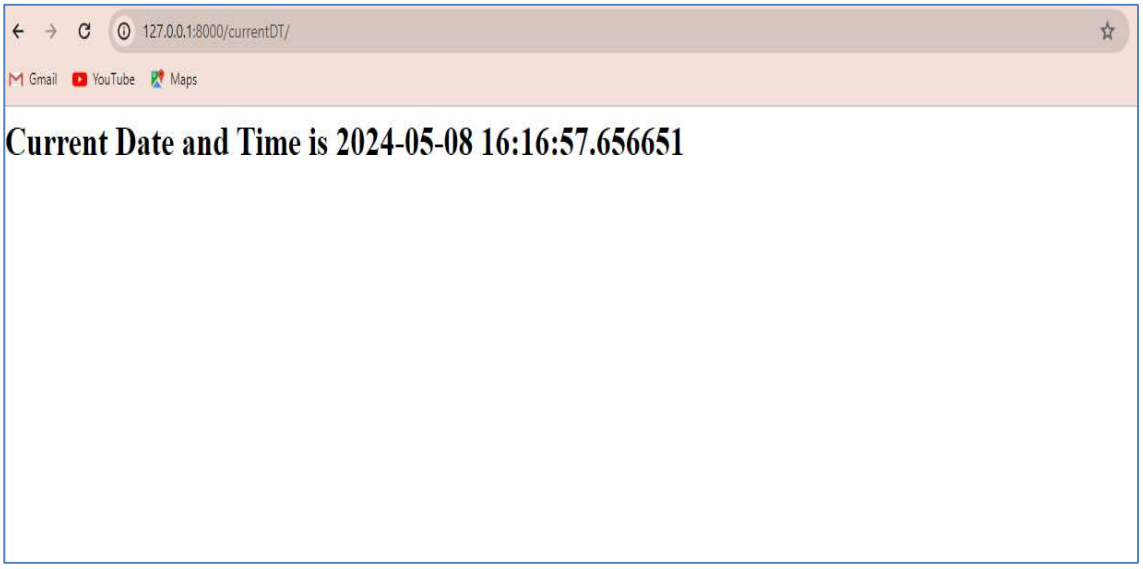
views.py

```
from django.shortcuts import render
import datetime
from django.http import HttpResponse
# Create your views here.
def cdt(request):
    dt=datetime.datetime.now()
    resp="<h1>Current Date and Time is %s<h1>"%(dt)
    return HttpResponse(resp)
```

urls.py

```
from django.contrib import admin
from django.urls import path
from scdtApp.views import cdt
urlpatterns = [
    path('admin/', admin.site.urls),
    path('currentDT/',cdt),
]
```

OUTPUT


127.0.0.1:8000/currentDT/
Gmail
YouTube
Maps
Current Date and Time is 2024-05-08 16:16:57.656651

1.3 Develop a Django app that displays date and time four hours ahead and four hours before as an offset of current date and time in server.

Displays Date & Time Four hours Ahead.

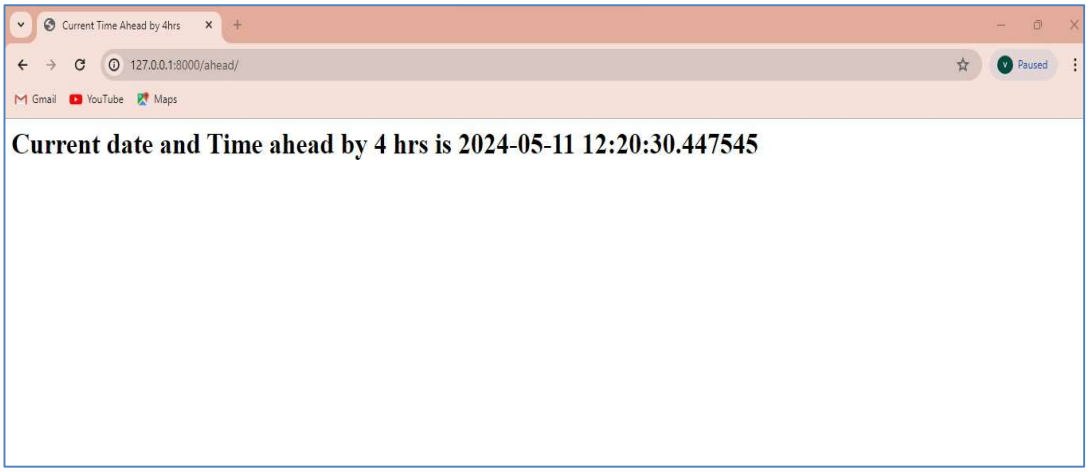
views.py

```
from django.shortcuts import render
import datetime
from django.http import HttpResponse
# Create your views here.

def aheadtime(request):
    dt=datetime.datetime.now()+datetime.timedelta(hours=4)
    resp="<html><head><title>Current Time Ahead by
4hrs</title></head><body><h1>Current date and Time ahead by 4 hrs is %s
</h1></body></html>"%(dt)
    return HttpResponse(resp)
```

urls.py

```
from django.contrib import admin
from django.urls import path
from scdt_a4App.views import aheadtime
urlpatterns = [
    path('admin/', admin.site.urls),
    path('ahead/',aheadtime),
]
```

OUTPUT



Displays Date & Time Four hours Before.

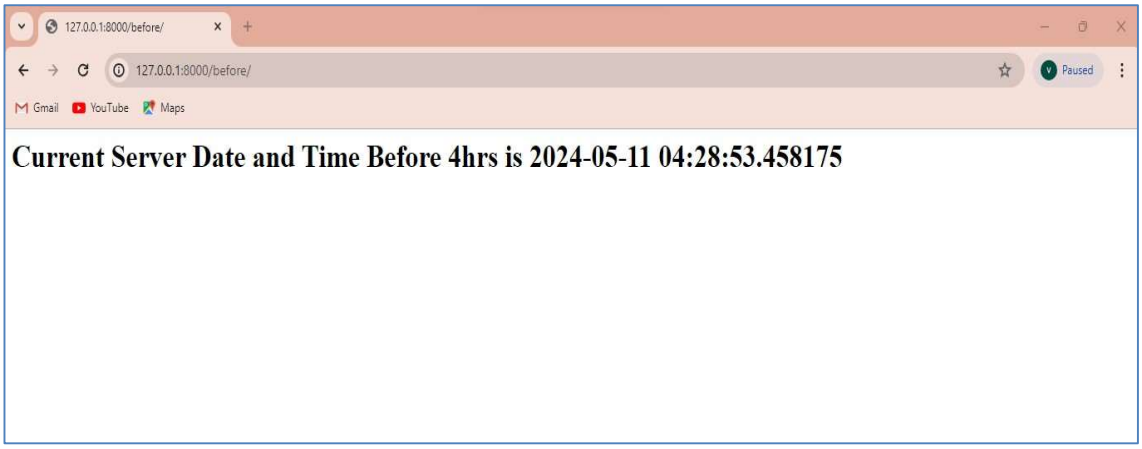
views.py

```
from django.shortcuts import render
import datetime
from django.http import HttpResponse
# Create your views here.
def beforetime(request):
    dt=datetime.datetime.now()+datetime.timedelta(hours=-4)
    resp="<h1>Current Server Date and Time Before 4hrs is %s</h1>"%(dt)
    return HttpResponse(resp)
```

urls.py

```
from django.contrib import admin
from django.urls import path
from scdt_b4App.views import beforetime
urlpatterns = [
    path('admin/', admin.site.urls),
    path('before/',beforetime),
]
```

OUTPUT



Displays Date & Time Five hours Ahead & Before.

views.py

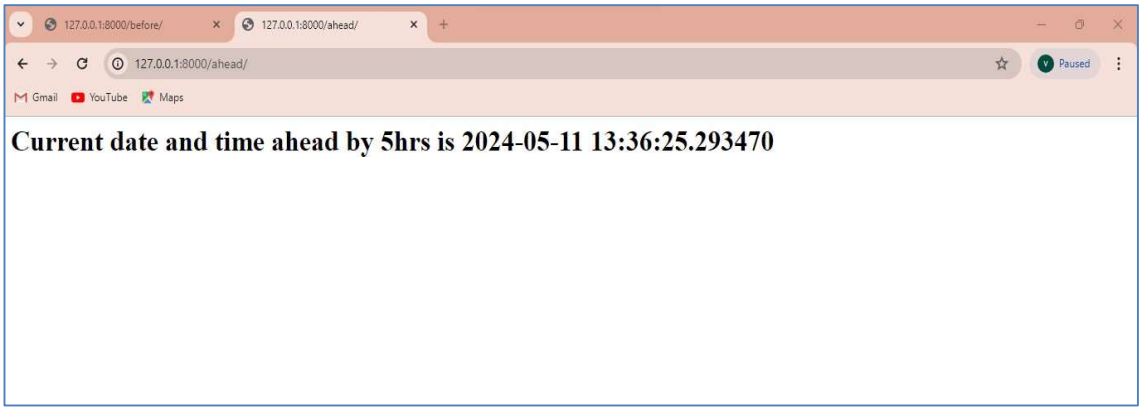
```
from django.shortcuts import render
import datetime
from django.http import HttpResponse
# Create your views here.
def ahead(request):
    dt=datetime.datetime.now()+datetime.timedelta(hours=5)
    resp="<h1>Current date and time ahead by 5hrs is %s</h1>"%(dt)
    return HttpResponse(resp)

def before(request):
    dt=datetime.datetime.now()+datetime.timedelta(hours=-5)
    resp="<h1>Current date and time before by 5hrs is %s</h1>"%(dt)
    return HttpResponse(resp)
```

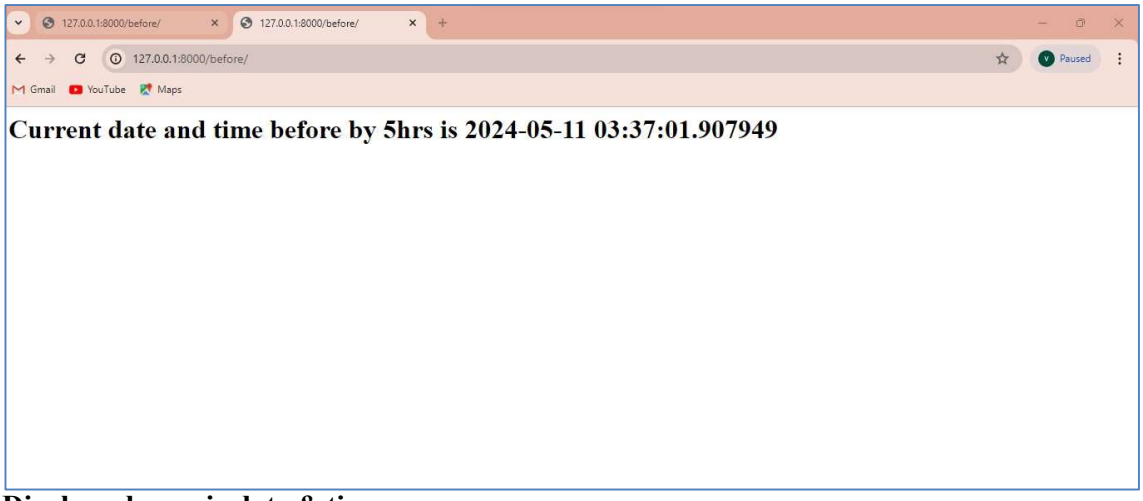
urls.py

```
from django.contrib import admin
from django.urls import path
from scdt_abApp.views import ahead, before
```

```
urlpatterns = [
    path('admin/', admin.site.urls),
    path('ahead/',ahead),
    path('before/',before),
]
```

OUTPUT





Displays dynamic date & time.

views.py

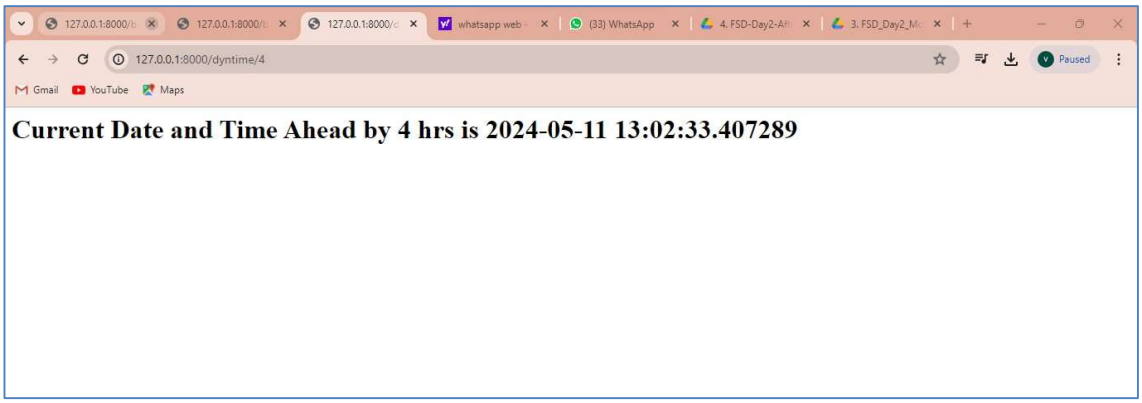
```
from django.shortcuts import render
import datetime
from django.http import HttpResponse
```

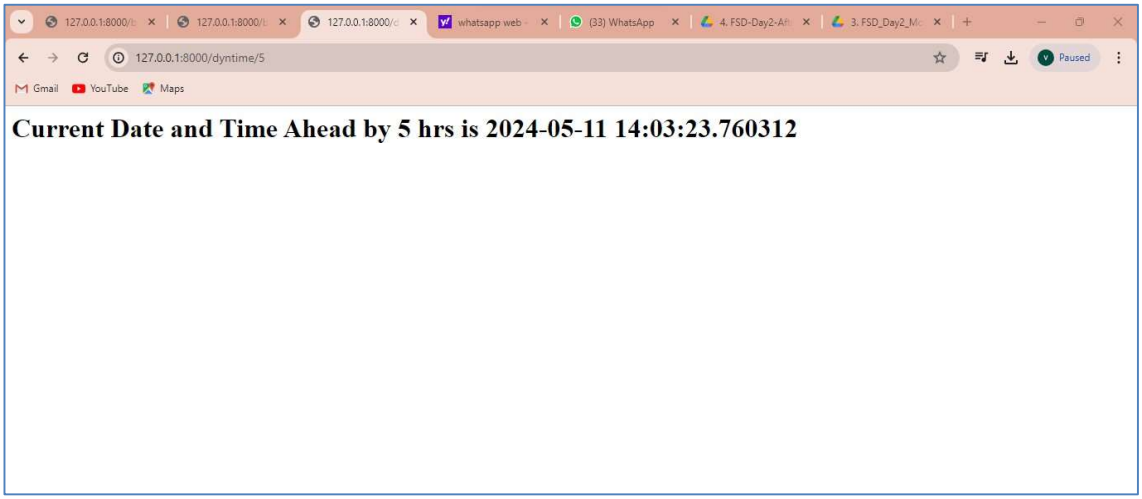
```
# Create your views here.

def scdt_dyn(request,t):
    dt=datetime.datetime.now()+datetime.timedelta(hours=t)
    resp="<h1>Current Date and Time Ahead by %d hrs is %s</h1>"%(t,dt)
    return HttpResponse(resp)
```

urls.py

```
from django.contrib import admin
from django.urls import path
from scdt_dynApp.views import scdt_dyn
urlpatterns = [
    path('admin/', admin.site.urls),
    path('dyntime/<int:t>',scdt_dyn),
]
```

OUTPUT





Displays dynamic date & time. (All Conditions)

views.py

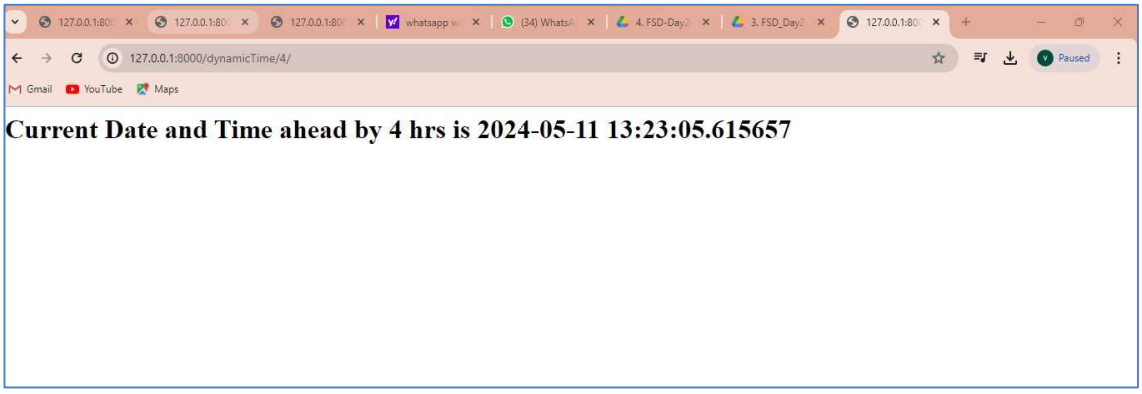
```
import datetime
from django.http import HttpResponse
from django.shortcuts import render

# Create your views here.

def scdt(request,s):
    t=int(s)
    dt=datetime.datetime.now()+datetime.timedelta(hours=t)
    if t<0:
        resp="<h1>Current Date and Time Behind %d hrs is %s</h1>"%(t,dt)
    elif t>0:
        resp="<h1>Current Date and Time ahead by %d hrs is %s</h1>"%(t,dt)
    else:
        resp="<h1>There is no change in current date and time</h1>"
    return HttpResponse(resp)
```

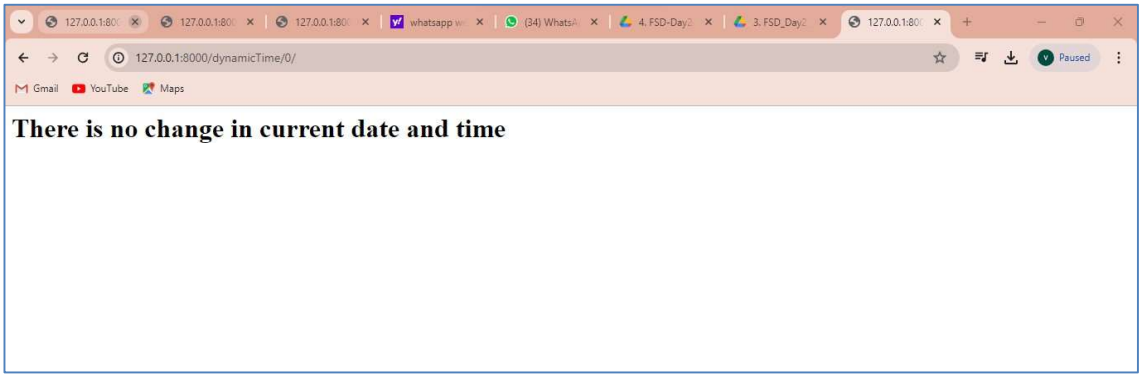
urls.py

```
from django.contrib import admin
from django.urls import path

from scdt_dynamicApp.views import scdt
```

```
urlpatterns = [
    path('admin/', admin.site.urls),
    path('dynamicTime/<str:s>/',scdt),
]
```

OUTPUT




127.0.0.1:8000/dynamicTime/0/
Gmail
YouTube
Maps
Paused
There is no change in current date and time

PROGRAM 2

2.1 Develop a simple Django app that displays an unordered list of fruits and ordered list of selected students for an event.

fruits_student.html

```
<!DOCTYPE html>
<html>
  <head>
    <style>
      #a1{background-color: lightblue;color:brown}
      #a2{background-color:blue;color:yellow}
    </style>
    <title>
      Unordered Fruits and Ordered Students
    </title>
  </head>
  <body>
    <h1 id="a1">Unordered List of Fruits</h1>
    <ul>
      {% for fruit in fruitList %}
      <li>{{fruit}}</li>
      {% endfor %}
    </ul>
    <h1 id="a2">Ordered List of Students Selected for an Event</h1>
    <ol>
      {% for student in studentList %}
      <li>{{student}}</li>
      {% endfor %}
    </ol>
  </body>
</html>
```

views.py

```
from django.shortcuts import render
```

```
# Create your views here.

def fruit_student(request):
    fruitList=['Mango','Kiwi','Banana','Apple','Grapes']
    studentList=['Rama','Chetan','Kumar','Harish','Geetha']
    return
render(request,'fruit_student.html',{'fruitList':fruitList,'studentList':sorted(studentList)})
```

urls.py

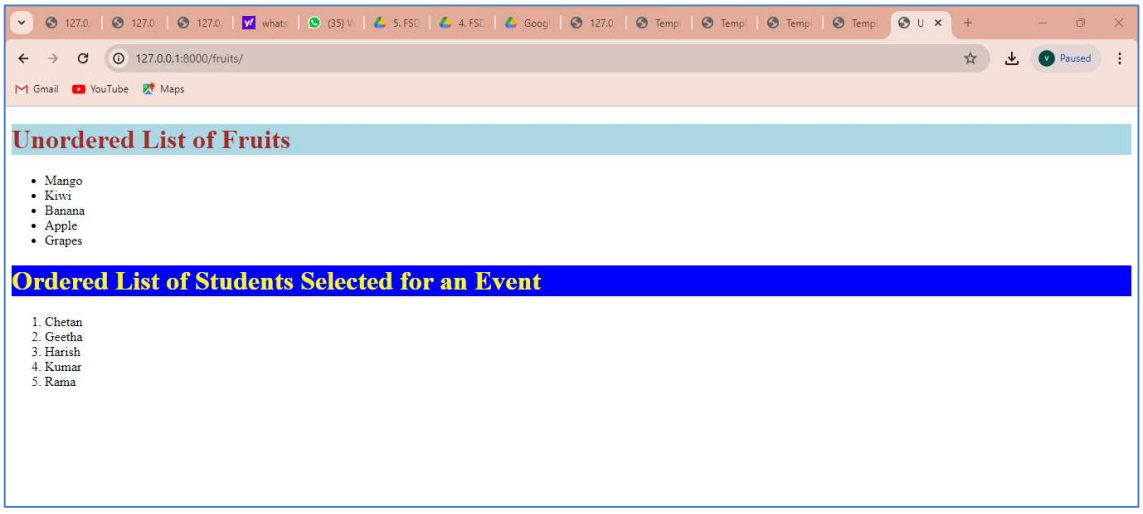
```
from django.contrib import admin
from django.urls import path
from FruitsApp.views import fruit_student
urlpatterns = [
    path('admin/', admin.site.urls),
    path('fruits/',fruit_student),
]
```

settings.py (only one change inside installed apps add fruitsapp)

```
from pathlib import Path

# Build paths inside the project like this: BASE_DIR / 'subdir'.
BASE_DIR = Path(__file__).resolve().parent.parent


# Quick-start development settings - unsuitable for production
# See https://docs.djangoproject.com/en/5.0/howto/deployment/checklist/

# SECURITY WARNING: keep the secret key used in production secret!
SECRET_KEY = 'django-insecure-ox%@6r-
9t3%m$c&8yr(ox$2ktr!dwtl!rwr$g$*tyb6=z=9w+$'
```

```
# SECURITY WARNING: don't run with debug turned on in production!
DEBUG = True

ALLOWED_HOSTS = []


# Application definition

INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'fruitsapp',
]
```

OUTPUT



2.2 . Develop a layout.html with a suitable header (containing navigation menu) and footer with copyright and developer information. Inherit this layout.html and create 3 additional pages: contact us, About Us and Home page of any website.

layout.html

```
<!DOCTYPE html>
<html>
   <head>
      <style>
         nav{background-color: lightblue;padding: 15px;}
      </style>
   <title>
      {% block title %} {% endblock %}
   </title>
</head>
   <body>
      <nav>
         <a href="/home/">HOME</a>
         <a href="/contactus/">CONTACT US</a>
         <a href="/aboutus/">ABOUT US</a>

      </nav>
      <section>
         {% block content %} {% endblock %}
      </section>
      <footer>
         <hr>
         &copy; Designed and Developed by Dr. Harish Kumar B T, CSE, BIT, Bangalore-04
      </footer>
   </body>
</html>
```

home.html

```
{% extends 'layout.html' %}
{% block title %} HOME Page {% endblock %}
{% block content %}
<h1>This is my home page</h1>
{% endblock %}
```

about.html

```
{% extends 'layout.html' %}
{% block title %} ABOUT PAGE {% endblock %}
{% block content %}
<h1>About Us</h1>
<p>Dr. Harish Kumar  B T, Asso. Prof, Dept of CSE, BIT</p>

{% endblock %}
```

contactus.html

```
{% extends 'layout.html' %}
{% block title %} Contact us {% endblock %}
{% block content %}
<h1>Contact us</h1>
<p>Name: Dr. Harish Kumar  B T</p>
<p>Designation:Asso. Prof </p>
<p>Mobile: 9980119894</p>
<p>Email: harish.bitcse82@gmail.com</p>
{% endblock %}
```

views.py

```
from django.shortcuts import render

# Create your views here.

def home(request):
    return render(request,'home.html')
```

```
def contactus(request):
    return render(request,'contactus.html')
def aboutus(request):
    return render(request,'about.html')
```

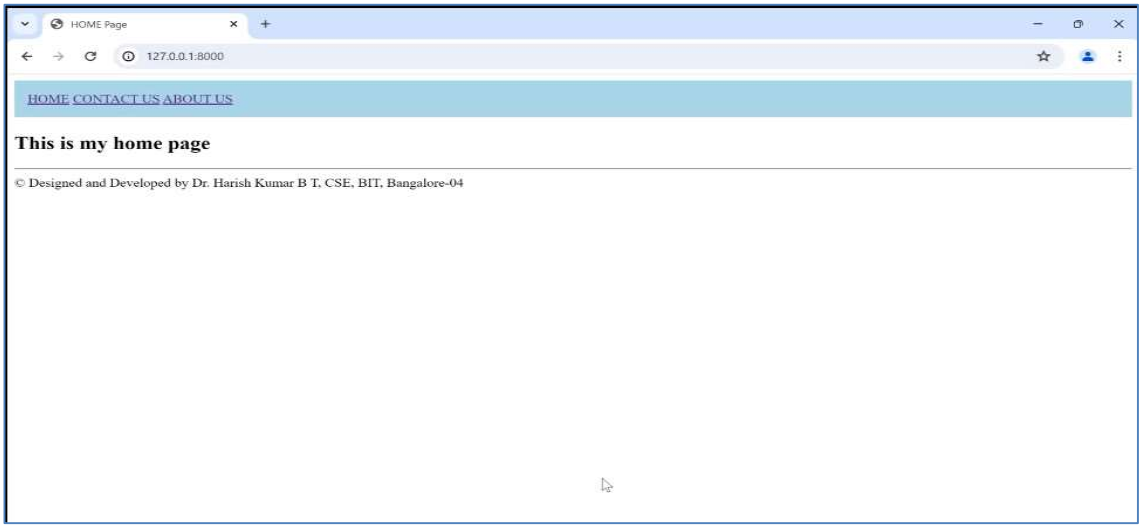
urls.py

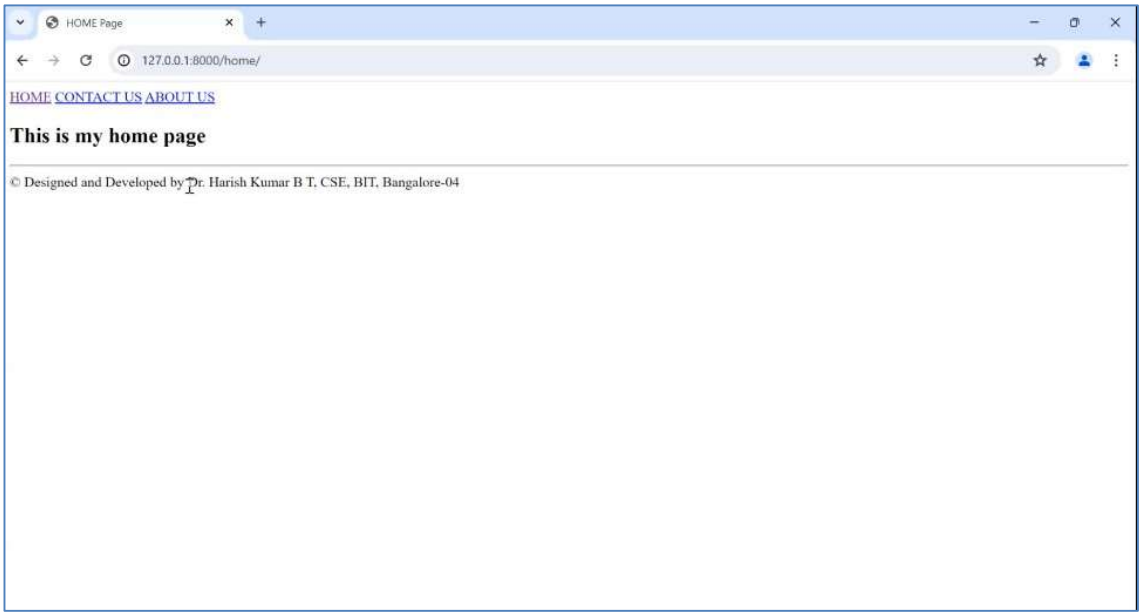
```
from django.contrib import admin
from django.urls import path

from layoutApp.views import aboutus, contactus, home

urlpatterns = [
    path('admin/', admin.site.urls),
    path('',home),
    path('contactus/',contactus),
    path('aboutus/',aboutus),
    path('home/',home),
]
```

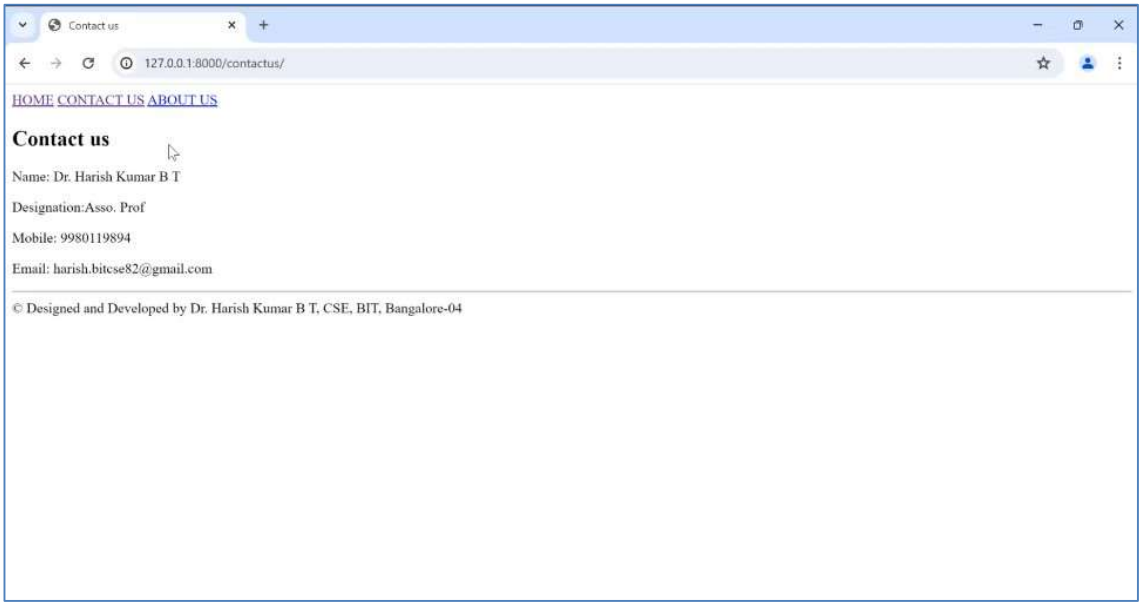
settings.py (only one change inside installed apps add layoutapp)

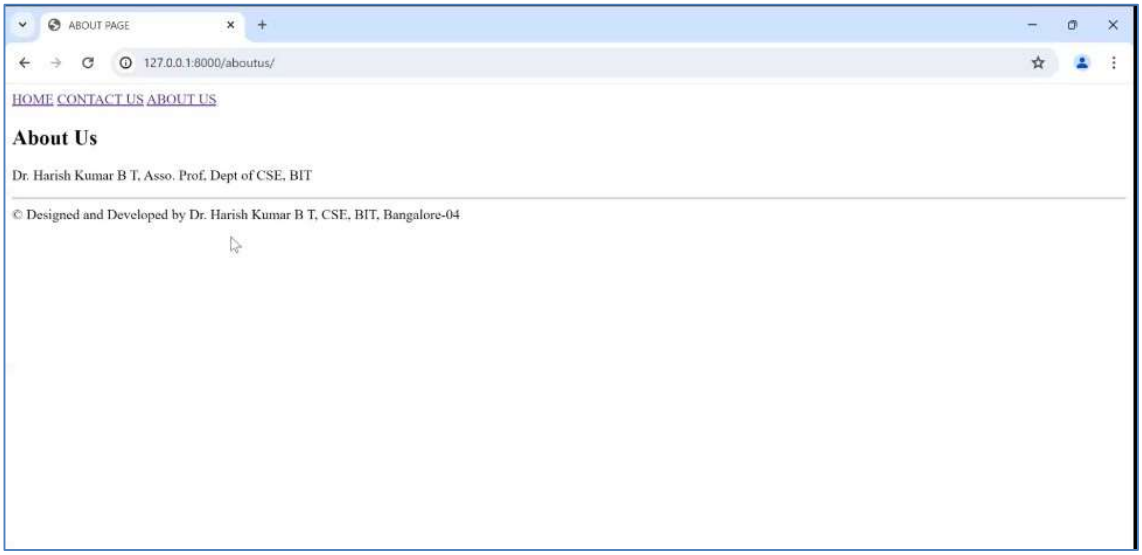
```
# Application definition

INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'layoutApp',
]
```

OUTPUT


HOME Page
127.0.0.1:8000
HOME CONTACT US ABOUT US
This is my home page
© Designed and Developed by Dr. Harish Kumar B T, CSE, BIT, Bangalore-04


HOME Page
127.0.0.1:8000/home/
HOME CONTACT US ABOUT US
This is my home page
© Designed and Developed by Dr. Harish Kumar B T, CSE, BIT, Bangalore-04


Contact us
127.0.0.1:8000/contactus/
HOME CONTACT US ABOUT US
Contact us
Name: Dr. Harish Kumar B T
Designation:Asso. Prof
Mobile: 9980119894
Email: harish.bitcse82@gmail.com
© Designed and Developed by Dr. Harish Kumar B T, CSE, BIT, Bangalore-04


ABOUT PAGE
127.0.0.1:8000/aboutus/
HOME CONTACT US ABOUT US
About Us
Dr. Harish Kumar B T, Asso. Prof, Dept of CSE, BIT
© Designed and Developed by Dr. Harish Kumar B T, CSE, BIT, Bangalore-04

2.3. Develop a Django app that performs student registration to a course. It should also display list of students registered for any selected course. Create students and course as models with enrolment as ManyToMany field.

basicTemplate.html

```
<!DOCTYPE html>
<html>
   <head>
      <style>
         nav{background-color: lightblue;padding: 15px;  }
         nav a {
   color: #fff; /* Text color */
   text-decoration: none; /* Remove underline */
   padding: 10px 20px; /* Padding around each link */
   margin: 0px 10px; /* Spacing between links */
   border-radius: 5px; /* Rounded corners */
   background-color: #555;
   flex-wrap: wrap;

}

nav a:hover {
   background-color:aqua;/* Background color on hover */
}
ul {
         list-style: none;
         margin: 0;
         padding: 0;
         display: flex; /* Use flexbox */
         flex-wrap: wrap; /* Allow items to wrap to the next line */
         flex-direction: row; /* Display items in a column */
      }
      li {
         margin-right: 20px;
```

```
        margin-bottom: 25px;
      }

    </style>
    <title>
      {% block title %} {% endblock %}
    </title>
  </head>

  <body>
    <center> <h1 style="background-color: blue;color:yellow"> STUDENT COURSE
REGISTRATION PORTAL</h1></center>
    <nav>
                <ul>
      <li>  <a href="/home/">HOME</a></li>
       <li> <a href="/studentlist/">STUDENT LIST</a></li>
      <li>  <a href="/courselist/">COURSE LIST</a> </li>
       <li> <a href="/register/">REGISTER</a></li>
      <li>  <a href="/enrolledlist/">ENROLLED LIST</a></li>
       <li> <a href="/addproject/">ADD PROJECT</a></li>
        <li><a href="/genericlistviewstudent/">GENERIC STUDENT LIST VIEW</a></li>
       <li> <a href="/download_course_table_as_csv/">DOWNLOAD COURSE AS
CSV</a> </li>
       <li> <a href="/download_course_table_as_pdf/">DWONLOAD COURSE AS
PDF</a></li>
</ul>
    </nav>
    <section>
     {% block content %} {% endblock %}
  </section>
  <footer>
     <hr/>
    <center>
```

```
        &copy; Designed and Developeb by Dr. Harish Kumar B T, Dept. of CSE, BIT,
Bangalore-04
      </center>
   </footer>

   </body>
</html>
```

home.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Home Page {% endblock %}

{% block content %}

<li>Click on Student List to get the List of students</li>
<li> Click on Course List to get the list of courses</li>
<li>click on register to enroll student to a course</li>

{% endblock %}
```

studentlist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Student List {% endblock %}
{% block content%}
<h1>Student List</h1>
<table border="1">
   <tr>
      <th>
         USN
      </th>
      <th>
         NAME
      </th>
      <th>
```

```
        SEM
      </th>
    </tr>

    {% for s in student_list %}
    <tr>
      <td>{{s.usn}}</td>
      <td>{{s.name}}</td>
      <td>{{s.sem}}</td>
    </tr>
    {% endfor %}

</table>
{% endblock %}
```

courselist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course List {% endblock %}



{% block content%}
<h1> Course List</h1>
<table border="1">
    <tr>
      <th>
        Sub Code
      </th>
      <th>
        Sub Name
      </th>
      <th>
        Credits
      </th>
```

```
    </tr>

    {% for c in course_list %}
    <tr>
        <td>{{c.courseCode}}</td>
        <td>{{c.courseName}}</td>
        <td>{{c.courseCredits}}</td>
    </tr>
    {% endfor %}

</table>

{% endblock %}
```

enrolledlist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course Registration Details {% endblock %}

{% block content %}


<form method="POST" action="">
    {% csrf_token %}
    Select Course:
    <select name="course">
        {% for c in Course_List %}
        <option value="{{c.id}}">{{c.courseCode}}</option>
        {% endfor %}
    </select>
    <input type="submit" value="Search"/>
    {% if student_list %}
    <h1> List of Students registered of the course {{course.courseCode}}</h1>
<table border="1">
```

```
    <tr>
      <th>
        USN
      </th>
      <th>
        NAME
      </th>
      <th>
        SEM
      </th>
    </tr>

    {% for s in student_list %}
    <tr>
      <td>{{s.usn}}</td>
      <td>{{s.name}}</td>
      <td>{{s.sem}}</td>
    </tr>
    {% endfor %}
</table>
{% endif %}
</form>

{% endblock %}
```

register.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course Register Page {% endblock %}

{% block content %}
<h1> Student Course Registration</h1>
<form method="POST" action="">
  {% csrf_token %}
  Select USN:
```

```
 <select name="student">
   {% for s in student_list %}
   <option value="{{s.id}}">{{s.usn}}</option>
   {% endfor %}
 </select>

 Select Course:
 <select name="course">
   {% for c in course_list %}
   <option value="{{c.id}}">{{c.courseCode}}</option>
   {% endfor %}
 </select>
 <input type="submit" value="ENROLL"/>
</form>
{% endblock %}
```

models.py

```
from django.db import models
from django.forms import ModelForm

# Create your models here.

class course(models.Model):
    courseCode=models.CharField(max_length=10)
    courseName=models.CharField(max_length=50)
    courseCredits=models.IntegerField()

    def __str__(self):
        return self.courseCode+" "+self.courseName+" "+str(self.courseCredits)


class student(models.Model):
    usn=models.CharField(max_length=10)
    name=models.CharField(max_length=40)
```

```
    sem=models.IntegerField()
    courses=models.ManyToManyField(course,related_name='student_set')
    def __str__(self):
        return self.usn+" "+self.name+" "+str(self.sem)
```

After writing models.py run the below commands in VS code terminal.

python manage.py makemigrations

python manage.py migrate

Open python interactive console in VS code terminal by giving the following command
python manage.py shell

```
PS D:\BIT_CSE_FDP\studCourseReg> python manage.py shell
Python 3.12.2 (tags/v3.12.2:6abddd9, Feb  6 2024, 21:26:36) [MSC v.1937 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
(InteractiveConsole)
>>>
```

In interactive python console import the model student and course as shown below
from studCourseRegApp.models import student,course

```
Python 3.12.2 (tags/v3.12.2:6abddd9, Feb  6 2024, 21:26:36) [MSC v.1937 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
(InteractiveConsole)
>>> from studCourseRegApp.models import student,course
>>>
```

Create student objects as given below in the interactive python console
>>>s1=student(usn= '1BI21CS001',name= 'Harish', sem=6)
>>>s2=student(usn= '1BI21CS002',name= 'Kumar', sem=6)
>>>s3=student(usn= '1BI21CS003',name= 'Chetan, sem=6)
>>>s4=student(usn= '1BI21CS004',name= 'Rama', sem=6)
>>>s5=student(usn= '1BI21CS005',name= 'Krishna, sem=6)
>>>s6=student(usn= '1BI21CS007',name= 'XYZ, sem=6)

```
>>> s1=student(usn= '1BI21CS001',name= 'Harish', sem=6)
>>> s2=student(usn= '1BI21CS002',name= 'Kumar', sem=6)
>>> s3=student(usn= '1BI21CS003',name= 'Chetan', sem=6)
>>> s4=student(usn= '1BI21CS004',name= 'Rama', sem=6)
>>> s5=student(usn= '1BI21CS005',name= 'Krishna', sem=6)
>>> s6=student(usn= '1BI21CS007',name= 'XYZ', sem=6)
```

Make the list of students write a for loop and save each student object the student table as show below
studList=[s1,s2,s3,s4,s5,s6]
for stud in studList:

```
...     stud.save()
>>> studList=[s1,s2,s3,s4,s5,s6]
>>> for stud in studList:
...     stud.save()
...
>>>
```

Similarly add the following courses to the course table

```
>>>c1=course(courseCode='21CS61',courseName='SE',courseCredits=3)
>>>c2=course(courseCode='21CS62',courseName='FSD',courseCredits=3)
>>>c3=course(courseCode='21CS63',courseName='CGV',courseCredits=3)
>>>c4=course(courseCode='21CS64',courseName='DBMS',courseCredits=3)
>>>c5=course(courseCode='21CSL62',courseName='FSD Lab',courseCredits=2)
>>> courseList=[c1,c2,c3,c4,c5]
>>> for course in courseList:
...     course.save()
```

```
>>> c1=course(courseCode='21CS61',courseName='SE',courseCredits=3)
>>> c2=course(courseCode='21CS62',courseName='FSD',courseCredits=3)
>>> c3=course(courseCode='21CS63',courseName='CGV',courseCredits=3)
>>> c4=course(courseCode='21CS64',courseName='DBMS',courseCredits=3)
>>> c5=course(courseCode='21CSL62',courseName='FSD Lab',courseCredits=2)
>>> courseList=[c1,c2,c3,c4,c5]
>>> for course in courseList:
...     course.save()
...
>>>
```

Open Sqlite DB in VS code and check the student and Course Table [Every time you update the table close and open the Sqlite DB to view the updated data]

views.py

```
from django.http import HttpResponse

from django.shortcuts import render

from studCourseRegApp.models import student,course, projectForm


# Create your views here.

def home(request):

    return render(request,'home.html')


def studentlist(request):
```

```
    s=student.objects.all()
    return render(request,'studentlist.html',{'student_list':s})

def courselist(request):
    c=course.objects.all()
    return render(request,'courselist.html',{'course_list':c})

def register(request):
    if request.method=="POST":
        sid=request.POST.get("student")
        cid=request.POST.get("course")
        studentobj=student.objects.get(id=sid)
        courseobj=course.objects.get(id=cid)
        res=studentobj.courses.filter(id=cid)
        if res:
            resp="<h1>Student with usn %s has already enrolled for the
%s<h1>"%(studentobj.usn,courseobj.courseCode)
            return HttpResponse(resp)
        studentobj.courses.add(courseobj)
        resp="<h1>student with usn %s successfully enrolled for the course with sub code
%s</h1>"%(studentobj.usn,courseobj.courseCode)
        return HttpResponse(resp)
    else:
        studentlist=student.objects.all()
        courselist=course.objects.all()
        return render(request,'register.html',{'student_list':studentlist,'course_list':courselist})

def enrolledStudents(request):
    if request.method=="POST":
        cid=request.POST.get("course")
        courseobj=course.objects.get(id=cid)
        studentlistobj=courseobj.student_set.all()
        return render(request,'enrolledlist.html',{'course':courseobj,'student_list':studentlistobj})
```

```
    else:
        courselist=course.objects.all()
        return render(request,'enrolledlist.html',{'Course_List':courselist})
```

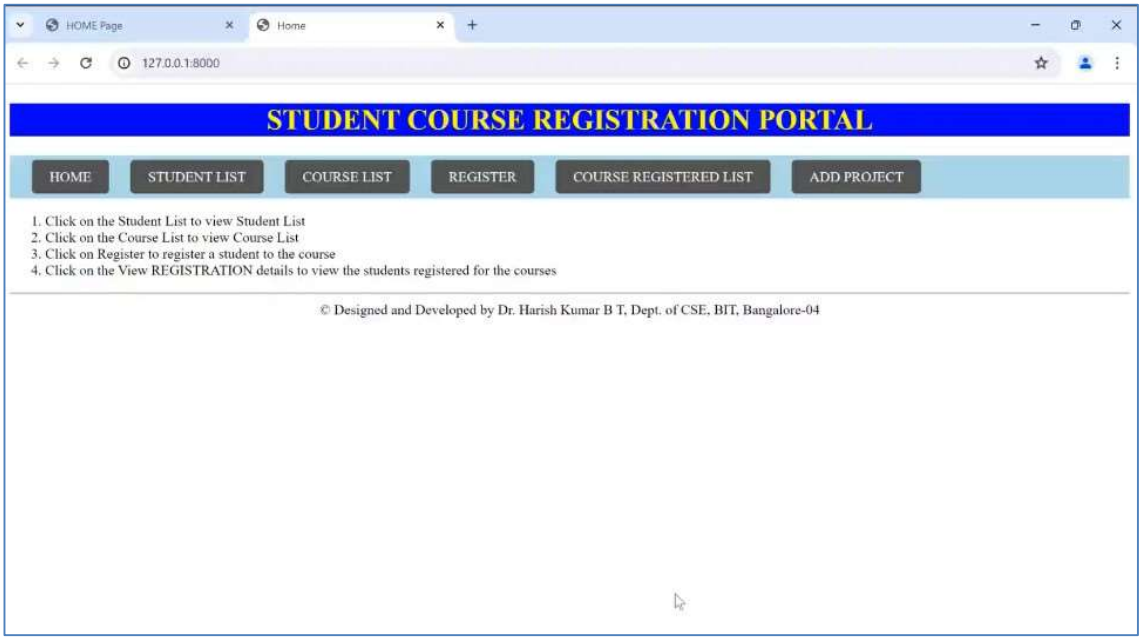
urls.py

```
from django.contrib import admin
from django.urls import path
from studCourseRegApp.views import home, studentlist,courselist,register,enrolledStudents
urlpatterns = [
    path('secretadmin/', admin.site.urls),
    path('',home),
    path('home/',home),
    path('studentlist/',studentlist),
    path('courselist/',courselist),
    path('register/',register),
    path('enrolledlist/',enrolledStudents),
]
```

settings.py(only one change inside installed apps add studCourseRegApp)

```
# Application definition

INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'studCourseRegApp',
]
```

OUTPUT


HOME Page
Home
127.0.0.1:8000
STUDENT COURSE REGISTRATION PORTAL
HOME
STUDENT LIST
COURSE LIST
REGISTER
COURSE REGISTERED LIST
ADD PROJECT
1. Click on the Student List to view Student List
2. Click on the Course List to view Course List
3. Click on Register to register a student to the course
4. Click on the View REGISTRATION details to view the students registered for the courses
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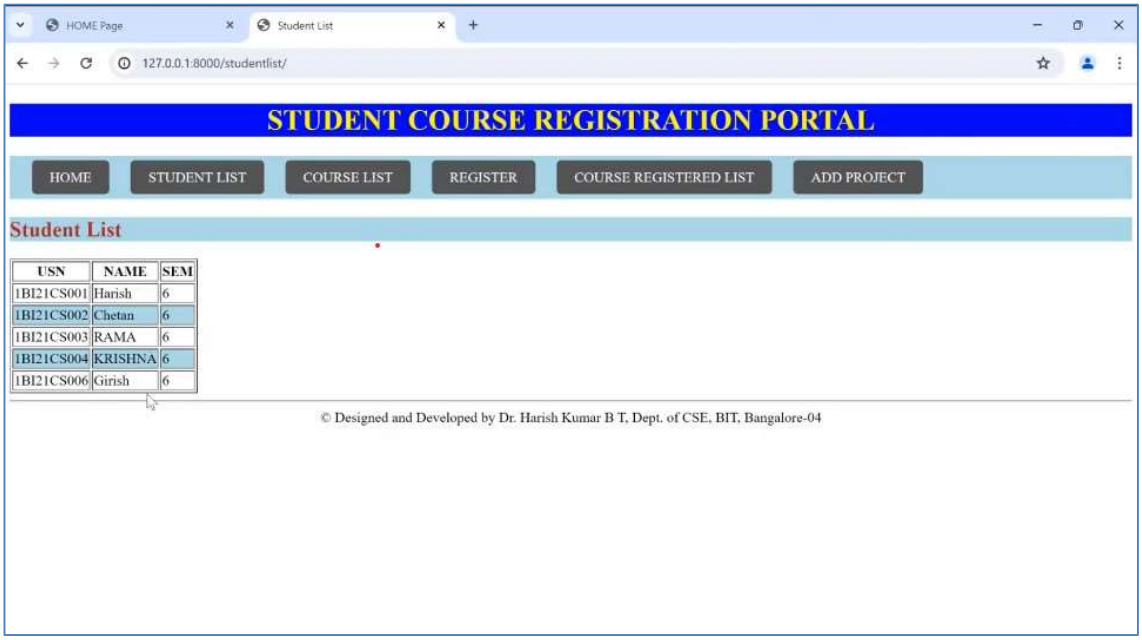
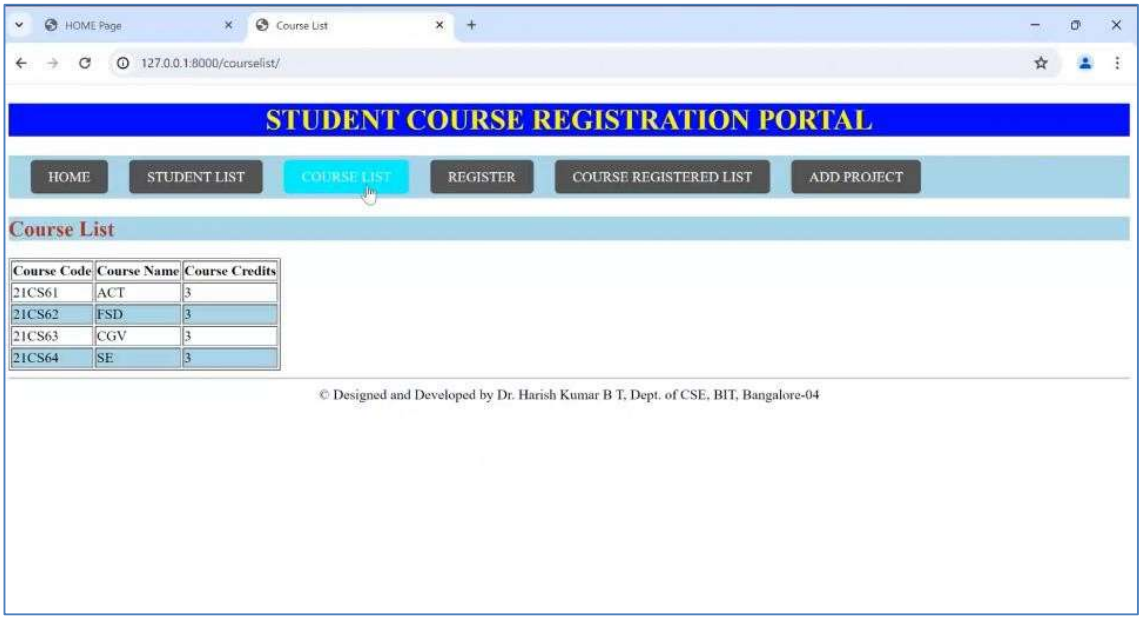
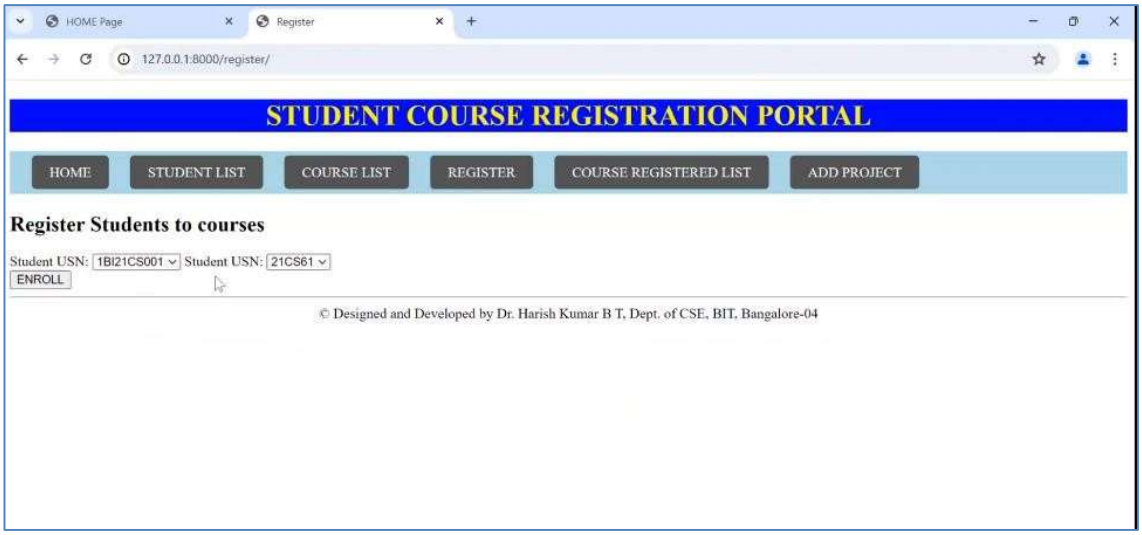

HOME Page
Student List
127.0.0.1:8000/studentlist/
STUDENT COURSE REGISTRATION PORTAL
HOME
STUDENT LIST
COURSE LIST
REGISTER
COURSE REGISTERED LIST
ADD PROJECT
Student List
USN NAME SEM
1BI21CS001 Harish 6
1BI21CS002 Chetan 6
1BI21CS003 RAMA 6
1BI21CS004 KRISHNA 6
1BI21CS006 Girish 6
© Designed and Developed by Dr. Harish Kumar B T, Dept. of CSE, BIT, Bangalore-04


HOME Page
Course List
127.0.0.1:8000/courselist/
STUDENT COURSE REGISTRATION PORTAL
HOME
STUDENT LIST
COURSE LIST
REGISTER
COURSE REGISTERED LIST
ADD PROJECT
Course List
Course Code | Course Name | Course Credits
21CS61 | ACT | 3
21CS62 | FSD | 3
21CS63 | CGV | 3
21CS64 | SE | 3
© Designed and Developed by Dr. Harish Kumar B T, Dept. of CSE, BIT, Bangalore-04


HOME Page
Register
127.0.0.1:8000/register/
STUDENT COURSE REGISTRATION PORTAL
HOME
STUDENT LIST
COURSE LIST
REGISTER
COURSE REGISTERED LIST
ADD PROJECT
Register Students to courses
Student USN: 1BI21CS001 Student USN: 21CS61
ENROLL
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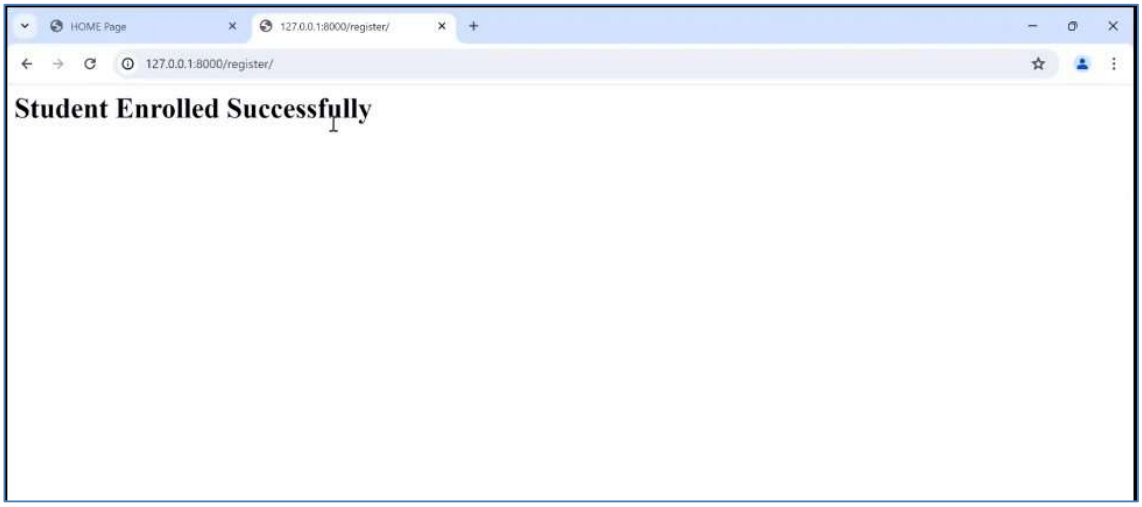
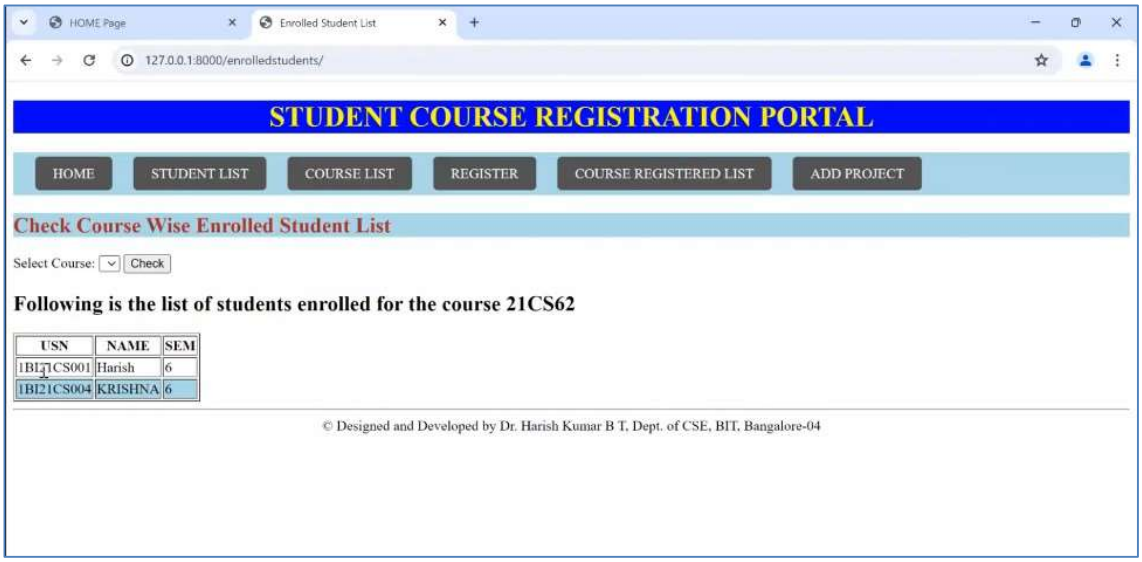




PROGRAM 3

3.1 . For student and course models created in Lab experiment for Module2, register admin interfaces, perform migrations and illustrate data entry through admin forms.

basicTemplate.html

```
<!DOCTYPE html>
<html>
  <head>
    <style>
      nav{background-color: lightblue;padding: 15px;  }
      nav a {
  color: #fff; /* Text color */
  text-decoration: none; /* Remove underline */
```

```
    padding: 10px 20px; /* Padding around each link */
    margin: 0px 10px; /* Spacing between links */
    border-radius: 5px; /* Rounded corners */
    background-color: #555;
    flex-wrap: wrap;

}

nav a:hover {
    background-color:aqua;/* Background color on hover */
}
ul {
        list-style: none;
        margin: 0;
        padding: 0;
        display: flex; /* Use flexbox */
        flex-wrap: wrap; /* Allow items to wrap to the next line */
        flex-direction: row; /* Display items in a column */
    }
    li {
        margin-right: 20px;
        margin-bottom: 25px;
    }

    </style>
    <title>
        {% block title %} {% endblock %}
    </title>
  </head>

  <body>
    <center> <h1 style="background-color: blue;color:yellow"> STUDENT COURSE
REGISTRATION PORTAL</h1></center>
    <nav>
```

```
                <ul>
        <li>  <a href="/home/">HOME</a></li>
         <li> <a href="/studentlist/">STUDENT LIST</a></li>
        <li>  <a href="/courselist/">COURSE LIST</a> </li>
         <li> <a href="/register/">REGISTER</a></li>
        <li>  <a href="/enrolledlist/">ENROLLED LIST</a></li>
         <li> <a href="/addproject/">ADD PROJECT</a></li>
          <li><a href="/genericlistviewstudent/">GENERIC STUDENT LIST VIEW</a></li>
         <li> <a href="/download_course_table_as_csv/">DOWNLOAD COURSE AS
CSV</a> </li>
         <li> <a href="/download_course_table_as_pdf/">DWONLOAD COURSE AS
PDF</a></li>
</ul>
      </nav>
      <section>
       {% block content %} {% endblock %}
   </section>
   <footer>
      <hr/>
      <center>
         &copy; Designed and Developeb by Dr. Harish Kumar B T, Dept. of CSE, BIT,
Bangalore-04
      </center>
   </footer>

   </body>
</html>
```

home.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Home Page {% endblock %}

{% block content %}
```

```
<li>Click on Student List to get the List of students</li>
<li> Click on Course List to get the list of courses</li>
<li>click on register to enroll student to a course</li>

{% endblock %}
```

studentlist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Student List {% endblock %}
{% block content%}
<h1>Student List</h1>
<table border="1">
   <tr>
      <th>
         USN
      </th>
      <th>
         NAME
      </th>
      <th>
         SEM
      </th>
   </tr>

   {% for s in student_list %}
   <tr>
      <td>{{s.usn}}</td>
      <td>{{s.name}}</td>
      <td>{{s.sem}}</td>
   </tr>
   {% endfor %}

</table>
{% endblock %}
```

courselist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course List {% endblock %}



{% block content%}
<h1> Course List</h1>
<table border="1">
   <tr>
      <th>
         Sub Code
      </th>
      <th>
         Sub Name
      </th>
      <th>
         Credits
      </th>
   </tr>

   {% for c in course_list %}
   <tr>
      <td>{{c.courseCode}}</td>
      <td>{{c.courseName}}</td>
      <td>{{c.courseCredits}}</td>
   </tr>
   {% endfor %}

</table>

{% endblock %}
```

enrolledlist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course Registration Details {% endblock %}

{% block content %}


<form method="POST" action="">
    {% csrf_token %}
    Select Course:
    <select name="course">
        {% for c in Course_List %}
        <option value="{{c.id}}">{{c.courseCode}}</option>
        {% endfor %}
    </select>
    <input type="submit" value="Search"/>
    {% if student_list %}
    <h1> List of Students registered of the course {{course.courseCode}}</h1>
<table border="1">

    <tr>
        <th>
            USN
        </th>
        <th>
            NAME
        </th>
        <th>
            SEM
        </th>
    </tr>

    {% for s in student_list %}
    <tr>
```

```
        <td>{{s.usn}}</td>
        <td>{{s.name}}</td>
        <td>{{s.sem}}</td>
    </tr>
    {% endfor %}
</table>
{% endif %}
</form>

{% endblock %}
```

register.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course Register Page {% endblock %}

{% block content %}
<h1> Student Course Registration</h1>
<form method="POST" action="">
  {% csrf_token %}
  Select USN:
  <select name="student">
    {% for s in student_list %}
    <option value="{{s.id}}">{{s.usn}}</option>
    {% endfor %}
  </select>

  Select Course:
  <select name="course">
    {% for c in course_list %}
    <option value="{{c.id}}">{{c.courseCode}}</option>
    {% endfor %}
  </select>
  <input type="submit" value="ENROLL"/>
</form>
```

```
{% endblock %}
```

projectreg.html

```
{% extends 'basicTemplate.html' %}
        {% block title %}   Project Details Registration {% endblock %}
       {% block content %}
   <form method="POST" action="">
       {% csrf_token %}
   <table border="1">
       {{ form.as_table }}
       <tr>
         <td>
          <input type="submit" value="Add Project"/>
         </td>
       </tr>
   </table>
</form>
{% endblock %}
```

admin.py

```
from django.contrib import admin

from studCourseRegApp.models import student,course

# Register your models here.

#admin.site.register(student)
#admin.site.register(course)

admin.site.site_header='FDP ON Django'
admin.site.site_title='FDP ON Django'
```

```
@admin.register(student)
class studentAdmin(admin.ModelAdmin):
    list_display=('usn','name')
    ordering=('usn',)
    search_fields=('name',)

@admin.register(course)
class courseAdmin(admin.ModelAdmin):
    list_display=('courseCode','courseName')
    ordering=('courseCode',)
    search_fields=('courseName',)
```

models.py

```
from django.db import models
from django.forms import ModelForm

# Create your models here.

class course(models.Model):
    courseCode=models.CharField(max_length=10)
    courseName=models.CharField(max_length=50)
    courseCredits=models.IntegerField()

    def __str__(self):
        return self.courseCode+" "+self.courseName+" "+str(self.courseCredits)


class student(models.Model):
    usn=models.CharField(max_length=10)
    name=models.CharField(max_length=40)
    sem=models.IntegerField()
    courses=models.ManyToManyField(course,related_name='student_set')
    def __str__(self):
        return self.usn+" "+self.name+" "+str(self.sem)
```

```
class projectReg(models.Model):
    student=models.ForeignKey(student,on_delete=models.CASCADE)
    ptitle=models.CharField(max_length=30)
    planguage=models.CharField(max_length=30)
    pduration=models.IntegerField()

class projectForm(ModelForm):
    required_css_class="required"
    class Meta:
        model=projectReg
        fields=['student','ptitle','planguage','pduration']
```

After writing models.py run the below commands in VS code terminal.

python manage.py makemigrations

python manage.py migrate

```
import django.db.models.deletion
from django.db import migrations, models


class Migration(migrations.Migration):

    dependencies = [
        ('studCourseRegApp', '0001_initial'),
    ]

    operations = [
        migrations.CreateModel(
            name='projectReg',
            fields=[
                ('id', models.BigAutoField(auto_created=True, primary_key=True, serialize=False,
verbose_name='ID')),
```

```
            ('ptitle', models.CharField(max_length=30)),
            ('planguage', models.CharField(max_length=30)),
            ('pduration', models.IntegerField()),
            ('student', models.ForeignKey(on_delete=django.db.models.deletion.CASCADE,
to='studCourseRegApp.student')),
        ],
    ),
]
```

After writing models.py run the below commands in VS code terminal.

python manage.py makemigrations

python manage.py migrate

views.py

```
from django.http import HttpResponse
from django.shortcuts import render
from studCourseRegApp.models import student,course, projectForm

# Create your views here.
def home(request):
    return render(request,'home.html')

def studentlist(request):
    s=student.objects.all()
    return render(request,'studentlist.html',{'student_list':s})

def courselist(request):
    c=course.objects.all()
    return render(request,'courselist.html',{'course_list':c})

def register(request):
    if request.method=="POST":
        sid=request.POST.get("student")
        cid=request.POST.get("course")
```

```
        studentobj=student.objects.get(id=sid)
        courseobj=course.objects.get(id=cid)
        res=studentobj.courses.filter(id=cid)
        if res:
            resp="<h1>Student with usn %s has already enrolled for the
%s<h1>"%(studentobj.usn,courseobj.courseCode)
            return HttpResponse(resp)
        studentobj.courses.add(courseobj)
        resp="<h1>student with usn %s successfully enrolled for the course with sub code
%s</h1>"%(studentobj.usn,courseobj.courseCode)
        return HttpResponse(resp)
    else:
        studentlist=student.objects.all()
        courselist=course.objects.all()
        return render(request,'register.html',{'student_list':studentlist,'course_list':courselist})

def enrolledStudents(request):
    if request.method=="POST":
        cid=request.POST.get("course")
        courseobj=course.objects.get(id=cid)
        studentlistobj=courseobj.student_set.all()
        return render(request,'enrolledlist.html',{'course':courseobj,'student_list':studentlistobj})

    else:
        courselist=course.objects.all()
        return render(request,'enrolledlist.html',{'Course_List':courselist})

def add_project(request):
    if request.method=="POST":
        form=projectForm(request.POST)
        if form.is_valid():
            form.save()
            return HttpResponse("<h1>Project Data Successfully saved</h1>")
        else:
```

```
            return HttpResponse("<h1>Project details not saved</h1>")
    else:
        form=projectForm()
        return render(request, "projectReg.html",{'form':form})
```

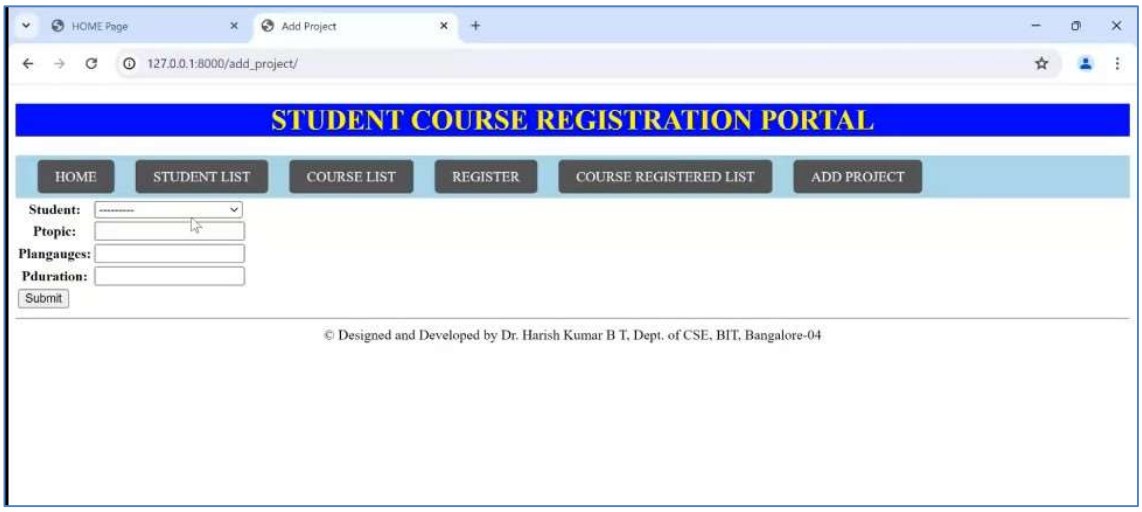
urls.py

```
from django.contrib import admin
from django.urls import path
from studCourseRegApp.views import enrolledStudentsUsingAjax, generateCSV, home,
registerAjax, studentlist,courselist,register,enrolledStudents,add_project,
urlpatterns = [
    path('secretadmin/', admin.site.urls),
    path('',home),
    path('home/',home),
    path('studentlist/',studentlist),
    path('courselist/',courselist),
    path('register/',register),
    path('enrolledlist/',enrolledStudents),
    path('addproject/',add_project),

 ]
```

settings.py(only one change inside installed apps add studCourseRegApp)

```
# Application definition

INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'studCourseRegApp',
]
```

OUTPUT


HOME Page
Add Project
127.0.0.1:8000/add_project/
STUDENT COURSE REGISTRATION PORTAL
HOME
STUDENT LIST
COURSE LIST
REGISTER
COURSE REGISTERED LIST
ADD PROJECT
Student:

Ptopic:
Plangauges:
Pduration:
Submit
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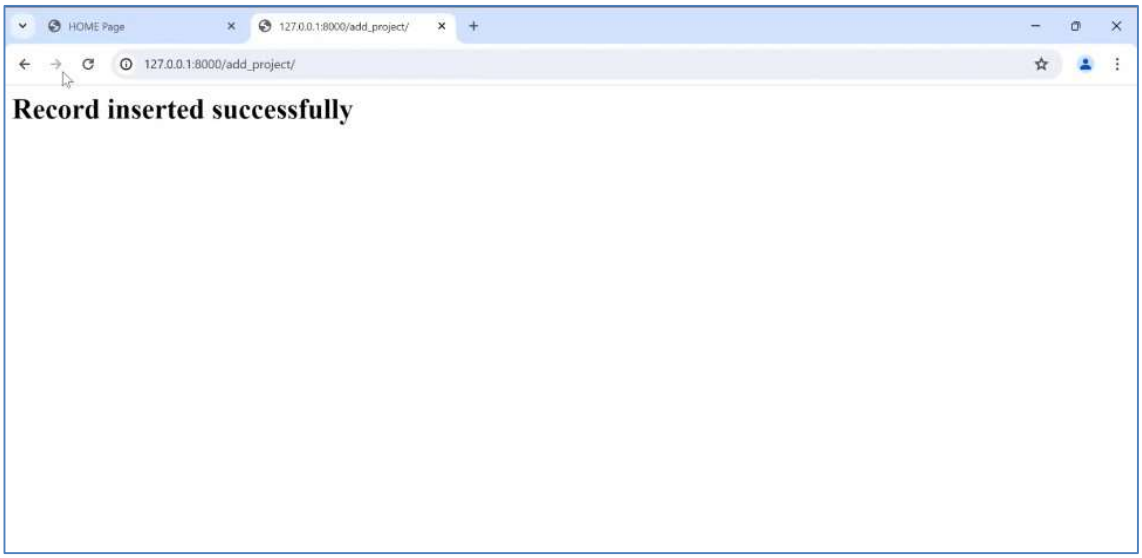

HOME Page
127.0.0.1:8000/add_project/
127.0.0.1:8000/add_project/
Record inserted successfully

3.2 . Develop a Model form for student that contains his topic chosen for project, languages used and duration with a model called project.

basicTemplate.html

```
<!DOCTYPE html>
<html>
   <head>
      <style>
         nav{background-color: lightblue;padding: 15px;  }
         nav a {
   color: #fff; /* Text color */
   text-decoration: none; /* Remove underline */
   padding: 10px 20px; /* Padding around each link */
   margin: 0px 10px; /* Spacing between links */
   border-radius: 5px; /* Rounded corners */
   background-color: #555;
   flex-wrap: wrap;

}
```

```
nav a:hover {
   background-color:aqua;/* Background color on hover */
}
ul {
          list-style: none;
          margin: 0;
          padding: 0;
          display: flex; /* Use flexbox */
          flex-wrap: wrap; /* Allow items to wrap to the next line */
          flex-direction: row; /* Display items in a column */
       }
       li {
          margin-right: 20px;
          margin-bottom: 25px;
       }

       </style>
       <title>
          {% block title %} {% endblock %}
       </title>
   </head>

   <body>
       <center> <h1 style="background-color: blue;color:yellow"> STUDENT COURSE
REGISTRATION PORTAL</h1></center>
       <nav>
                    <ul>
         <li>  <a href="/home/">HOME</a></li>
          <li> <a href="/studentlist/">STUDENT LIST</a></li>
         <li>  <a href="/courselist/">COURSE LIST</a> </li>
          <li> <a href="/register/">REGISTER</a></li>
         <li>  <a href="/enrolledlist/">ENROLLED LIST</a></li>
          <li> <a href="/addproject/">ADD PROJECT</a></li>
```

```
          <li><a href="/genericlistviewstudent/">GENERIC STUDENT LIST VIEW</a></li>
         <li> <a href="/download_course_table_as_csv/">DOWNLOAD COURSE AS
CSV</a> </li>
         <li> <a href="/download_course_table_as_pdf/">DWONLOAD COURSE AS
PDF</a></li>
</ul>
       </nav>
      <section>
       {% block content %} {% endblock %}
   </section>
    <footer>
       <hr/>
       <center>
          &copy; Designed and Developeb by Dr. Harish Kumar B T, Dept. of CSE, BIT,
Bangalore-04
       </center>
    </footer>

   </body>
</html>
```

home.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Home Page {% endblock %}

{% block content %}

<li>Click on Student List to get the List of students</li>
<li> Click on Course List to get the list of courses</li>
<li>click on register to enroll student to a course</li>

{% endblock %}
```

studentlist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Student List {% endblock %}
{% block content%}
<h1>Student List</h1>
<table border="1">
   <tr>
      <th>
         USN
      </th>
      <th>
         NAME
      </th>
      <th>
         SEM
      </th>
   </tr>

   {% for s in student_list %}
   <tr>
      <td>{{s.usn}}</td>
      <td>{{s.name}}</td>
      <td>{{s.sem}}</td>
   </tr>
   {% endfor %}

</table>
{% endblock %}
```

courselist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course List {% endblock %}
```

```
{% block content%}
<h1> Course List</h1>
<table border="1">
   <tr>
      <th>
         Sub Code
      </th>
      <th>
         Sub Name
      </th>
      <th>
         Credits
      </th>
   </tr>

   {% for c in course_list %}
   <tr>
      <td>{{c.courseCode}}</td>
      <td>{{c.courseName}}</td>
      <td>{{c.courseCredits}}</td>
   </tr>
   {% endfor %}

</table>

{% endblock %}
```

enrolledlist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course Registration Details {% endblock %}

{% block content %}
```

```
<form method="POST" action="">
    {% csrf_token %}
    Select Course:
    <select name="course">
        {% for c in Course_List %}
        <option value="{{c.id}}">{{c.courseCode}}</option>
        {% endfor %}
    </select>
    <input type="submit" value="Search"/>
    {% if student_list %}
    <h1> List of Students registered of the course {{course.courseCode}}</h1>
<table border="1">

    <tr>
        <th>
            USN
        </th>
        <th>
            NAME
        </th>
        <th>
            SEM
        </th>
    </tr>

    {% for s in student_list %}
    <tr>
        <td>{{s.usn}}</td>
        <td>{{s.name}}</td>
        <td>{{s.sem}}</td>
    </tr>
    {% endfor %}
</table>
{% endif %}
```

```
</form>

{% endblock %}
```

register.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course Register Page {% endblock %}

{% block content %}
<h1> Student Course Registration</h1>
<form method="POST" action="">
  {% csrf_token %}
  Select USN:
  <select name="student">
    {% for s in student_list %}
    <option value="{{s.id}}">{{s.usn}}</option>
    {% endfor %}
  </select>

  Select Course:
  <select name="course">
    {% for c in course_list %}
    <option value="{{c.id}}">{{c.courseCode}}</option>
    {% endfor %}
  </select>
  <input type="submit" value="ENROLL"/>
</form>
{% endblock %}
```

projectreg.html

```
{% extends 'basicTemplate.html' %}
        {% block title %}    Project Details Registration {% endblock %}
       {% block content %}
    <form method="POST" action="">
```

```
        {% csrf_token %}
    <table border="1">
        {{ form.as_table }}
        <tr>
          <td>
           <input type="submit" value="Add Project"/>
          </td>
        </tr>
    </table>
</form>
{% endblock %}
```

models.py

```
from django.db import models
from django.forms import ModelForm

# Create your models here.

class course(models.Model):
    courseCode=models.CharField(max_length=10)
    courseName=models.CharField(max_length=50)
    courseCredits=models.IntegerField()

    def __str__(self):
        return self.courseCode+" "+self.courseName+" "+str(self.courseCredits)


class student(models.Model):
    usn=models.CharField(max_length=10)
    name=models.CharField(max_length=40)
    sem=models.IntegerField()
    courses=models.ManyToManyField(course,related_name='student_set')
    def _str_(self):
        return self.usn+" "+self.name+" "+str(self.sem)
```

```
class projectReg(models.Model):
    student=models.ForeignKey(student,on_delete=models.CASCADE)
    ptitle=models.CharField(max_length=30)
    planguage=models.CharField(max_length=30)
    pduration=models.IntegerField()

class projectForm(ModelForm):
    required_css_class="required"
    class Meta:
        model=projectReg
        fields=['student','ptitle','planguage','pduration']
```

After writing models.py run the below commands in VS code terminal.

python manage.py makemigrations

python manage.py migrate

views.py

```
from django.http import HttpResponse
from django.shortcuts import render
from studCourseRegApp.models import student,course, projectForm

# Create your views here.
def home(request):
    return render(request,'home.html')

def studentlist(request):
    s=student.objects.all()
    return render(request,'studentlist.html',{'student_list':s})

def courselist(request):
    c=course.objects.all()
    return render(request,'courselist.html',{'course_list':c})
```

```
def register(request):
    if request.method=="POST":
        sid=request.POST.get("student")
        cid=request.POST.get("course")
        studentobj=student.objects.get(id=sid)
        courseobj=course.objects.get(id=cid)
        res=studentobj.courses.filter(id=cid)
        if res:
            resp="<h1>Student with usn %s has already enrolled for the
%s<h1>"%(studentobj.usn,courseobj.courseCode)
            return HttpResponse(resp)
        studentobj.courses.add(courseobj)
        resp="<h1>student with usn %s successfully enrolled for the course with sub code
%s</h1>"%(studentobj.usn,courseobj.courseCode)
        return HttpResponse(resp)
    else:
        studentlist=student.objects.all()
        courselist=course.objects.all()
        return render(request,'register.html',{'student_list':studentlist,'course_list':courselist})

def enrolledStudents(request):
    if request.method=="POST":
        cid=request.POST.get("course")
        courseobj=course.objects.get(id=cid)
        studentlistobj=courseobj.student_set.all()
        return render(request,'enrolledlist.html',{'course':courseobj,'student_list':studentlistobj})

    else:
        courselist=course.objects.all()
        return render(request,'enrolledlist.html',{'Course_List':courselist})
```

```
def add_project(request):
    if request.method=="POST":
        form=projectForm(request.POST)
        if form.is_valid():
            form.save()
            return HttpResponse("<h1>Project Data Successfully saved</h1>")
        else:
            return HttpResponse("<h1>Project details not saved</h1>")
    else:
        form=projectForm()
        return render(request, "projectReg.html",{'form':form})
```

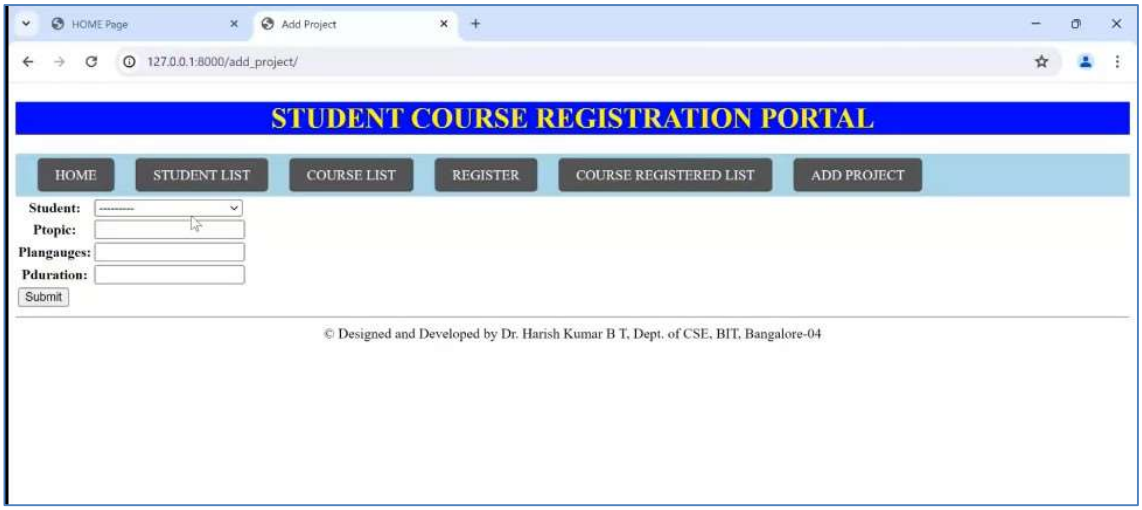
urls.py

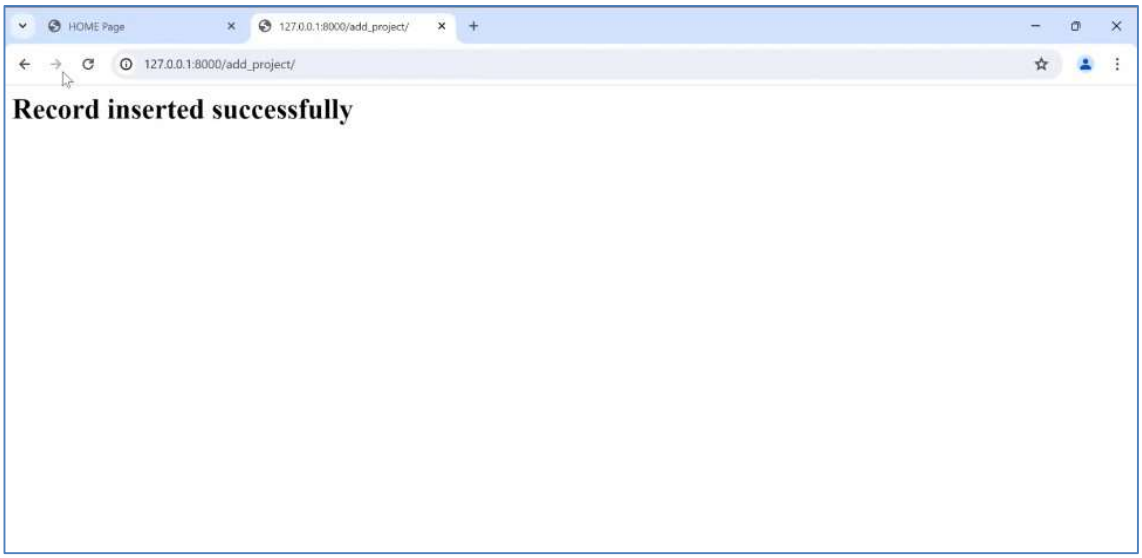
```
from django.contrib import admin
from django.urls import path
from studCourseRegApp.views import enrolledStudentsUsingAjax, generateCSV, home,
registerAjax,
studentlist,courselist,register,enrolledStudents,add_project,StudentListView,StudentDetailVie
w,generatePDF
urlpatterns = [
    path('secretadmin/', admin.site.urls),
    path('',home),
    path('home/',home),
    path('studentlist/',studentlist),
    path('courselist/',courselist),
    path('register/',register),
    path('enrolledlist/',enrolledStudents),
    path('addproject/',add_project),

]
```

settings.py(only one change inside installed apps add studCourseRegApp)

```
# Application definition

INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'studCourseRegApp',
]
```

OUTPUT




HOME Page
127.0.0.1:8000/add_project/
127.0.0.1:8000/add_project/
Record inserted successfully

PROGRAM 4

4.1 . For students enrolment developed in Module 2, create a generic class view which displays list of students and detail view that displays student details for any selected student in the list.

basicTemplate.html

```
<!DOCTYPE html>
<html>
   <head>
      <style>
         nav{background-color: lightblue;padding: 15px;  }
         nav a {
   color: #fff; /* Text color */
   text-decoration: none; /* Remove underline */
   padding: 10px 20px; /* Padding around each link */
   margin: 0px 10px; /* Spacing between links */
   border-radius: 5px; /* Rounded corners */
   background-color: #555;
   flex-wrap: wrap;

}

nav a:hover {
   background-color:aqua;/* Background color on hover */
}
ul {
         list-style: none;
         margin: 0;
         padding: 0;
         display: flex; /* Use flexbox */
         flex-wrap: wrap; /* Allow items to wrap to the next line */
```

```
        flex-direction: row; /* Display items in a column */
    }
    li {
        margin-right: 20px;
        margin-bottom: 25px;
    }

    </style>
    <title>
        {% block title %} {% endblock %}
    </title>
</head>

<body>
    <center> <h1 style="background-color: blue;color:yellow"> STUDENT COURSE
REGISTRATION PORTAL</h1></center>
    <nav>
                <ul>
      <li>  <a href="/home/">HOME</a></li>
       <li> <a href="/studentlist/">STUDENT LIST</a></li>
      <li>  <a href="/courselist/">COURSE LIST</a> </li>
       <li> <a href="/register/">REGISTER</a></li>
      <li>  <a href="/enrolledlist/">ENROLLED LIST</a></li>
       <li> <a href="/addproject/">ADD PROJECT</a></li>
        <li><a href="/genericlistviewstudent/">GENERIC STUDENT LIST VIEW</a></li>
       <li> <a href="/download_course_table_as_csv/">DOWNLOAD COURSE AS
CSV</a> </li>
        <li> <a href="/download_course_table_as_pdf/">DWONLOAD COURSE AS
PDF</a></li>
</ul>
    </nav>
    <section>
     {% block content %} {% endblock %}
</section>
```

```
    <footer>
        <hr/>
        <center>
            &copy; Designed and Developeb by Dr. Harish Kumar B T, Dept. of CSE, BIT,
Bangalore-04
        </center>
    </footer>

    </body>
</html>
```

home.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Home Page {% endblock %}

{% block content %}

<li>Click on Student List to get the List of students</li>
<li> Click on Course List to get the list of courses</li>
<li>click on register to enroll student to a course</li>

{% endblock %}
```

studentlist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Student List {% endblock %}
{% block content%}
<h1>Student List</h1>
<table border="1">
    <tr>
        <th>
            USN
        </th>
```

```
        <th>
            NAME
        </th>
        <th>
            SEM
        </th>
    </tr>

    {% for s in student_list %}
    <tr>
        <td>{{s.usn}}</td>
        <td>{{s.name}}</td>
        <td>{{s.sem}}</td>
    </tr>
    {% endfor %}

</table>
{% endblock %}
```

courselist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course List {% endblock %}



{% block content%}
<h1> Course List</h1>
<table border="1">
    <tr>
        <th>
            Sub Code
        </th>
        <th>
            Sub Name
```

```
        </th>
        <th>
            Credits
        </th>
    </tr>

    {% for c in course_list %}
    <tr>
        <td>{{c.courseCode}}</td>
        <td>{{c.courseName}}</td>
        <td>{{c.courseCredits}}</td>
    </tr>
    {% endfor %}

</table>

{% endblock %}
```

enrolledlist.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course Registration Details {% endblock %}

{% block content %}


<form method="POST" action="">
    {% csrf_token %}
    Select Course:
    <select name="course">
        {% for c in Course_List %}
        <option value="{{c.id}}">{{c.courseCode}}</option>
        {% endfor %}
    </select>
    <input type="submit" value="Search"/>
```

```
    {% if student_list %}
    <h1> List of Students registered of the course {{course.courseCode}}</h1>
<table border="1">

    <tr>
        <th>
            USN
        </th>
        <th>
            NAME
        </th>
        <th>
            SEM
        </th>
    </tr>

    {% for s in student_list %}
    <tr>
        <td>{{s.usn}}</td>
        <td>{{s.name}}</td>
        <td>{{s.sem}}</td>
    </tr>
    {% endfor %}
</table>
{% endif %}
</form>

{% endblock %}
```

register.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Course Register Page {% endblock %}

{% block content %}
```

```
<h1> Student Course Registration</h1>
<form method="POST" action="">
  {% csrf_token %}
  Select USN:
  <select name="student">
    {% for s in student_list %}
    <option value="{{s.id}}">{{s.usn}}</option>
    {% endfor %}
  </select>

  Select Course:
  <select name="course">
    {% for c in course_list %}
    <option value="{{c.id}}">{{c.courseCode}}</option>
    {% endfor %}
  </select>
  <input type="submit" value="ENROLL"/>
</form>
{% endblock %}
```

GenericListViewStudent.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Generic Student List View {% endblock %}
{% block content %}
{% if student_list %}
<table border="1">
    <tr>
        <th>USN</th>
        <th>Courses Enrolled</th>
    </tr>

    {% for student in student_list %}
    <tr>
```

```
        <td>
            <a href="/genericdetailedviewstudent/{{student.pk}}">{{student.usn}}</a>
        </td>
        <td>
            {% for course in student.courses.all %}
            <span>{{course.courseName}}</span>
            {% endfor %}
        </td>
    </tr>
    {% endfor %}
</table>
{% else %}
<h1>No Students Enrolled</h1>
{% endif %}
{% endblock %}
```

GenericDetailedViewStudent.html

```
{% extends 'basicTemplate.html' %}
{% block title %} Detailed Student View {% endblock %}
{% block content %}

<h1> Student Name: {{student.name}}</h1>
<h1>Student USN: {{student.usn}}</h1>
<h1> Student Sem: {{student.sem}}</h1>

{% endblock %}
```

models.py

```
from django.db import models
from django.forms import ModelForm

# Create your models here.

class course(models.Model):
```

```
    courseCode=models.CharField(max_length=10)
    courseName=models.CharField(max_length=50)
    courseCredits=models.IntegerField()

    def __str__(self):
        return self.courseCode+" "+self.courseName+" "+str(self.courseCredits)


class student(models.Model):
    usn=models.CharField(max_length=10)
    name=models.CharField(max_length=40)
    sem=models.IntegerField()
    courses=models.ManyToManyField(course,related_name='student_set')
    def __str__(self):
        return self.usn+" "+self.name+" "+str(self.sem)

class projectReg(models.Model):
    student=models.ForeignKey(student,on_delete=models.CASCADE)
    ptitle=models.CharField(max_length=30)
    planguage=models.CharField(max_length=30)
    pduration=models.IntegerField()

class projectForm(ModelForm):
    required_css_class="required"
    class Meta:
        model=projectReg
        fields=['student','ptitle','planguage','pduration']
```

After writing models.py run the below commands in VS code terminal.

python manage.py makemigrations

python manage.py migrate

views.py

```
from django.http import HttpResponse
```

```
from django.shortcuts import render
from studCourseRegApp.models import student,course, projectForm

# Create your views here.
def home(request):
    return render(request,'home.html')

def studentlist(request):
    s=student.objects.all()
    return render(request,'studentlist.html',{'student_list':s})

def courselist(request):
    c=course.objects.all()
    return render(request,'courselist.html',{'course_list':c})

def register(request):
    if request.method=="POST":
        sid=request.POST.get("student")
        cid=request.POST.get("course")
        studentobj=student.objects.get(id=sid)
        courseobj=course.objects.get(id=cid)
        res=studentobj.courses.filter(id=cid)
        if res:
            resp="<h1>Student with usn %s has already enrolled for the
%s<h1>"%(studentobj.usn,courseobj.courseCode)
            return HttpResponse(resp)
        studentobj.courses.add(courseobj)
        resp="<h1>student with usn %s successfully enrolled for the course with sub code
%s</h1>"%(studentobj.usn,courseobj.courseCode)
        return HttpResponse(resp)
    else:
        studentlist=student.objects.all()
        courselist=course.objects.all()
        return render(request,'register.html',{'student_list':studentlist,'course_list':courselist})
```

```
def enrolledStudents(request):
    if request.method=="POST":
        cid=request.POST.get("course")
        courseobj=course.objects.get(id=cid)
        studentlistobj=courseobj.student_set.all()
        return render(request,'enrolledlist.html',{'course':courseobj,'student_list':studentlistobj})

    else:
        courselist=course.objects.all()
        return render(request,'enrolledlist.html',{'Course_List':courselist})



def add_project(request):
    if request.method=="POST":
        form=projectForm(request.POST)
        if form.is_valid():
            form.save()
            return HttpResponse("<h1>Project Data Successfully saved</h1>")
        else:
            return HttpResponse("<h1>Project details not saved</h1>")
    else:
        form=projectForm()
        return render(request, "projectReg.html",{'form':form})



from django.views import generic
class StudentListView(generic.ListView):
    model=student
    template_name="GenericListViewStudent.html"

class StudentDetailView(generic.DetailView):
    model=student
```

```
    template_name="GenericDetailedViewStudent.html"
```

urls.py

```
from django.contrib import admin
from django.urls import path
from studCourseRegApp.views import enrolledStudentsUsingAjax, generateCSV, home,
registerAjax,
studentlist,courselist,register,enrolledStudents,add_project,StudentListView,StudentDetailVie
w
urlpatterns = [
    path('secretadmin/', admin.site.urls),
    path('',home),
    path('home/',home),
    path('studentlist/',studentlist),
    path('courselist/',courselist),
    path('register/',register),
    path('enrolledlist/',enrolledStudents),
    path('addproject/',add_project),
    path('genericlistviewstudent/',StudentListView.as_view()),
    path('genericdetailedviewstudent/<int:pk>/',StudentDetailView.as_view()),
]
```

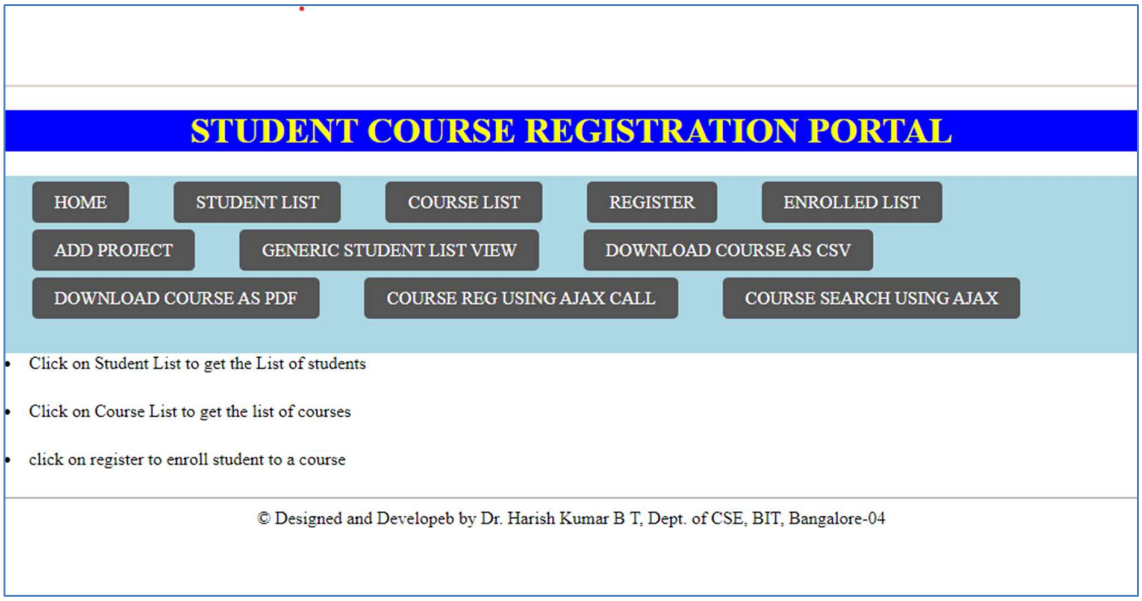
settings.py(only one change inside installed apps add studCourseRegApp)

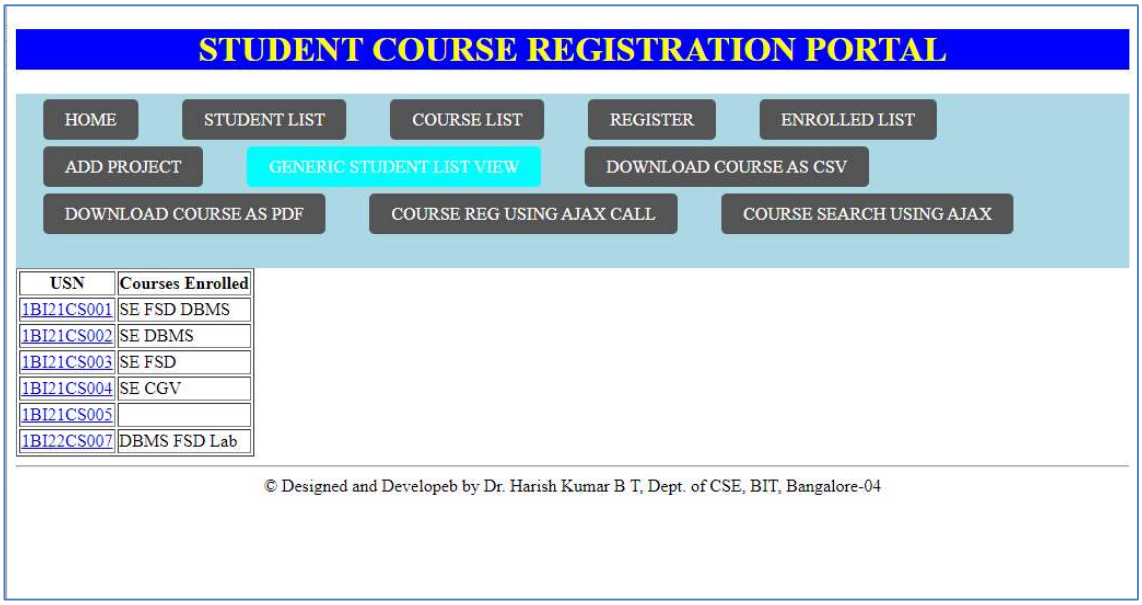
```
# Application definition

INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
```

'studCourseRegApp',

]

OUTPUT






STUDENT COURSE REGISTRATION PORTAL
HOME
STUDENT LIST
COURSE LIST
REGISTER
ENROLLED LIST
ADD PROJECT
GENERIC STUDENT LIST VIEW
DOWNLOAD COURSE AS CSV
DOWNLOAD COURSE AS PDF
COURSE REG USING AJAX CALL
COURSE SEARCH USING AJAX
Student Name: Harish
Student USN: 1BI21CS001
Student Sem: 6
© Designed and Developeb by Dr. Harish Kumar B T, Dept. of CSE, BIT, Bangalore-04

4.2 . Develop example Django app that performs CSV and PDF generation for any models created in previous laboratory component.

basicTemplate.html

```
<!DOCTYPE html>
<html>
   <head>
      <style>
         nav{background-color: lightblue;padding: 15px;  }
         nav a {
   color: #fff; /* Text color */
   text-decoration: none; /* Remove underline */
   padding: 10px 20px; /* Padding around each link */
   margin: 0px 10px; /* Spacing between links */
   border-radius: 5px; /* Rounded corners */
   background-color: #555;
   flex-wrap: wrap;

}

nav a:hover {
   background-color:aqua;/* Background color on hover */
}
ul {
         list-style: none;
         margin: 0;
         padding: 0;
         display: flex; /* Use flexbox */
         flex-wrap: wrap; /* Allow items to wrap to the next line */
         flex-direction: row; /* Display items in a column */
      }
      li {
         margin-right: 20px;
         margin-bottom: 25px;
      }
```

```
        </style>
        <title>
            {% block title %} {% endblock %}
        </title>
    </head>

    <body>
        <center> <h1 style="background-color: blue;color:yellow"> STUDENT COURSE
REGISTRATION PORTAL</h1></center>
        <nav>
                    <ul>
          <li>  <a href="/home/">HOME</a></li>
           <li> <a href="/studentlist/">STUDENT LIST</a></li>
          <li>  <a href="/courselist/">COURSE LIST</a> </li>
           <li> <a href="/register/">REGISTER</a></li>
          <li>  <a href="/enrolledlist/">ENROLLED LIST</a></li>
           <li> <a href="/addproject/">ADD PROJECT</a></li>
            <li><a href="/genericlistviewstudent/">GENERIC STUDENT LIST VIEW</a></li>
           <li> <a href="/download_course_table_as_csv/">DOWNLOAD COURSE AS
CSV</a> </li>
          <li> <a href="/download_course_table_as_pdf/">DWONLOAD COURSE AS
PDF</a></li>
</ul>
        </nav>
       <section>
        {% block content %} {% endblock %}
    </section>
    <footer>
        <hr/>
        <center>
            &copy; Designed and Developeb by Dr. Harish Kumar B T, Dept. of CSE, BIT,
Bangalore-04
        </center>
```

```
    </footer>

    </body>
</html>
```

models.py

```
from django.db import models
from django.forms import ModelForm

# Create your models here.

class course(models.Model):
    courseCode=models.CharField(max_length=10)
    courseName=models.CharField(max_length=50)
    courseCredits=models.IntegerField()

    def __str__(self):
        return self.courseCode+" "+self.courseName+" "+str(self.courseCredits)


class student(models.Model):
    usn=models.CharField(max_length=10)
    name=models.CharField(max_length=40)
    sem=models.IntegerField()
    courses=models.ManyToManyField(course,related_name='student_set')
    def _str_(self):
        return self.usn+" "+self.name+" "+str(self.sem)

class projectReg(models.Model):
    student=models.ForeignKey(student,on_delete=models.CASCADE)
    ptitle=models.CharField(max_length=30)
    planguage=models.CharField(max_length=30)
    pduration=models.IntegerField()
```

```
class projectForm(ModelForm):
    required_css_class="required"
    class Meta:
        model=projectReg
        fields=['student','ptitle','planguage','pduration']
```

After writing models.py run the below commands in VS code terminal.

python manage.py makemigrations

python manage.py migrate

views.py

```
from django.http import HttpResponse
from django.shortcuts import render
from studCourseRegApp.models import student,course, projectForm

# Create your views here.
def home(request):
    return render(request,'home.html')

def studentlist(request):
    s=student.objects.all()
    return render(request,'studentlist.html',{'student_list':s})

def courselist(request):
    c=course.objects.all()
    return render(request,'courselist.html',{'course_list':c})

def register(request):
    if request.method=="POST":
        sid=request.POST.get("student")
        cid=request.POST.get("course")
        studentobj=student.objects.get(id=sid)
        courseobj=course.objects.get(id=cid)
        res=studentobj.courses.filter(id=cid)
```

```
        if res:
            resp="<h1>Student with usn %s has already enrolled for the
%s<h1>"%(studentobj.usn,courseobj.courseCode)
            return HttpResponse(resp)
        studentobj.courses.add(courseobj)
        resp="<h1>student with usn %s successfully enrolled for the course with sub code
%s</h1>"%(studentobj.usn,courseobj.courseCode)
        return HttpResponse(resp)
    else:
        studentlist=student.objects.all()
        courselist=course.objects.all()
        return render(request,'register.html',{'student_list':studentlist,'course_list':courselist})

def enrolledStudents(request):
    if request.method=="POST":
        cid=request.POST.get("course")
        courseobj=course.objects.get(id=cid)
        studentlistobj=courseobj.student_set.all()
        return render(request,'enrolledlist.html',{'course':courseobj,'student_list':studentlistobj})

    else:
        courselist=course.objects.all()
        return render(request,'enrolledlist.html',{'Course_List':courselist})



def add_project(request):
    if request.method=="POST":
        form=projectForm(request.POST)
        if form.is_valid():
            form.save()
            return HttpResponse("<h1>Project Data Successfully saved</h1>")
        else:
            return HttpResponse("<h1>Project details not saved</h1>")
```

```
    else:
        form=projectForm()
        return render(request, "projectReg.html",{'form':form})



from django.views import generic
class StudentListView(generic.ListView):
    model=student
    template_name="GenericListViewStudent.html"

class StudentDetailView(generic.DetailView):
    model=student
    template_name="GenericDetailedViewStudent.html"

import csv
def generateCSV(request):
    courses=course.objects.all()
    resp=HttpResponse(content_type="text/csv")
    resp['Content-Disposition']='attachment; filename=course_data.csv'
    writer=csv.writer(resp)
    writer.writerow(['Course Code','Course Name','Course Credits'])
    for c in courses:
        writer.writerow([c.courseCode,c.courseName,c.courseCredits])
    return resp

from reportlab.lib.pagesizes import letter
from reportlab.platypus import SimpleDocTemplate, Table
def generatePDF(request):
    courses=course.objects.all()
    resp=HttpResponse(content_type="text/pdf")
    resp['Content-Disposition']='attachment; filename=course_data.pdf'
    pdf=SimpleDocTemplate(resp,pagesize=letter)

    table_data=[['Course Code','Course Name','Course Credits']]
```

```
    for c in courses:
        table_data.append([c.courseCode,c.courseName,str(c.courseCredits)])
    table=Table(table_data)
    pdf.build([table])
    return resp
```

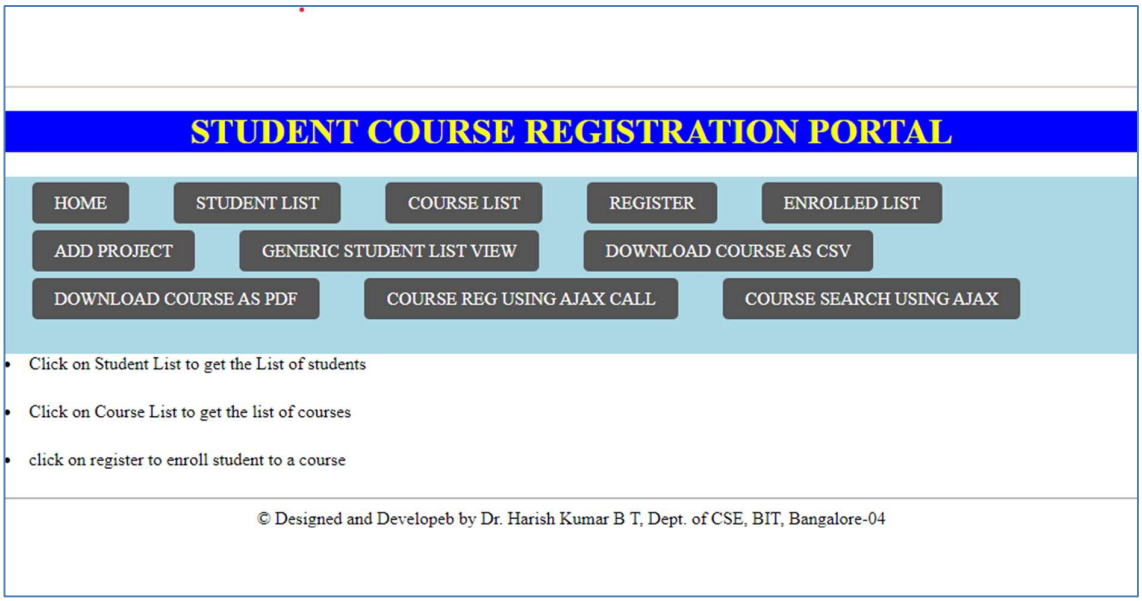
urls.py

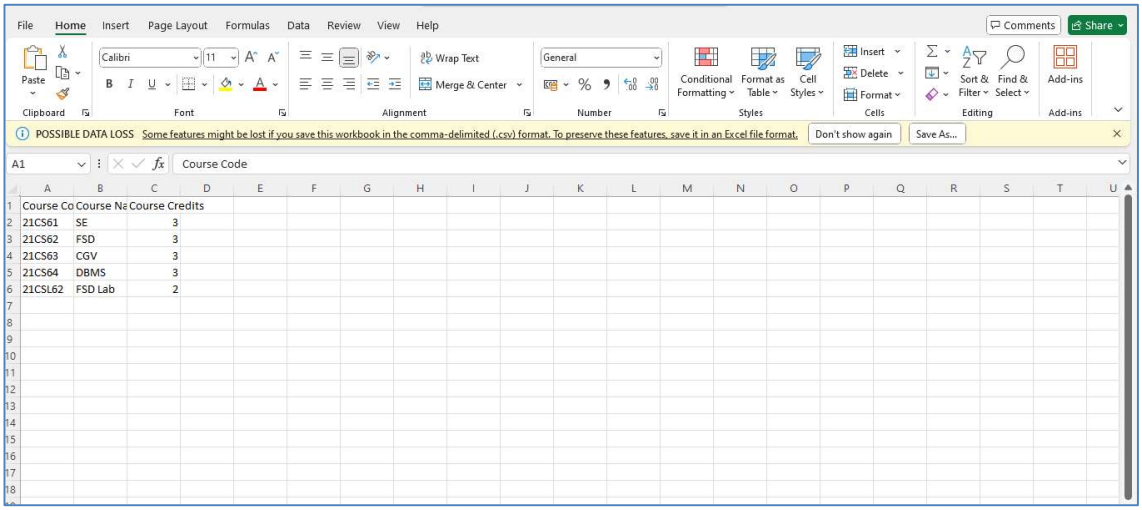
```
from django.contrib import admin
from django.urls import path
from studCourseRegApp.views import enrolledStudentsUsingAjax, generateCSV, home,
registerAjax,
studentlist,courselist,register,enrolledStudents,add_project,StudentListView,StudentDetailVie
w,generatePDF
urlpatterns = [
    path('secretadmin/', admin.site.urls),
    path('',home),
    path('home/',home),
    path('studentlist/',studentlist),
    path('courselist/',courselist),
    path('register/',register),
    path('enrolledlist/',enrolledStudents),
    path('addproject/',add_project),
    path('genericlistviewstudent/',StudentListView.as_view()),
    path('genericdetailedviewstudent/<int:pk>/',StudentDetailView.as_view()),
    path('download_course_table_as_csv/',generateCSV),
    path('download_course_table_as_pdf/',generatePDF),
```

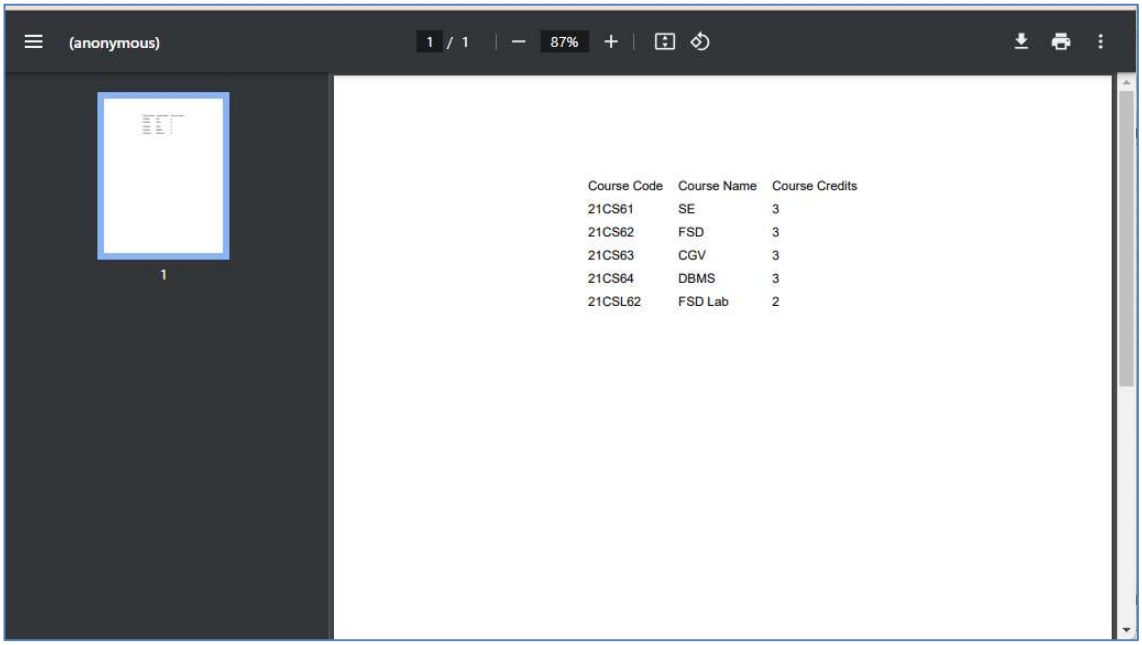
settings.py(only one change inside installed apps add studCourseRegApp)

```
# Application definition

INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'studCourseRegApp',
]
```

OUTPUT




File Home Insert Page Layout Formulas Data Review View Help
Comments Share
Paste Clipboard Calibri 11 Font Wrap Text Merge & Center Alignment General Number
Conditional Formatting Format as Table Cell Styles Styles
Insert Delete Format Cells Sort & Filter Find & Select Editing Add-ins
POSSIBLE DATA LOSS Some features might be lost if you save this workbook in the comma-delimited (.csv) format. To preserve these features, save it in an Excel file format. Don't show again Save As...
A1 Course Code
Course Co Course Na Course Credits
21CS61 SE 3
21CS62 FSD 3
21CS63 CGV 3
21CS64 DBMS 3
21CSL62 FSD Lab 2


(anonymous)
1 / 1
87%
1
Course Code Course Name Course Credits
21CS61 SE 3
21CS62 FSD 3
21CS63 CGV 3
21CS64 DBMS 3
21CSL62 FSD Lab 2

PROGRAM 5

5.1 . Develop a registration page for student enrolment as done in Module 2 but without page refresh using AJAX.

basicTemplate.html

```
<!DOCTYPE html>
<html>
   <head>
      <style>
         nav{background-color: lightblue;padding: 15px;  }
         nav a {
   color: #fff; /* Text color */
   text-decoration: none; /* Remove underline */
   padding: 10px 20px; /* Padding around each link */
   margin: 0px 10px; /* Spacing between links */
   border-radius: 5px; /* Rounded corners */
   background-color: #555;
   flex-wrap: wrap;

}

nav a:hover {
   background-color:aqua;/* Background color on hover */
}
ul {
         list-style: none;
         margin: 0;
         padding: 0;
         display: flex; /* Use flexbox */
         flex-wrap: wrap; /* Allow items to wrap to the next line */
         flex-direction: row; /* Display items in a column */
      }
      li {
         margin-right: 20px;
         margin-bottom: 25px;
```

```
    }

    </style>
    <title>
      {% block title %} {% endblock %}
    </title>
  </head>

  <body>
    <center> <h1 style="background-color: blue;color:yellow"> STUDENT COURSE REGISTRATION PORTAL</h1></center>
    <nav>
            <ul>
      <li>  <a href="/home/">HOME</a></li>
       <li> <a href="/studentlist/">STUDENT LIST</a></li>
      <li>  <a href="/courselist/">COURSE LIST</a> </li>
       <li> <a href="/register/">REGISTER</a></li>
      <li>  <a href="/enrolledlist/">ENROLLED LIST</a></li>
       <li> <a href="/addproject/">ADD PROJECT</a></li>
        <li><a href="/genericlistviewstudent/">GENERIC STUDENT LIST VIEW</a></li>
       <li> <a href="/download_course_table_as_csv/">DOWNLOAD COURSE AS CSV</a> </li>
       <li> <a href="/download_course_table_as_pdf/">DWONLOAD COURSE AS PDF</a></li>
</ul>
    </nav>
    <section>
     {% block content %} {% endblock %}
  </section>
  <footer>
    <hr/>
    <center>
      &copy; Designed and Developeb by Dr. Harish Kumar B T, Dept. of CSE, BIT, Bangalore-04
```

```
        </center>
    </footer>

    </body>
</html>
```

models.py

```
from django.db import models
from django.forms import ModelForm

# Create your models here.

class course(models.Model):
    courseCode=models.CharField(max_length=10)
    courseName=models.CharField(max_length=50)
    courseCredits=models.IntegerField()

    def __str__(self):
        return self.courseCode+" "+self.courseName+" "+str(self.courseCredits)


class student(models.Model):
    usn=models.CharField(max_length=10)
    name=models.CharField(max_length=40)
    sem=models.IntegerField()
    courses=models.ManyToManyField(course,related_name='student_set')
    def __str__(self):
        return self.usn+" "+self.name+" "+str(self.sem)

class projectReg(models.Model):
    student=models.ForeignKey(student,on_delete=models.CASCADE)
    ptitle=models.CharField(max_length=30)
    planguage=models.CharField(max_length=30)
    pduration=models.IntegerField()
```

```
class projectForm(ModelForm):
    required_css_class="required"
    class Meta:
        model=projectReg
        fields=['student','ptitle','planguage','pduration']
```

After writing models.py run the below commands in VS code terminal.

python manage.py makemigrations

python manage.py migrate

views.py

```
from django.http import HttpResponse
from django.shortcuts import render
from studCourseRegApp.models import student,course, projectForm

# Create your views here.
def home(request):
    return render(request,'home.html')

def studentlist(request):
    s=student.objects.all()
    return render(request,'studentlist.html',{'student_list':s})

def courselist(request):
    c=course.objects.all()
    return render(request,'courselist.html',{'course_list':c})

def register(request):
    if request.method=="POST":
        sid=request.POST.get("student")
        cid=request.POST.get("course")
        studentobj=student.objects.get(id=sid)
        courseobj=course.objects.get(id=cid)
```

```
        res=studentobj.courses.filter(id=cid)
        if res:
            resp="<h1>Student with usn %s has already enrolled for the
%s<h1>"%(studentobj.usn,courseobj.courseCode)
            return HttpResponse(resp)
        studentobj.courses.add(courseobj)
        resp="<h1>student with usn %s successfully enrolled for the course with sub code
%s</h1>"%(studentobj.usn,courseobj.courseCode)
        return HttpResponse(resp)
    else:
        studentlist=student.objects.all()
        courselist=course.objects.all()
        return render(request,'register.html',{'student_list':studentlist,'course_list':courselist})

def enrolledStudents(request):
    if request.method=="POST":
        cid=request.POST.get("course")
        courseobj=course.objects.get(id=cid)
        studentlistobj=courseobj.student_set.all()
        return render(request,'enrolledlist.html',{'course':courseobj,'student_list':studentlistobj})

    else:
        courselist=course.objects.all()
        return render(request,'enrolledlist.html',{'Course_List':courselist})



def add_project(request):
    if request.method=="POST":
        form=projectForm(request.POST)
        if form.is_valid():
            form.save()
            return HttpResponse("<h1>Project Data Successfully saved</h1>")
        else:
```

```
            return HttpResponse("<h1>Project details not saved</h1>")
    else:
        form=projectForm()
        return render(request, "projectReg.html",{'form':form})



from django.views import generic
class StudentListView(generic.ListView):
    model=student
    template_name="GenericListViewStudent.html"

class StudentDetailView(generic.DetailView):
    model=student
    template_name="GenericDetailedViewStudent.html"

import csv
def generateCSV(request):
    courses=course.objects.all()
    resp=HttpResponse(content_type="text/csv")
    resp['Content-Disposition']='attachment; filename=course_data.csv'
    writer=csv.writer(resp)
    writer.writerow(['Course Code','Course Name','Course Credits'])
    for c in courses:
        writer.writerow([c.courseCode,c.courseName,c.courseCredits])
    return resp

from reportlab.lib.pagesizes import letter
from reportlab.platypus import SimpleDocTemplate, Table
def generatePDF(request):
    courses=course.objects.all()
    resp=HttpResponse(content_type="text/pdf")
    resp['Content-Disposition']='attachment; filename=course_data.pdf'
    pdf=SimpleDocTemplate(resp,pagesize=letter)
```

```
    table_data=[['Course Code','Course Name','Course Credits']]
    for c in courses:
        table_data.append([c.courseCode,c.courseName,str(c.courseCredits)])
    table=Table(table_data)
    pdf.build([table])
    return resp
```

urls.py

```
from django.contrib import admin
from django.urls import path
from studCourseRegApp.views import enrolledStudentsUsingAjax, generateCSV, home,
registerAjax,
studentlist,courselist,register,enrolledStudents,add_project,StudentListView,StudentDetailVie
w,generatePDF
urlpatterns = [
    path('secretadmin/', admin.site.urls),
    path('',home),
    path('home/',home),
    path('studentlist/',studentlist),
    path('courselist/',courselist),
    path('register/',register),
    path('enrolledlist/',enrolledStudents),
    path('addproject/',add_project),
    path('genericlistviewstudent/',StudentListView.as_view()),
    path('genericdetailedviewstudent/<int:pk>/',StudentDetailView.as_view()),
    path('download_course_table_as_csv/',generateCSV),
    path('download_course_table_as_pdf/',generatePDF),
    path('courseRegUsingAjax/',registerAjax),


]
```

settings.py(only one change inside installed apps add studCourseRegApp)

```
# Application definition
INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'studCourseRegApp',
]
```

OUTPUT


STUDENT COURSE REGISTRATION PORTAL
HOME
STUDENT LIST
COURSE LIST
REGISTER
ENROLLED LIST
ADD PROJECT
GENERIC STUDENT LIST VIEW
DOWNLOAD COURSE AS CSV
DOWNLOAD COURSE AS PDF
COURSE REG USING AJAX CALL
COURSE SEARCH USING AJAX
Student Name 1BI22CS007
Course Name 21CS61
Student enrolled successfully
Enroll
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5.2 . Develop a search application in Django using AJAX that displays courses enrolled by a student being searched.

basicTemplate.html

```
<!DOCTYPE html>
<html>
   <head>
      <style>
         nav{background-color: lightblue;padding: 15px;  }
         nav a {
   color: #fff; /* Text color */
   text-decoration: none; /* Remove underline */
   padding: 10px 20px; /* Padding around each link */
   margin: 0px 10px; /* Spacing between links */
   border-radius: 5px; /* Rounded corners */
   background-color: #555;
   flex-wrap: wrap;

}

nav a:hover {
   background-color:aqua;/* Background color on hover */
}
ul {
         list-style: none;
         margin: 0;
         padding: 0;
         display: flex; /* Use flexbox */
         flex-wrap: wrap; /* Allow items to wrap to the next line */
         flex-direction: row; /* Display items in a column */
      }
      li {
         margin-right: 20px;
         margin-bottom: 25px;
```

```
    }

    </style>
    <title>
      {% block title %} {% endblock %}
    </title>
  </head>

  <body>
    <center> <h1 style="background-color: blue;color:yellow"> STUDENT COURSE REGISTRATION PORTAL</h1></center>
    <nav>
            <ul>
      <li>  <a href="/home/">HOME</a></li>
       <li> <a href="/studentlist/">STUDENT LIST</a></li>
      <li>  <a href="/courselist/">COURSE LIST</a> </li>
       <li> <a href="/register/">REGISTER</a></li>
      <li>  <a href="/enrolledlist/">ENROLLED LIST</a></li>
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    </nav>
    <section>
     {% block content %} {% endblock %}
  </section>
  <footer>
    <hr/>
    <center>
      &copy; Designed and Developeb by Dr. Harish Kumar B T, Dept. of CSE, BIT, Bangalore-04
```

```
        </center>
    </footer>

    </body>
</html>
```

models.py

```
from django.db import models
from django.forms import ModelForm

# Create your models here.

class course(models.Model):
    courseCode=models.CharField(max_length=10)
    courseName=models.CharField(max_length=50)
    courseCredits=models.IntegerField()

    def __str__(self):
        return self.courseCode+" "+self.courseName+" "+str(self.courseCredits)


class student(models.Model):
    usn=models.CharField(max_length=10)
    name=models.CharField(max_length=40)
    sem=models.IntegerField()
    courses=models.ManyToManyField(course,related_name='student_set')
    def __str__(self):
        return self.usn+" "+self.name+" "+str(self.sem)

class projectReg(models.Model):
    student=models.ForeignKey(student,on_delete=models.CASCADE)
    ptitle=models.CharField(max_length=30)
    planguage=models.CharField(max_length=30)
    pduration=models.IntegerField()
```

```
class projectForm(ModelForm):
    required_css_class="required"
    class Meta:
        model=projectReg
        fields=['student','ptitle','planguage','pduration']
```

After writing models.py run the below commands in VS code terminal.

python manage.py makemigrations

python manage.py migrate

views.py

```
from django.http import HttpResponse
from django.shortcuts import render
from studCourseRegApp.models import student,course, projectForm

# Create your views here.
def home(request):
    return render(request,'home.html')

def studentlist(request):
    s=student.objects.all()
    return render(request,'studentlist.html',{'student_list':s})

def courselist(request):
    c=course.objects.all()
    return render(request,'courselist.html',{'course_list':c})

def register(request):
    if request.method=="POST":
        sid=request.POST.get("student")
        cid=request.POST.get("course")
        studentobj=student.objects.get(id=sid)
        courseobj=course.objects.get(id=cid)
```

```
        res=studentobj.courses.filter(id=cid)
        if res:
            resp="<h1>Student with usn %s has already enrolled for the
%s<h1>"%(studentobj.usn,courseobj.courseCode)
            return HttpResponse(resp)
        studentobj.courses.add(courseobj)
        resp="<h1>student with usn %s successfully enrolled for the course with sub code
%s</h1>"%(studentobj.usn,courseobj.courseCode)
        return HttpResponse(resp)
    else:
        studentlist=student.objects.all()
        courselist=course.objects.all()
        return render(request,'register.html',{'student_list':studentlist,'course_list':courselist})

def enrolledStudents(request):
    if request.method=="POST":
        cid=request.POST.get("course")
        courseobj=course.objects.get(id=cid)
        studentlistobj=courseobj.student_set.all()
        return render(request,'enrolledlist.html',{'course':courseobj,'student_list':studentlistobj})

    else:
        courselist=course.objects.all()
        return render(request,'enrolledlist.html',{'Course_List':courselist})



def add_project(request):
    if request.method=="POST":
        form=projectForm(request.POST)
        if form.is_valid():
            form.save()
            return HttpResponse("<h1>Project Data Successfully saved</h1>")
        else:
```

```
            return HttpResponse("<h1>Project details not saved</h1>")
    else:
        form=projectForm()
        return render(request, "projectReg.html",{'form':form})



from django.views import generic
class StudentListView(generic.ListView):
    model=student
    template_name="GenericListViewStudent.html"

class StudentDetailView(generic.DetailView):
    model=student
    template_name="GenericDetailedViewStudent.html"

import csv
def generateCSV(request):
    courses=course.objects.all()
    resp=HttpResponse(content_type="text/csv")
    resp['Content-Disposition']='attachment; filename=course_data.csv'
    writer=csv.writer(resp)
    writer.writerow(['Course Code','Course Name','Course Credits'])
    for c in courses:
        writer.writerow([c.courseCode,c.courseName,c.courseCredits])
    return resp

from reportlab.lib.pagesizes import letter
from reportlab.platypus import SimpleDocTemplate, Table
def generatePDF(request):
    courses=course.objects.all()
    resp=HttpResponse(content_type="text/pdf")
    resp['Content-Disposition']='attachment; filename=course_data.pdf'
    pdf=SimpleDocTemplate(resp,pagesize=letter)
```

```
    table_data=[['Course Code','Course Name','Course Credits']]
    for c in courses:
        table_data.append([c.courseCode,c.courseName,str(c.courseCredits)])
    table=Table(table_data)
    pdf.build([table])
    return resp
```

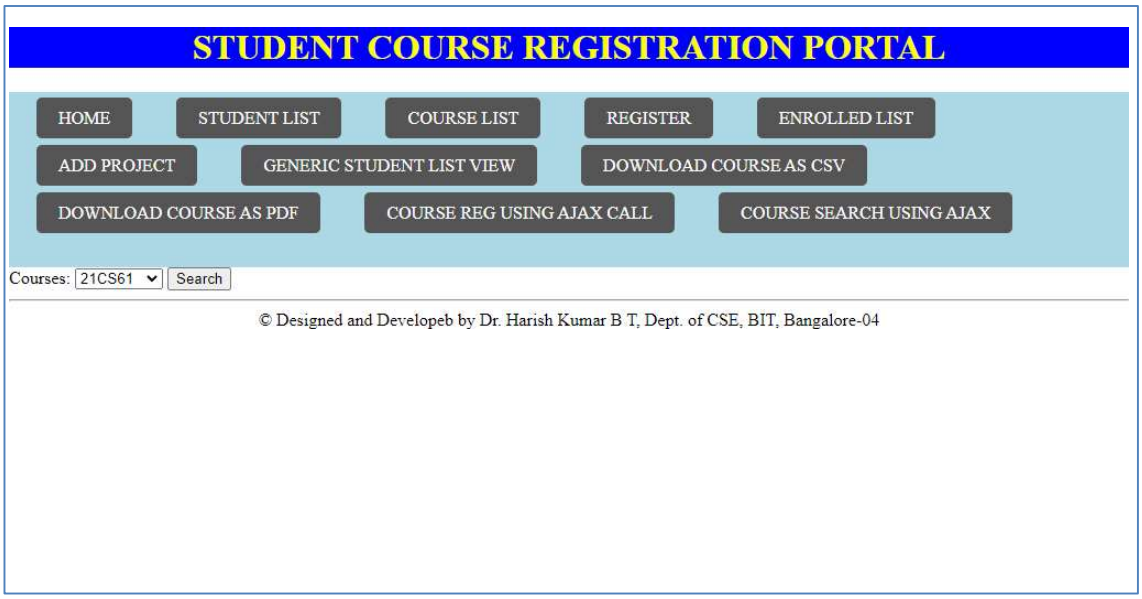
urls.py

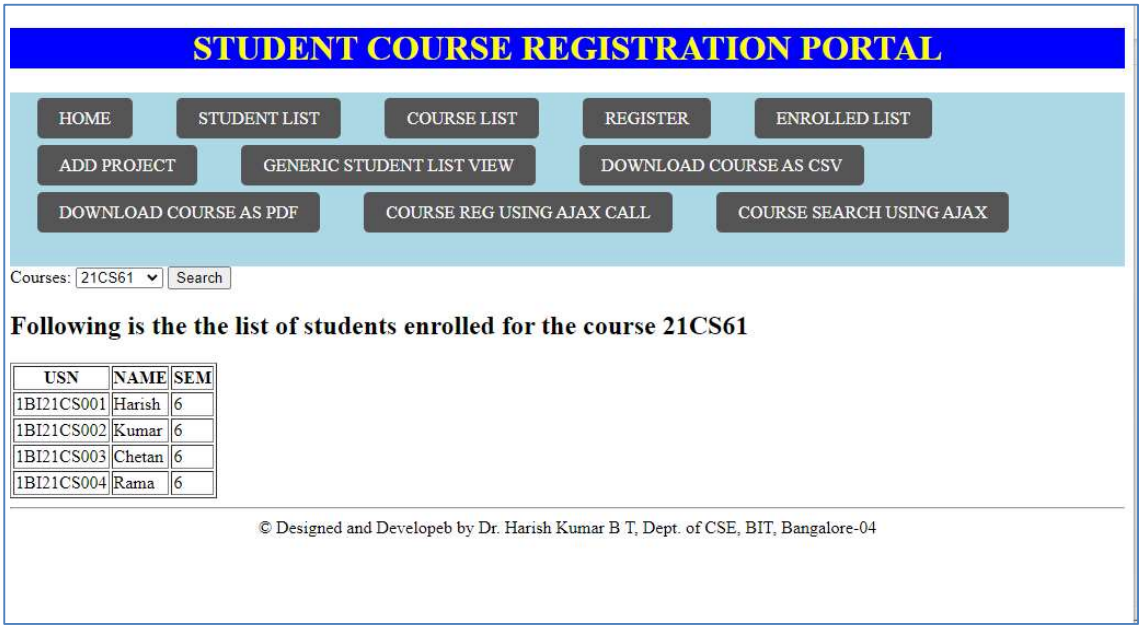
```
from django.contrib import admin
from django.urls import path
from studCourseRegApp.views import enrolledStudentsUsingAjax, generateCSV, home,
registerAjax,
studentlist,courselist,register,enrolledStudents,add_project,StudentListView,StudentDetailVie
w,generatePDF
urlpatterns = [
    path('secretadmin/', admin.site.urls),
    path('',home),
    path('home/',home),
    path('studentlist/',studentlist),
    path('courselist/',courselist),
    path('register/',register),
    path('enrolledlist/',enrolledStudents),
    path('addproject/',add_project),
    path('genericlistviewstudent/',StudentListView.as_view()),
    path('genericdetailedviewstudent/<int:pk>/',StudentDetailView.as_view()),
    path('download_course_table_as_csv/',generateCSV),
    path('download_course_table_as_pdf/',generatePDF),
    path('courseRegUsingAjax/',registerAjax),
    path('course_search_ajax/',enrolledStudentsUsingAjax),

]
```

settings.py(only one change inside installed apps add studCourseRegApp)

```
# Application definition

INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'studCourseRegApp',
]
```

OUTPUT




STUDENT COURSE REGISTRATION PORTAL
HOME
STUDENT LIST
COURSE LIST
REGISTER
ENROLLED LIST
ADD PROJECT
GENERIC STUDENT LIST VIEW
DOWNLOAD COURSE AS CSV
DOWNLOAD COURSE AS PDF
COURSE REG USING AJAX CALL
COURSE SEARCH USING AJAX
Courses: 21CS61
Search
Following is the the list of students enrolled for the course 21CS61
USN NAME SEM
1BI21CS001 Harish 6
1BI21CS002 Kumar 6
1BI21CS003 Chetan 6
1BI21CS004 Rama 6
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