CLOUD COMPUTING - PROJECT

DOCKERIZING DJANGO APP:

PROJECT DESCRIPTION:

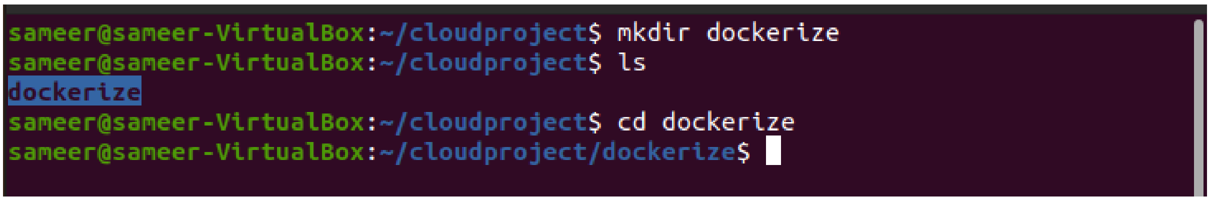
This project shows how to run a simple Django/PostgreSQL app via docker compose.

The application shows a simple Django admin interface in which you can login and add or remove user along with increasing or decreasing their privileges or permissions or rights.

PROJECT PROCESS:

STEP - 01:

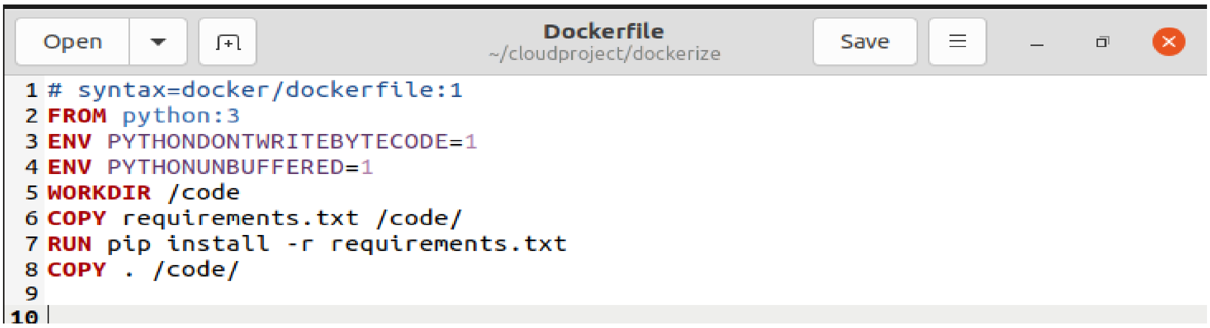
Create an empty project directory and navigate to that directory.



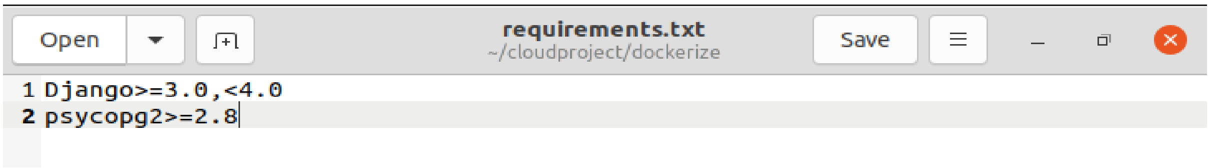
```
sameer@sameer-VirtualBox:~/cloudproject$ mkdir dockerize
sameer@sameer-VirtualBox:~/cloudproject$ ls
dockerize
sameer@sameer-VirtualBox:~/cloudproject$ cd dockerize
sameer@sameer-VirtualBox:~/cloudproject/dockerize$ 
```

STEP - 02:

Create a Dockerfile and requirements.txt.



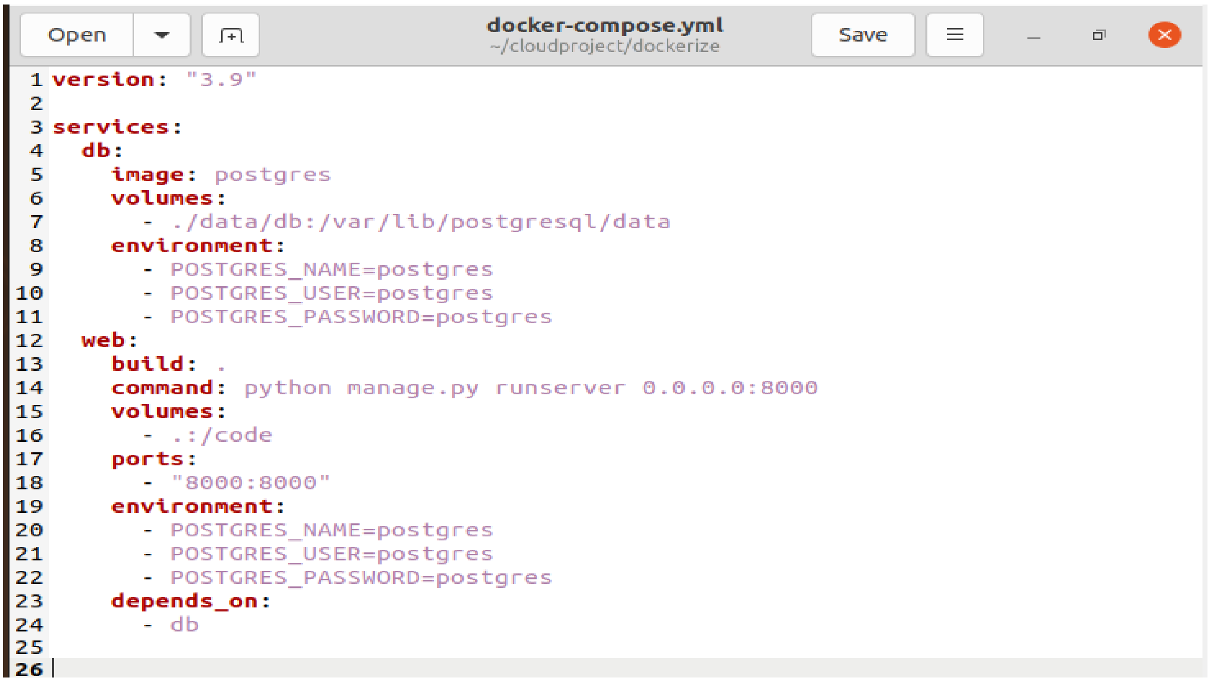
```
# syntax=docker/dockerfile:1
FROM python:3
ENV PYTHONDONTWRITEBYTECODE=1
ENV PYTHONUNBUFFERED=1
WORKDIR /code
COPY requirements.txt /code/
RUN pip install -r requirements.txt
COPY . /code/


```



```
Django>=3.0,<4.0
psycopg2>=2.8
```

STEP - 03:

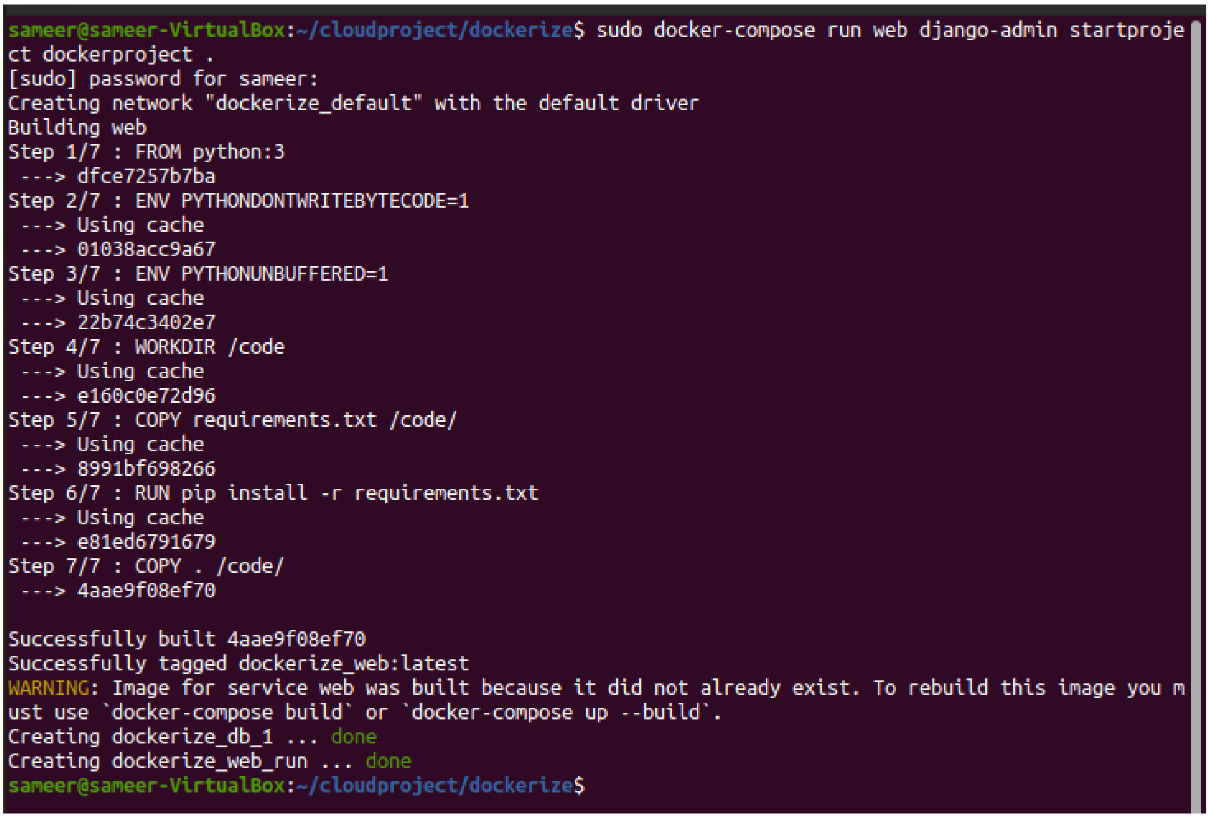
Create docker-compose.yml file.



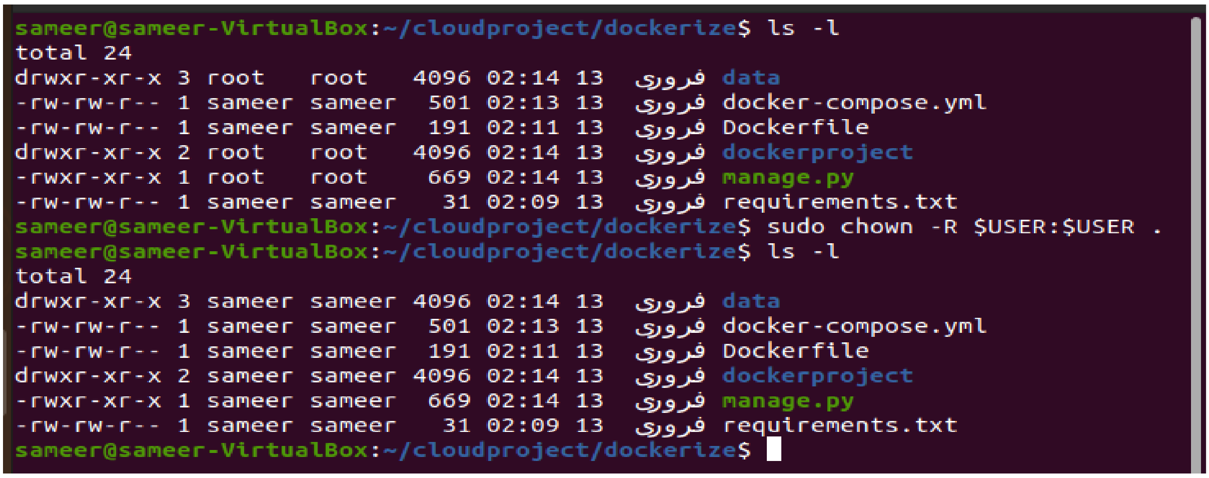
```yaml
version: "3.9"

services:
  db:
    image: postgres
    volumes:
      - ./data/db:/var/lib/postgresql/data
    environment:
      - POSTGRES_NAME=postgres
      - POSTGRES_USER=postgres
      - POSTGRES_PASSWORD=postgres
  web:
    build: .
    command: python manage.py runserver 0.0.0.0:8000
    volumes:
      - .:/code
    ports:
      - "8000:8000"
    environment:
      - POSTGRES_NAME=postgres
      - POSTGRES_USER=postgres
      - POSTGRES_PASSWORD=postgres
    depends_on:
      - db


```

STEP - 04:

Create Django project and modify file permissions.



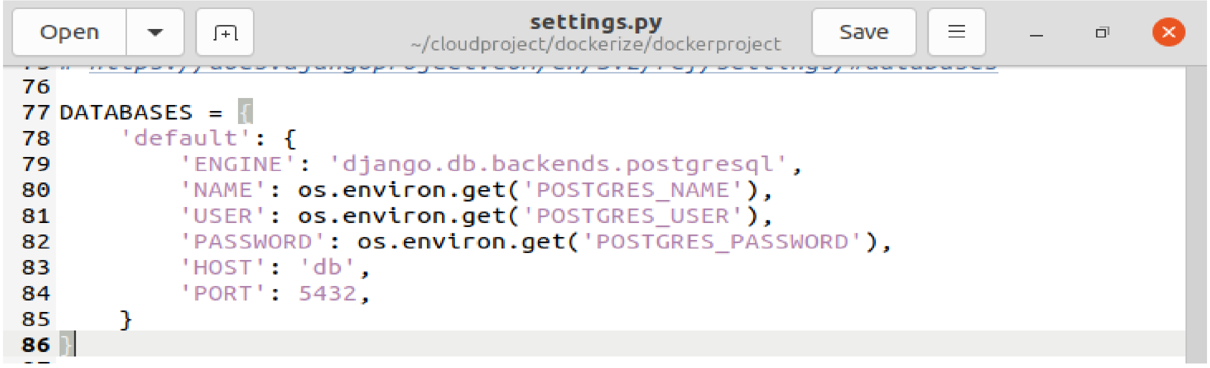
```
sameer@sameer-VirtualBox:~/cloudproject/dockerize$ sudo docker-compose run web django-admin startproje
ct dockerproject .
[sudo] password for sameer:
Creating network "dockerize_default" with the default driver
Building web
Step 1/7 : FROM python:3
 ---> dfce7257b7ba
Step 2/7 : ENV PYTHONDONTWRITEBYTECODE=1
 ---> Using cache
 ---> 01038acc9a67
Step 3/7 : ENV PYTHONUNBUFFERED=1
 ---> Using cache
 ---> 22b74c3402e7
Step 4/7 : WORKDIR /code
 ---> Using cache
 ---> e160c0e72d96
Step 5/7 : COPY requirements.txt /code/
 ---> Using cache
 ---> 8991bf698266
Step 6/7 : RUN pip install -r requirements.txt
 ---> Using cache
 ---> e81ed6791679
Step 7/7 : COPY . /code/
 ---> 4aae9f08ef70

Successfully built 4aae9f08ef70
Successfully tagged dockerize_web:latest
WARNING: Image for service web was built because it did not already exist. To rebuild this image you m
ust use `docker-compose build` or `docker-compose up --build`.
Creating dockerize_db_1 ... done
Creating dockerize_web_run ... done
sameer@sameer-VirtualBox:~/cloudproject/dockerize$
```



```
sameer@sameer-VirtualBox:~/cloudproject/dockerize$ ls -l
total 24
drwxr-xr-x 3 root   root   4096 02:14 13  فروری data
-rw-rw-r-- 1 sameer sameer  501 02:13 13  فروری docker-compose.yml
-rw-rw-r-- 1 sameer sameer  191 02:11 13  فروری Dockerfile
drwxr-xr-x 2 root   root   4096 02:14 13  فروری dockerproject
-rwxr-xr-x 1 root   root    669 02:14 13  فروری manage.py
-rw-rw-r-- 1 sameer sameer   31 02:09 13  فروری requirements.txt
sameer@sameer-VirtualBox:~/cloudproject/dockerize$ sudo chown -R $USER:$USER .
sameer@sameer-VirtualBox:~/cloudproject/dockerize$ ls -l
total 24
drwxr-xr-x 3 sameer sameer 4096 02:14 13  فروری data
-rw-rw-r-- 1 sameer sameer  501 02:13 13  فروری docker-compose.yml
-rw-rw-r-- 1 sameer sameer  191 02:11 13  فروری Dockerfile
drwxr-xr-x 2 sameer sameer 4096 02:14 13  فروری dockerproject
-rwxr-xr-x 1 sameer sameer  669 02:14 13  فروری manage.py
-rw-rw-r-- 1 sameer sameer   31 02:09 13  فروری requirements.txt
sameer@sameer-VirtualBox:~/cloudproject/dockerize$
```

STEP - 05:

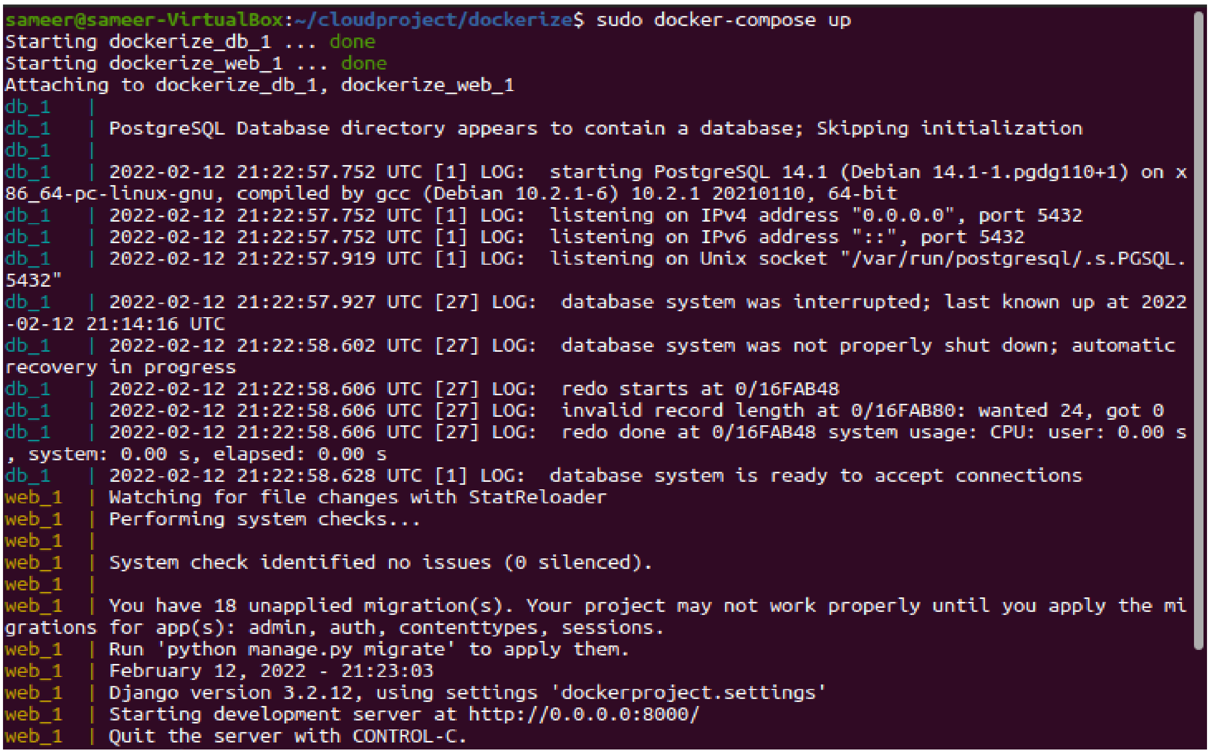
Connect Database to the project (go to settings.py and modify the database code).



```

DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.postgresql',
        'NAME': os.environ.get('POSTGRES_NAME'),
        'USER': os.environ.get('POSTGRES_USER'),
        'PASSWORD': os.environ.get('POSTGRES_PASSWORD'),
        'HOST': 'db',
        'PORT': 5432,
    }
}
```

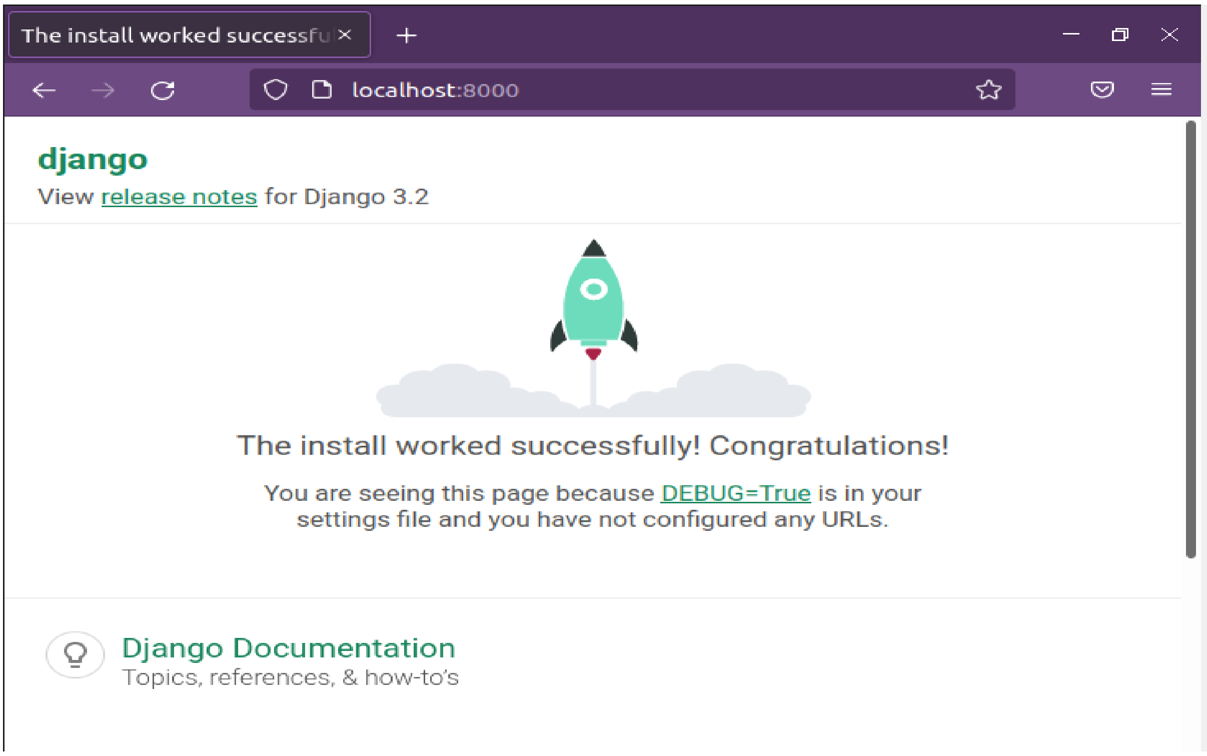
STEP - 06:

Run ‘docker-compose up’ to run the project.



```
sameer@sameer-VirtualBox:~/cloudproject/dockerize$ sudo docker-compose up
Starting dockerize_db_1 ... done
Starting dockerize_web_1 ... done
Attaching to dockerize_db_1, dockerize_web_1
db_1   |
db_1   | PostgreSQL Database directory appears to contain a database; Skipping initialization
db_1   |
db_1   | 2022-02-12 21:22:57.752 UTC [1] LOG:  starting PostgreSQL 14.1 (Debian 14.1-1.pgdg110+1) on x
86_64-pc-linux-gnu, compiled by gcc (Debian 10.2.1-6) 10.2.1 20210110, 64-bit
db_1   | 2022-02-12 21:22:57.752 UTC [1] LOG:  listening on IPv4 address "0.0.0.0", port 5432
db_1   | 2022-02-12 21:22:57.752 UTC [1] LOG:  listening on IPv6 address "::", port 5432
db_1   | 2022-02-12 21:22:57.919 UTC [1] LOG:  listening on Unix socket "/var/run/postgresql/.s.PGSQL.
5432"
db_1   | 2022-02-12 21:22:57.927 UTC [27] LOG:  database system was interrupted; last known up at 2022
-02-12 21:14:16 UTC
db_1   | 2022-02-12 21:22:58.602 UTC [27] LOG:  database system was not properly shut down; automatic
recovery in progress
db_1   | 2022-02-12 21:22:58.606 UTC [27] LOG:  redo starts at 0/16FAB48
db_1   | 2022-02-12 21:22:58.606 UTC [27] LOG:  invalid record length at 0/16FAB80: wanted 24, got 0
db_1   | 2022-02-12 21:22:58.606 UTC [27] LOG:  redo done at 0/16FAB48 system usage: CPU: user: 0.00 s
, system: 0.00 s, elapsed: 0.00 s
db_1   | 2022-02-12 21:22:58.628 UTC [1] LOG:  database system is ready to accept connections
web_1  | Watching for file changes with StatReloader
web_1  | Performing system checks...
web_1  |
web_1  | System check identified no issues (0 silenced).
web_1  |
web_1  | You have 18 unapplied migration(s). Your project may not work properly until you apply the mi
grations for app(s): admin, auth, contenttypes, sessions.
web_1  | Run 'python manage.py migrate' to apply them.
web_1  | February 12, 2022 - 21:23:03
web_1  | Django version 3.2.12, using settings 'dockerproject.settings'
web_1  | Starting development server at http://0.0.0.0:8000/
web_1  | Quit the server with CONTROL-C.
```

Project running at localhost:8000 (output as follows).

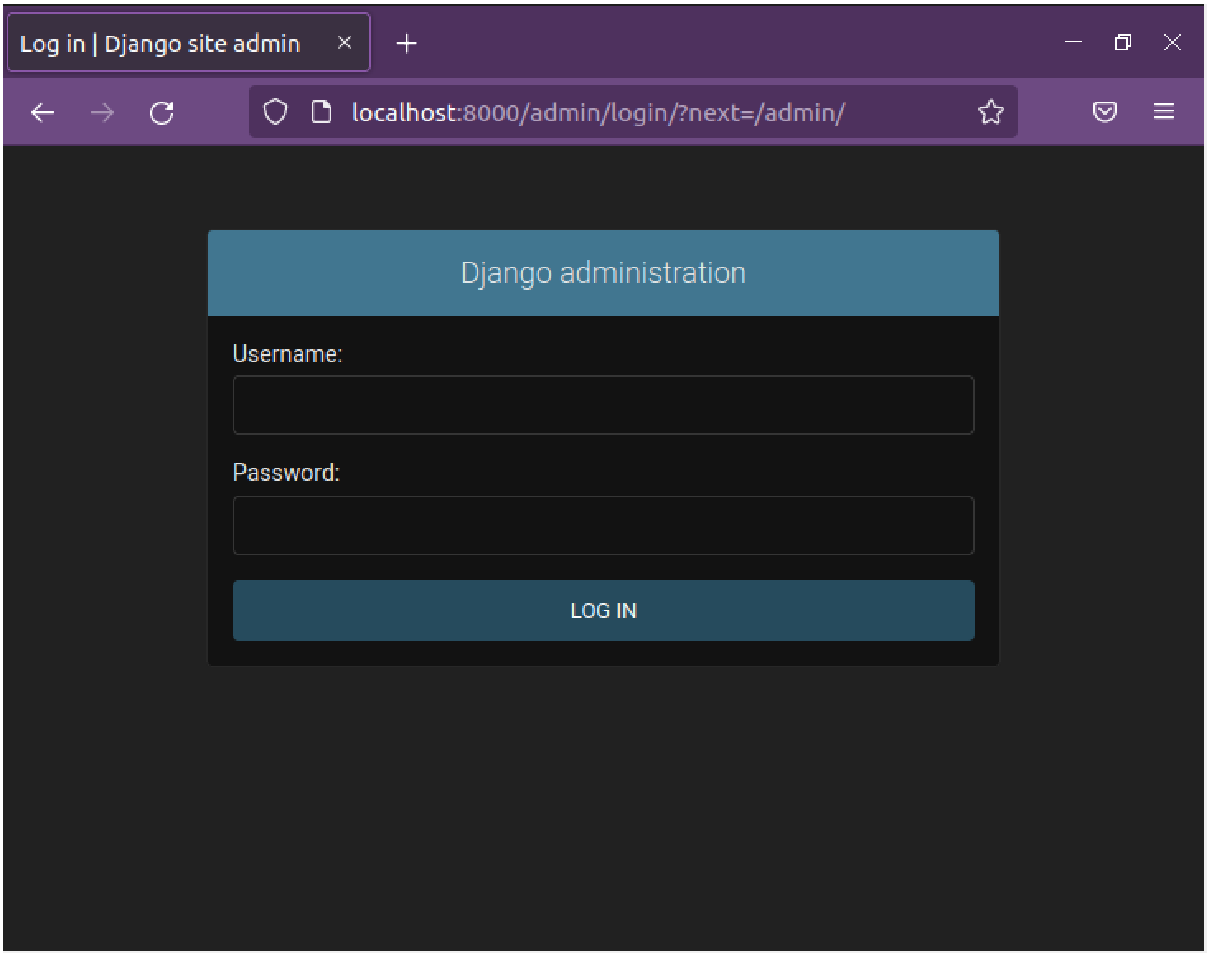


django
View release notes for Django 3.2

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


Log in | Django site admin
localhost:8000/admin/login/?next=/admin/

Django administration

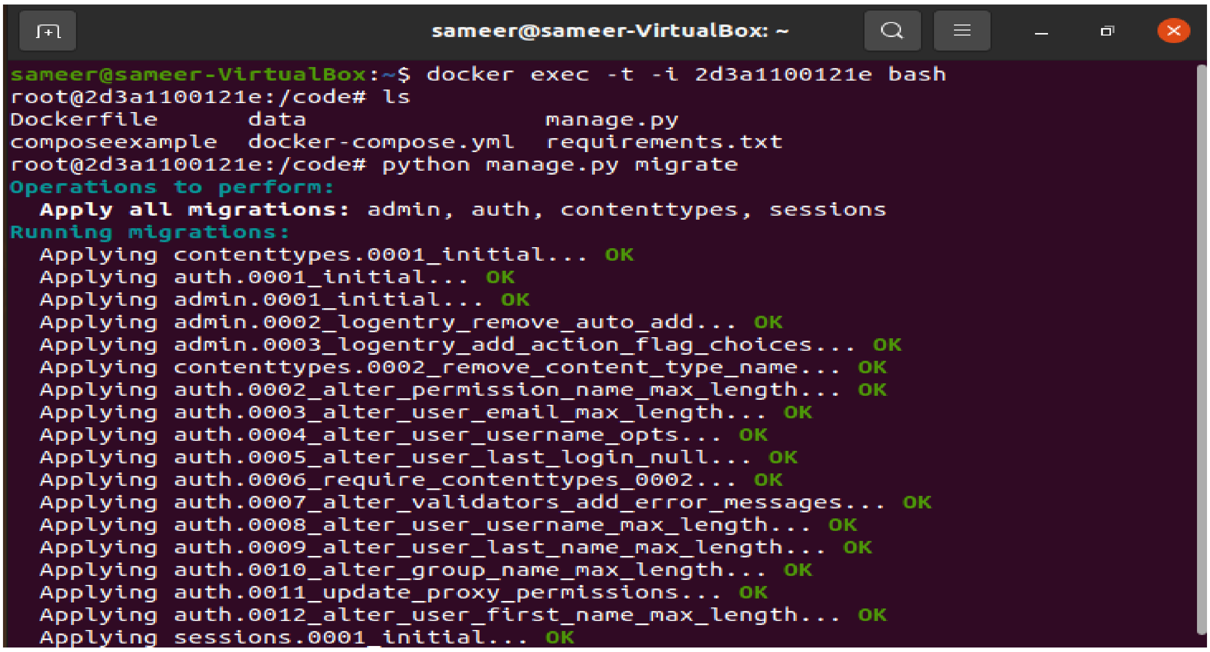
Username:

Password:

LOG IN

STEP - 07:

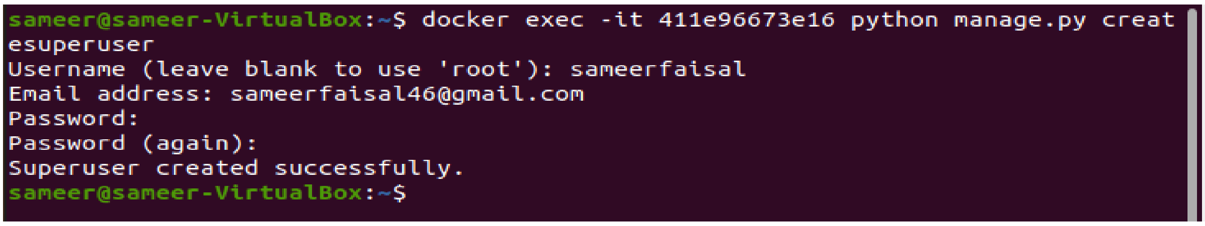
Apply migrations from project directory.



```
sameer@sameer-VirtualBox:~$ docker exec -t -i 2d3a1100121e bash
root@2d3a1100121e:/code# ls
Dockerfile       data                manage.py
composeexample   docker-compose.yml  requirements.txt
root@2d3a1100121e:/code# python manage.py migrate
Operations to perform:
  Apply all migrations: admin, auth, contenttypes, sessions
Running migrations:
  Applying contenttypes.0001_initial... OK
  Applying auth.0001_initial... OK
  Applying admin.0001_initial... OK
  Applying admin.0002_logentry_remove_auto_add... OK
  Applying admin.0003_logentry_add_action_flag_choices... OK
  Applying contenttypes.0002_remove_content_type_name... OK
  Applying auth.0002_alter_permission_name_max_length... OK
  Applying auth.0003_alter_user_email_max_length... OK
  Applying auth.0004_alter_user_username_opts... OK
  Applying auth.0005_alter_user_last_login_null... OK
  Applying auth.0006_require_contenttypes_0002... OK
  Applying auth.0007_alter_validators_add_error_messages... OK
  Applying auth.0008_alter_user_username_max_length... OK
  Applying auth.0009_alter_user_last_name_max_length... OK
  Applying auth.0010_alter_group_name_max_length... OK
  Applying auth.0011_update_proxy_permissions... OK
  Applying auth.0012_alter_user_first_name_max_length... OK
  Applying sessions.0001_initial... OK
```

STEP - 08:

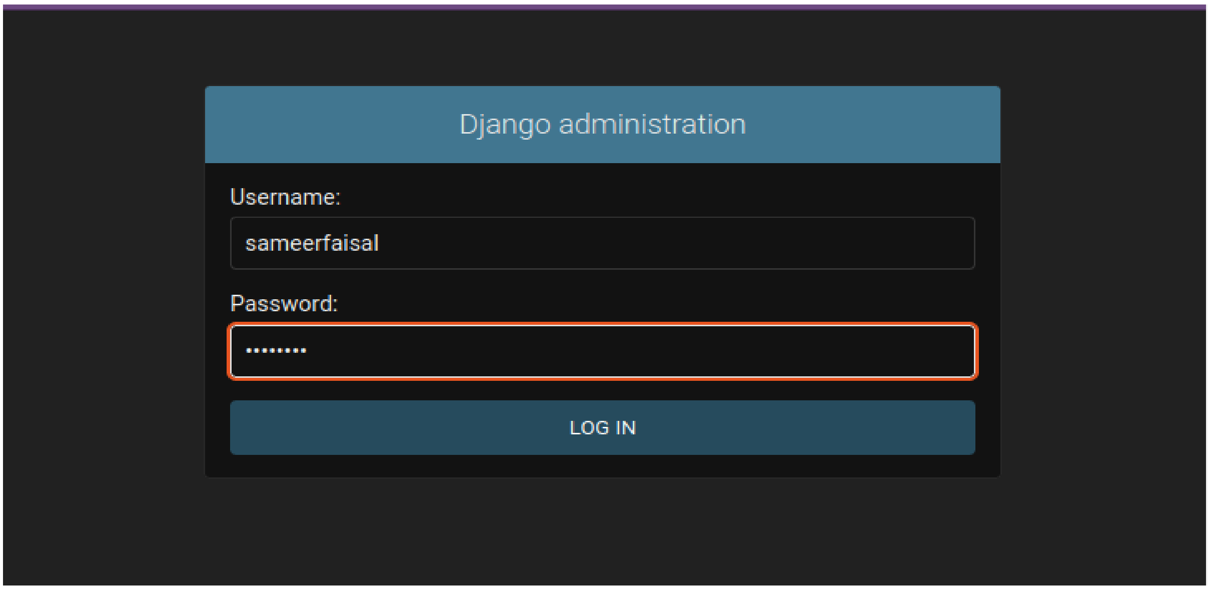
Create superuser to login to Django admin.



```
sameer@sameer-VirtualBox:~$ docker exec -it 411e96673e16 python manage.py creat
esuperuser
Username (leave blank to use 'root'): sameerfaisal
Email address: sameerfaisal46@gmail.com
Password:
Password (again):
Superuser created successfully.
sameer@sameer-VirtualBox:~$
```

STEP - 09:

Logging in as created superuser via Django admin.

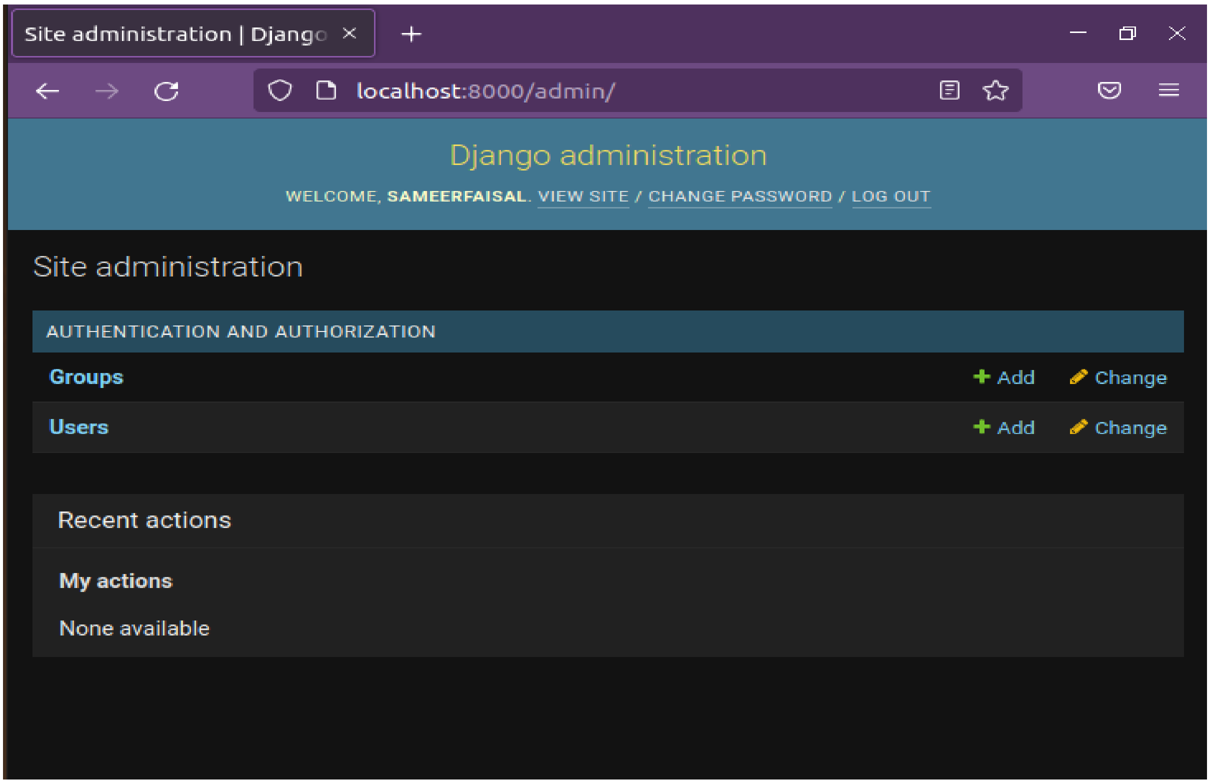


Django administration

Username: sameerfaisal

Password: ••••••••

Logged in as sameerfaisal (as shown below) having all permissions.



Site administration | Django

localhost:8000/admin/

Django administration

WELCOME, **SAMEERFAISAL**. VIEW SITE / CHANGE PASSWORD / LOG OUT

Site administration

AUTHENTICATION AND AUTHORIZATION

Groups	+ Add	Change
Users	+ Add	Change

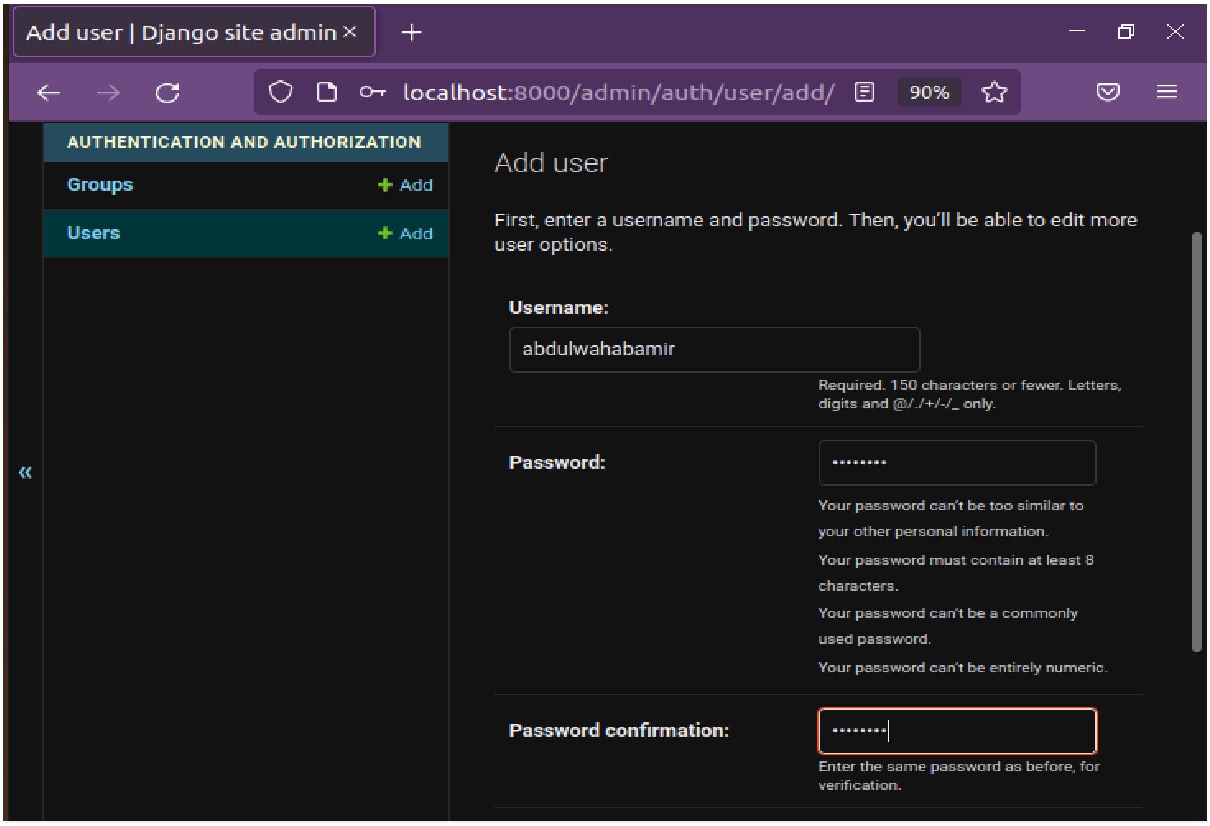
Recent actions

My actions

None available

STEP - 10:

Add another user (simple with no permissions) from Django admin.



Add user | Django site admin

localhost:8000/admin/auth/user/add/

AUTHENTICATION AND AUTHORIZATION

Groups	+ Add
Users	+ Add

Add user

First, enter a username and password. Then, you'll be able to edit more user options.

Username: abdulwahabamir

Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only.

Password: ••••••••

Your password can't be too similar to your other personal information.

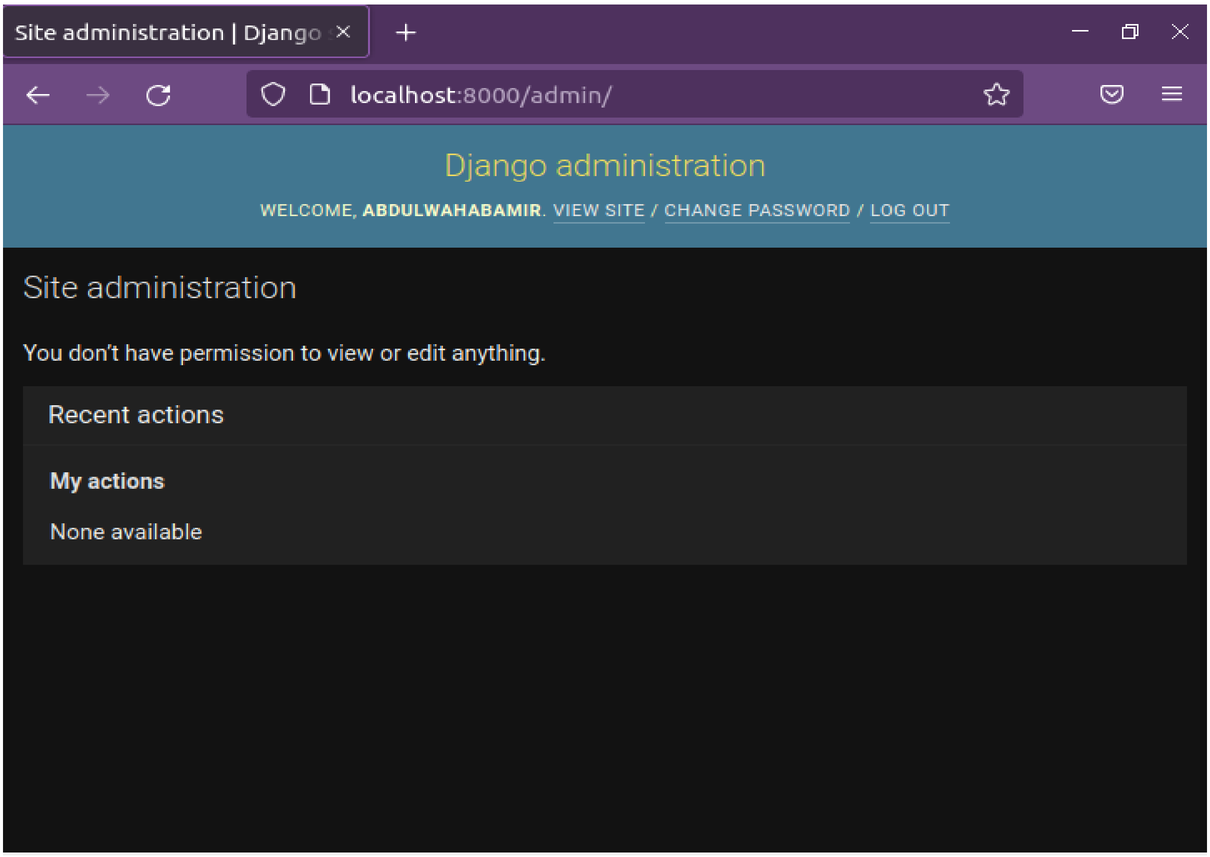
Your password must contain at least 8 characters.

Your password can't be a commonly used password.

Your password can't be entirely numeric.

Password confirmation: ••••••••

Enter the same password as before, for verification.



Django administration

WELCOME, **ABDULWAHABAMIR**. VIEW SITE / CHANGE PASSWORD / LOG OUT

Site administration

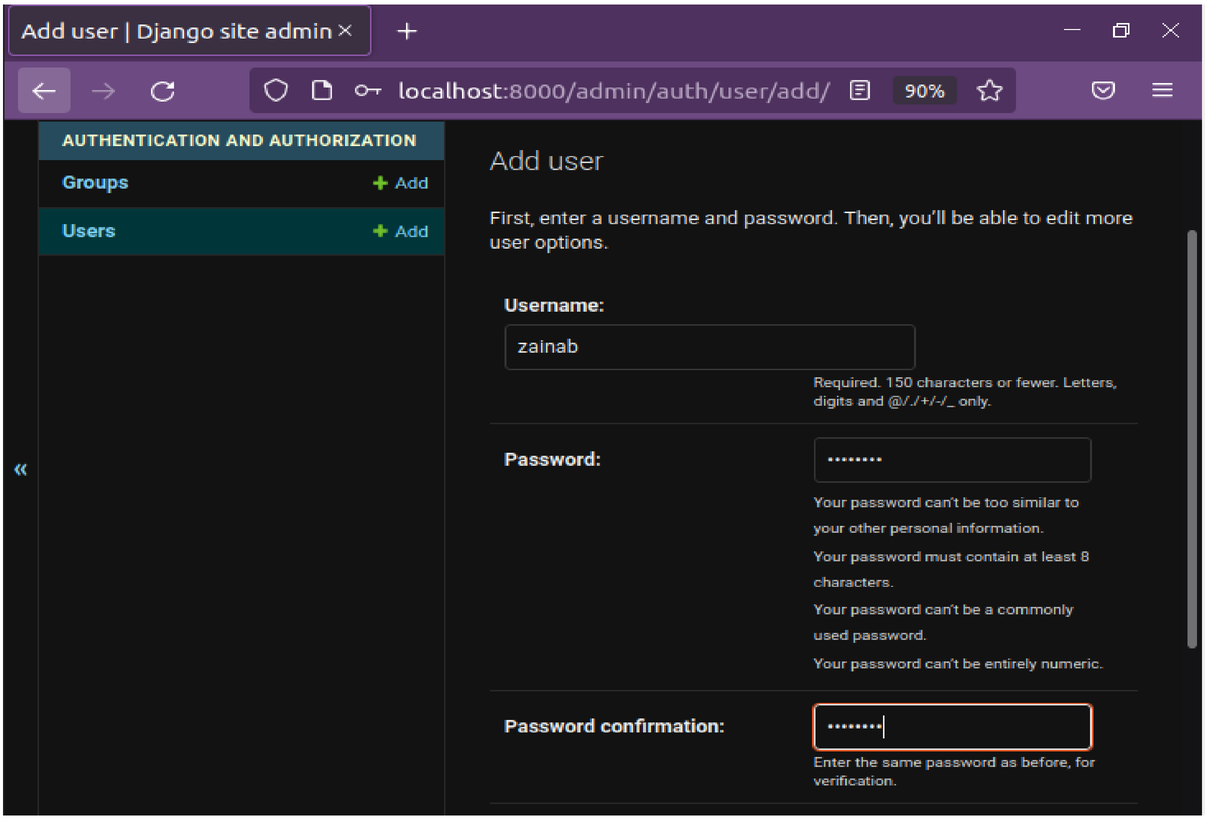
You don't have permission to view or edit anything.

Recent actions

My actions

None available

STEP - 11:
Add another user (another superuser with all permissions) from Django admin.



Add user | Django site admin ×
localhost:8000/admin/auth/user/add/
90%
AUTHENTICATION AND AUTHORIZATION
Groups
+ Add
Users
+ Add
«

Add user

First, enter a username and password. Then, you'll be able to edit more user options.

Username: zainab

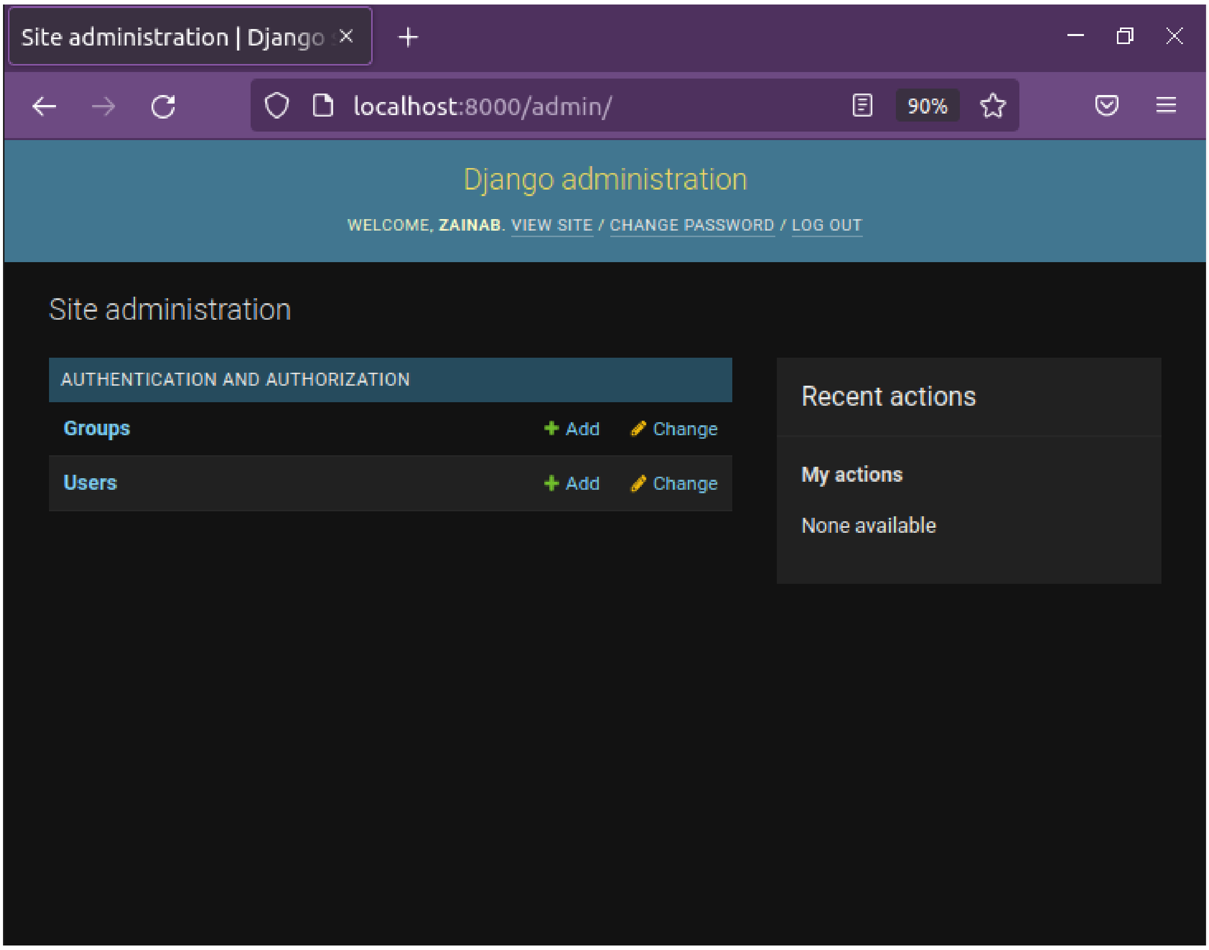
Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only.

Password: ••••••••

Your password can't be too similar to your other personal information.
Your password must contain at least 8 characters.
Your password can't be a commonly used password.
Your password can't be entirely numeric.

Password confirmation: ••••••••

Enter the same password as before, for verification.



Django administration

WELCOME, **ZAINAB**. VIEW SITE / CHANGE PASSWORD / LOG OUT

Site administration

AUTHENTICATION AND AUTHORIZATION

Groups	✚ Add	Change
Users	✚ Add	Change

Recent actions

My actions

None available