Documentation

Application Brief and **Technologies used**:

- I designed a web app that allows users to upload create an account and upload recipe
- Tools used:

i. Flask

ii. Python

iii. SQLAlchemy

iv. Jenkins

v. Docker

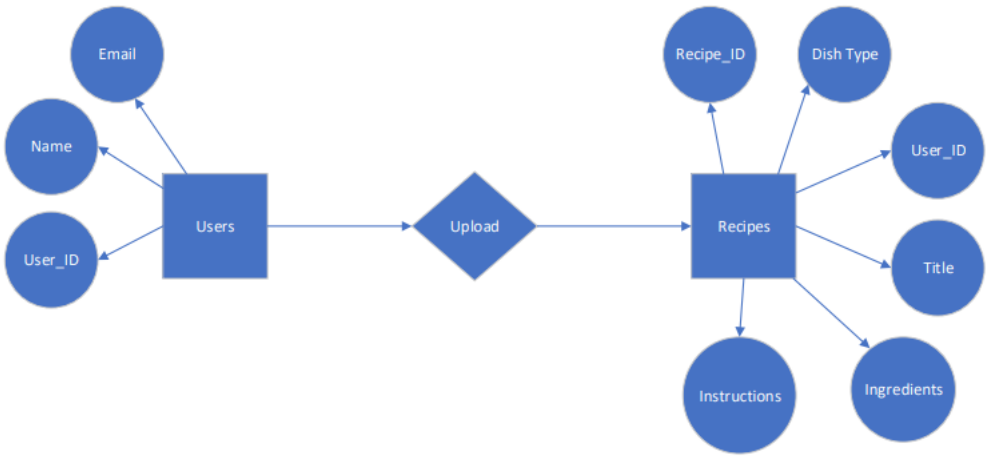
vi. Azure portal

vii. Jira

viii. Github

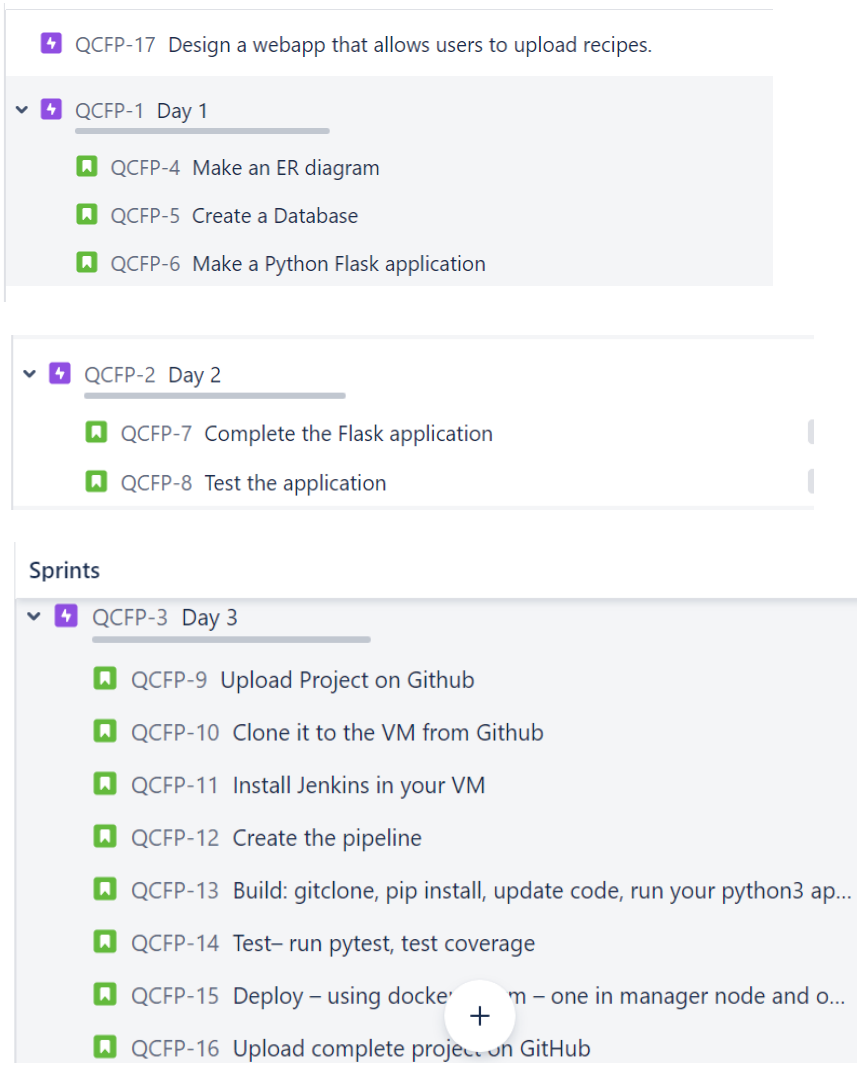
ER Diagram:

Firstly, I started by creating an ER diagram for my web application.



Jira:

Secondly, I used Jira to create an outline of my project.

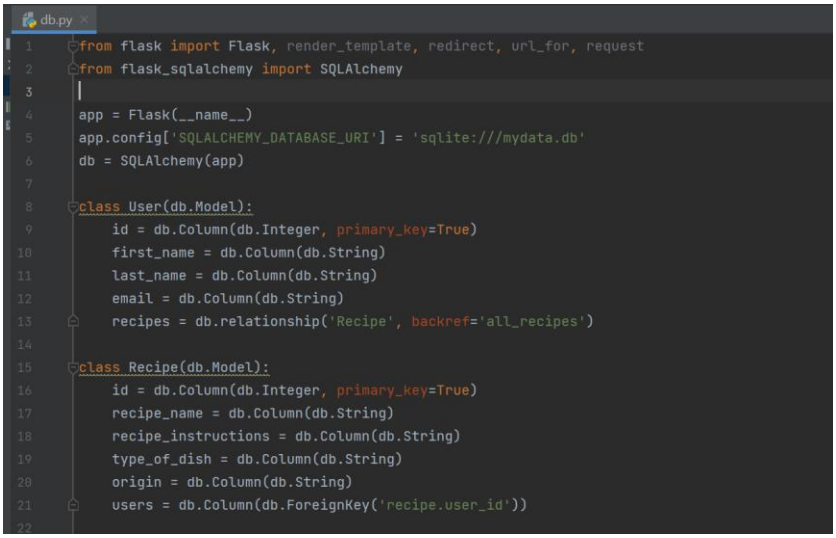


Database:

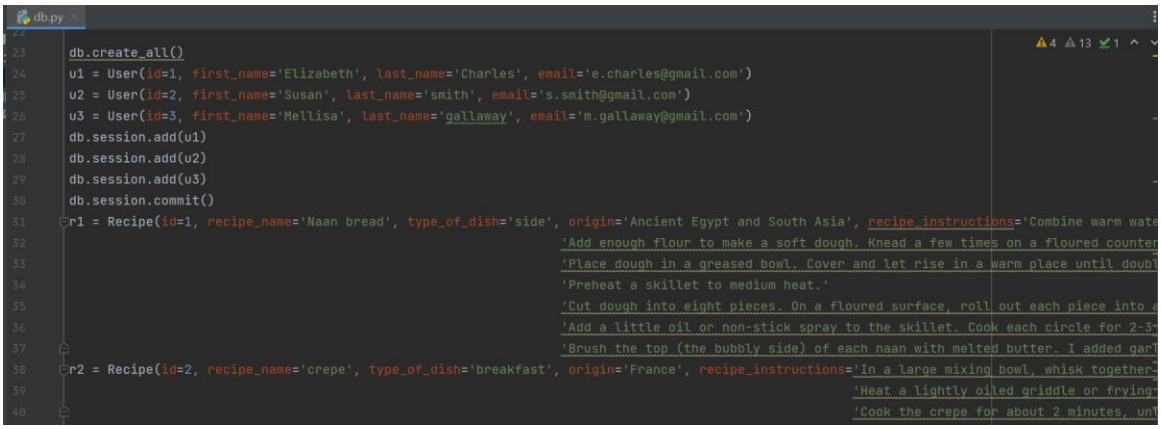
I then created a database on PyCharm using SQLite. Unfortunately, I was not able to get my database to work but I have inserted the completed database below. My database was supposed to produce two tables and shows a relationship between two entities.

- Entity one: Users

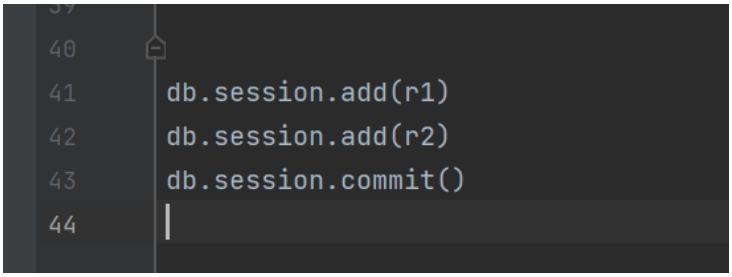
- Entity two: Recipe



```python
from flask import Flask, render_template, redirect, url_for, request
from flask_sqlalchemy import SQLAlchemy

app = Flask(__name__)
app.config['SQLALCHEMY_DATABASE_URI'] = 'sqlite:///mydata.db'
db = SQLAlchemy(app)

class User(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    first_name = db.Column(db.String)
    last_name = db.Column(db.String)
    email = db.Column(db.String)
    recipes = db.relationship('Recipe', backref='all_recipes')

class Recipe(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    recipe_name = db.Column(db.String)
    recipe_instructions = db.Column(db.String)
    type_of_dish = db.Column(db.String)
    origin = db.Column(db.String)
    users = db.Column(db.ForeignKey('recipe.user_id'))
```



```python
db.create_all()
u1 = User(id=1, first_name='Elizabeth', last_name='Charles', email='e.charles@gmail.com')
u2 = User(id=2, first_name='Susan', last_name='smith', email='s.smith@gmail.com')
u3 = User(id=3, first_name='Mellisa', last_name='gallaway', email='m.gallaway@gmail.com')
db.session.add(u1)
db.session.add(u2)
db.session.add(u3)
db.session.commit()
r1 = Recipe(id=1, recipe_name='Naan bread', type_of_dish='side', origin='Ancient Egypt and South Asia', recipe_instructions='Combine warm wate
                                                    'Add enough flour to make a soft dough. Knead a few times on a floured counter
                                                    'Place dough in a greased bowl. Cover and let rise in a warm place until doubl
                                                    'Preheat a skillet to medium heat.'
                                                    'Cut dough into eight pieces. On a floured surface, roll out each piece into a
                                                    'Add a little oil or non-stick spray to the skillet. Cook each circle for 2-3
                                                    'Brush the top (the bubbly side) of each naan with melted butter. I added garl
r2 = Recipe(id=2, recipe_name='crepe', type_of_dish='breakfast', origin='France', recipe_instructions='In a large mixing bowl, whisk together
                                                                                    'Heat a lightly oiled griddle or frying
                                                                                    'Cook the crepe for about 2 minutes, unt
```



```python
db.session.add(r1)
db.session.add(r2)
db.session.commit()
```

My Application:

My application is a web app that allows users to upload their recipes. They are able to create a user account and log in to their account.

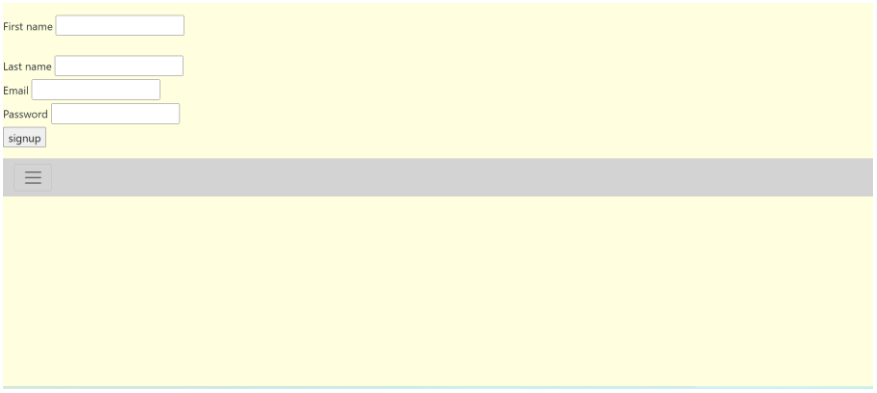
- Function One: Navigation bar directs users to routes (signup, login, logout, home)

- Function Two: User can sign up
- Function Three: User can log in

Website:

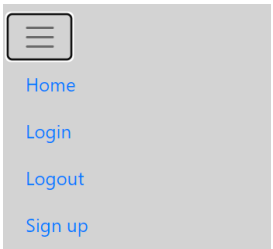
Home page:

Sign up:

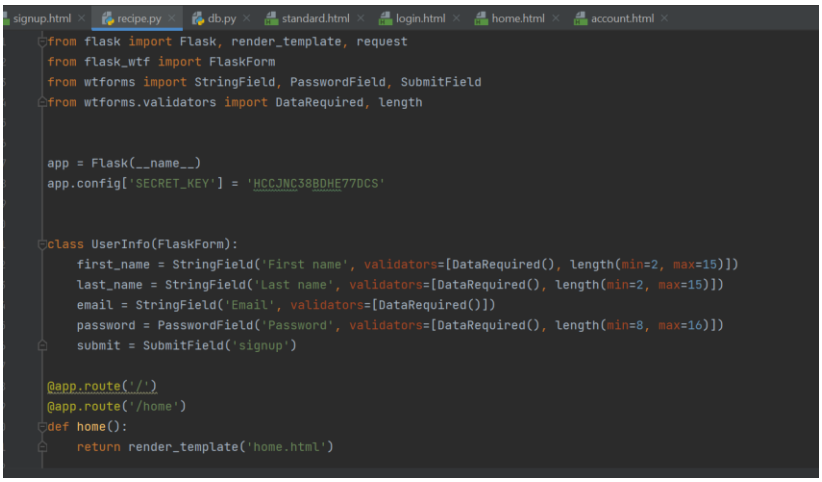


Log in:

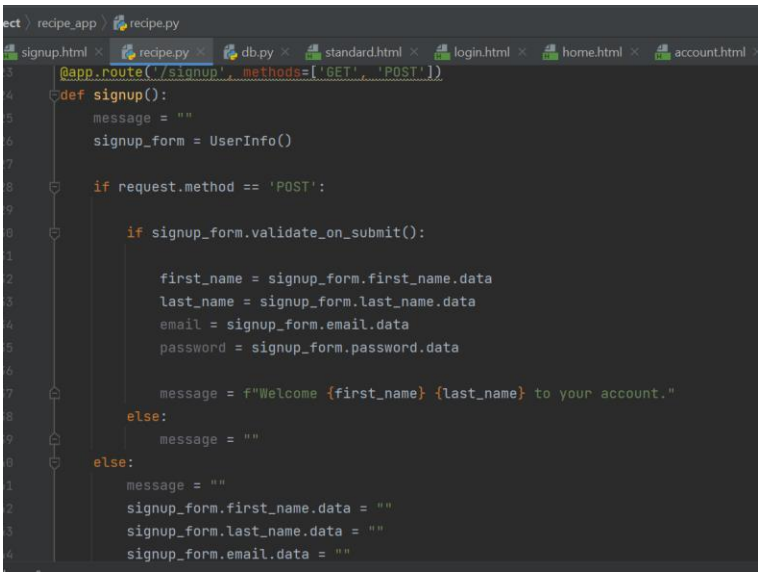
And the Logout button takes you back to the homepage.



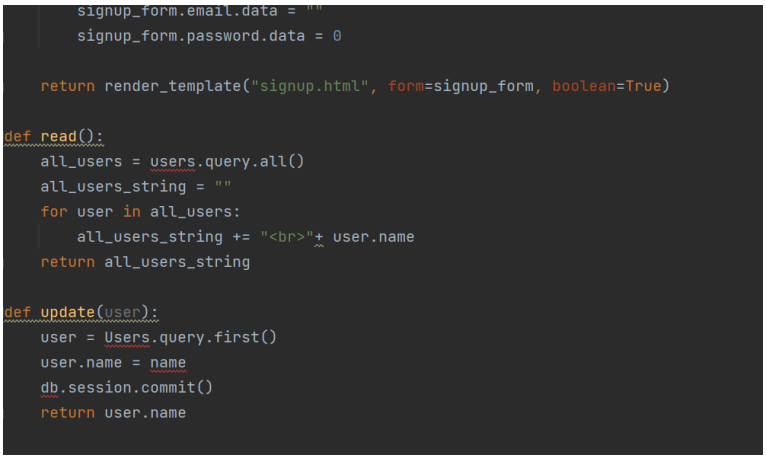
Code:



```
signup.html × recipe.py × db.py × standard.html × login.html × home.html × account.html ×
from flask import Flask, render_template, request
from flask_wtf import FlaskForm
from wtforms import StringField, PasswordField, SubmitField
from wtforms.validators import DataRequired, length


app = Flask(__name__)
app.config['SECRET_KEY'] = 'HCCJNC38BDHE77DCS'


class UserInfo(FlaskForm):
    first_name = StringField('First name', validators=[DataRequired(), length(min=2, max=15)])
    last_name = StringField('Last name', validators=[DataRequired(), length(min=2, max=15)])
    email = StringField('Email', validators=[DataRequired()])
    password = PasswordField('Password', validators=[DataRequired(), length(min=8, max=16)])
    submit = SubmitField('signup')

@app.route('/')
@app.route('/home')
def home():
    return render_template('home.html')
```

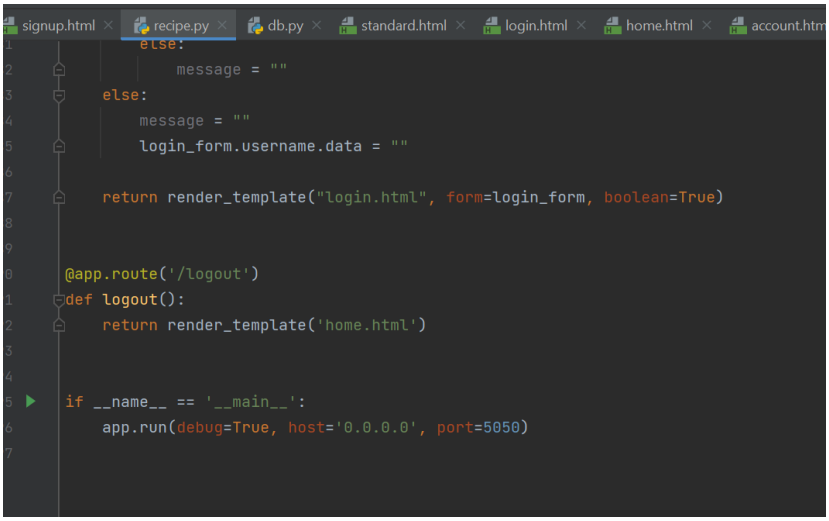


```
ect 〉 recipe_app 〉 recipe.py
signup.html × recipe.py × db.py × standard.html × login.html × home.html × account.html ×
@app.route('/signup', methods=['GET', 'POST'])
def signup():
    message = ""
    signup_form = UserInfo()

    if request.method == 'POST':

        if signup_form.validate_on_submit():

            first_name = signup_form.first_name.data
            last_name = signup_form.last_name.data
            email = signup_form.email.data
            password = signup_form.password.data

            message = f"Welcome {first_name} {last_name} to your account."
        else:
            message = ""
    else:
        message = ""
        signup_form.first_name.data = ""
        signup_form.last_name.data = ""
        signup_form.email.data = ""
```



```
        signup_form.email.data = ""
        signup_form.password.data = 0

    return render_template("signup.html", form=signup_form, boolean=True)

def read():
    all_users = users.query.all()
    all_users_string = ""
    for user in all_users:
        all_users_string += "<br>"+ user.name
    return all_users_string

def update(user):
    user = Users.query.first()
    user.name = name
    db.session.commit()
    return user.name
```

```python
class UserLogin(FlaskForm):
    username = StringField('Username', validators=[DataRequired(), length(min=2, max=15)])
    password = PasswordField('Password', validators=[DataRequired(), length(min=8, max=16)])
    submit = SubmitField('Login')

@app.route('/login', methods=['GET', 'POST'])
def login():
    message = ""
    login_form = UserLogin()

    if request.method == 'POST':

        if login_form.validate_on_submit():

            username = login_form.username.data
            password = login_form.password.data

            message = f"Welcome {username} to your account."
        else:
            message = ""
    else:
```

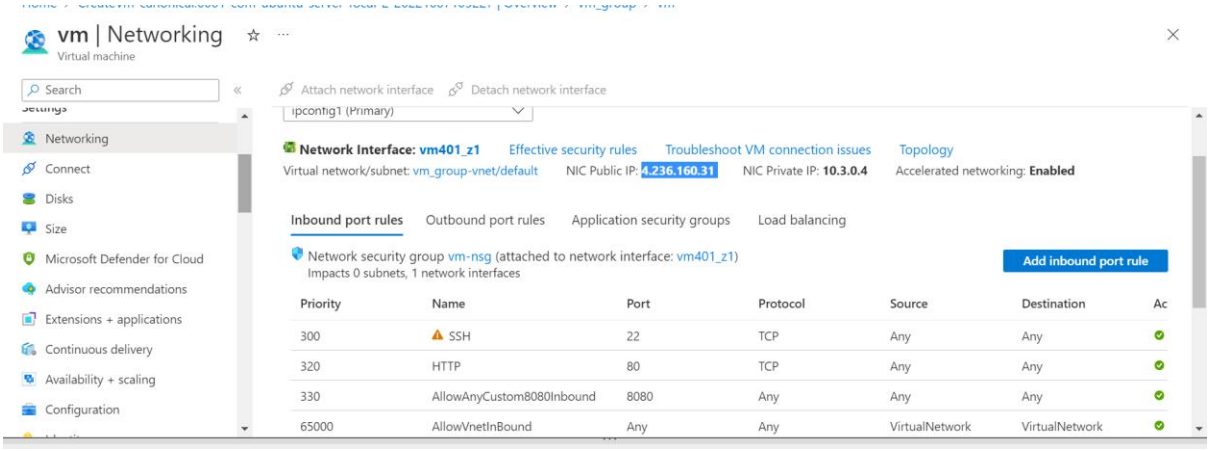


Github

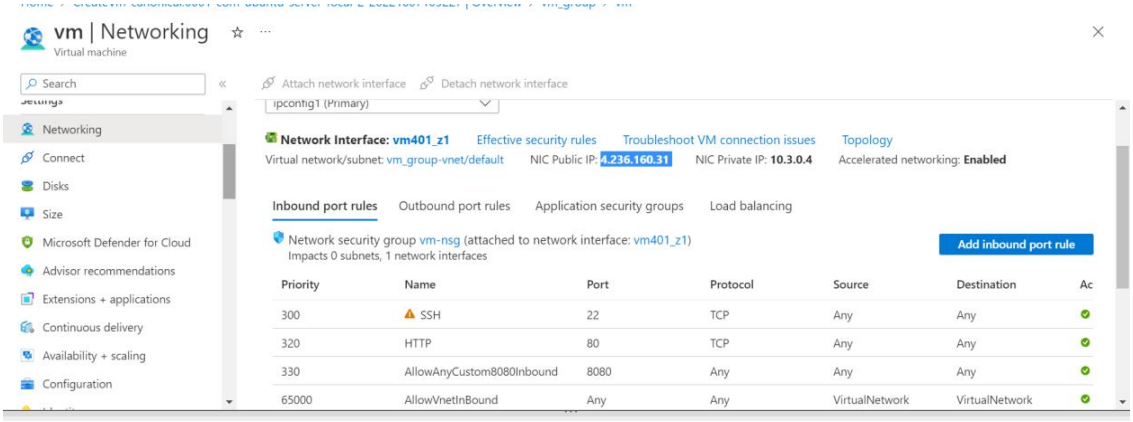
Then I uploaded my code onto Github so it's ready to be pulled for testing on Jenkins.

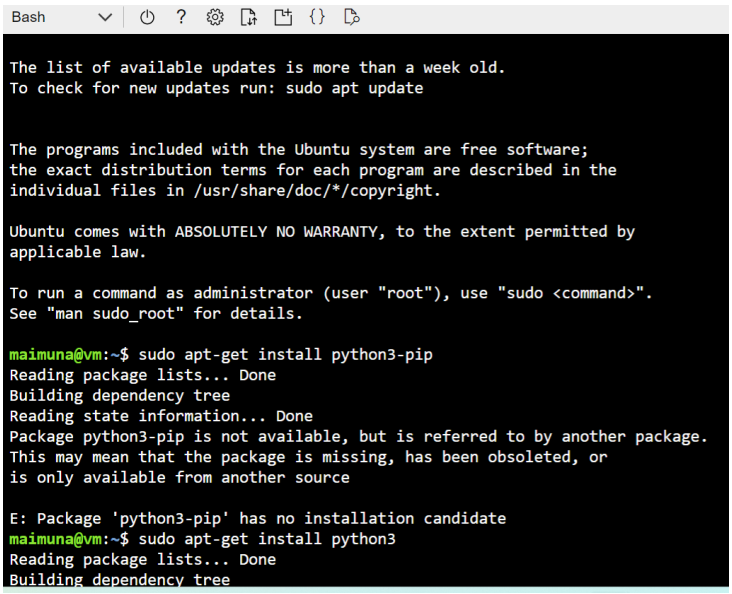
Linux VM

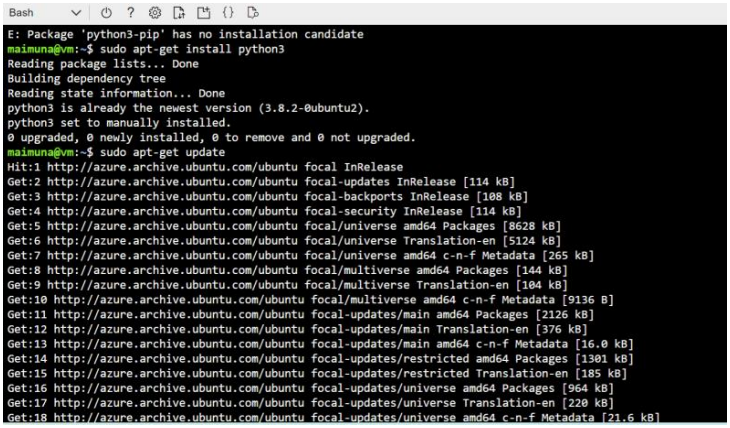
Next, I created a Linux VM on Azure Portal

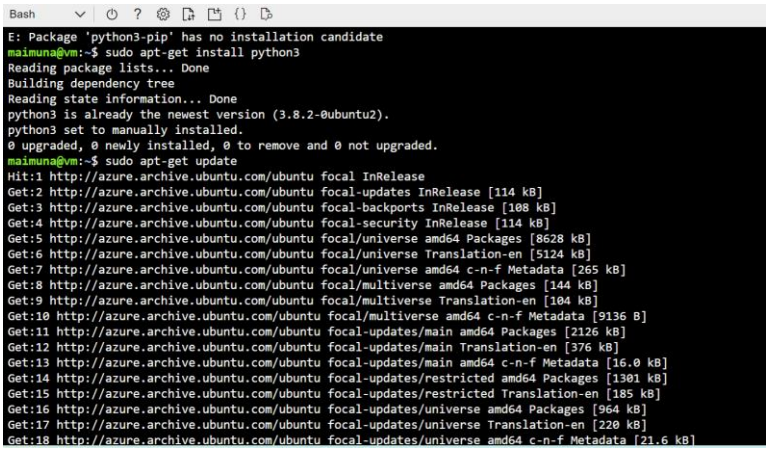


and installed Docker using port 5000 and created a containerized web app. I also installed Jenkins and added port 8080 on my VM to test my app.




Bash
The list of available updates is more than a week old.
To check for new updates run: sudo apt update
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
maimuna@vm:~$ sudo apt-get install python3-pip
Reading package lists... Done
Building dependency tree
Reading state information... Done
Package python3-pip is not available, but is referred to by another package.
This may mean that the package is missing, has been obsoleted, or
is only available from another source
E: Package 'python3-pip' has no installation candidate
maimuna@vm:~$ sudo apt-get install python3
Reading package lists... Done
Building dependency tree


Bash
E: Package 'python3-pip' has no installation candidate
maimuna@vm:~$ sudo apt-get install python3
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3 is already the newest version (3.8.2-0ubuntu2).
python3 set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
maimuna@vm:~$ sudo apt-get update
Hit:1 http://azure.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://azure.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://azure.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:4 http://azure.archive.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:5 http://azure.archive.ubuntu.com/ubuntu focal/universe amd64 Packages [8628 kB]
Get:6 http://azure.archive.ubuntu.com/ubuntu focal/universe Translation-en [5124 kB]
Get:7 http://azure.archive.ubuntu.com/ubuntu focal/universe amd64 c-n-f Metadata [265 kB]
Get:8 http://azure.archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [144 kB]
Get:9 http://azure.archive.ubuntu.com/ubuntu focal/multiverse Translation-en [104 kB]
Get:10 http://azure.archive.ubuntu.com/ubuntu focal/multiverse amd64 c-n-f Metadata [9136 B]
Get:11 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [2126 kB]
Get:12 http://azure.archive.ubuntu.com/ubuntu focal-updates/main Translation-en [376 kB]
Get:13 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [16.0 kB]
Get:14 http://azure.archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [1301 kB]
Get:15 http://azure.archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [185 kB]
Get:16 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [964 kB]
Get:17 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [220 kB]
Get:18 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [21.6 kB]


Bash
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Reading state information... Done
python3 is already the newest version (3.8.2-0ubuntu2).
python3 set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
maimuna@vm:~$ sudo apt-get update
Hit:1 http://azure.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://azure.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://azure.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:4 http://azure.archive.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:5 http://azure.archive.ubuntu.com/ubuntu focal/universe amd64 Packages [8628 kB]
Get:6 http://azure.archive.ubuntu.com/ubuntu focal/universe Translation-en [5124 kB]
Get:7 http://azure.archive.ubuntu.com/ubuntu focal/universe amd64 c-n-f Metadata [265 kB]
Get:8 http://azure.archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [144 kB]
Get:9 http://azure.archive.ubuntu.com/ubuntu focal/multiverse Translation-en [104 kB]
Get:10 http://azure.archive.ubuntu.com/ubuntu focal/multiverse amd64 c-n-f Metadata [9136 B]
Get:11 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [2126 kB]
Get:12 http://azure.archive.ubuntu.com/ubuntu focal-updates/main Translation-en [376 kB]
Get:13 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [16.0 kB]
Get:14 http://azure.archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [1301 kB]
Get:15 http://azure.archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [185 kB]
Get:16 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [964 kB]
Get:17 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [220 kB]
Get:18 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [21.6 kB]

```
Setting up python3-dev (3.8.2-0ubuntu2) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.9) ...
maimuna@vm:~$ sudo vi/etc/sudoers
sudo: vi/etc/sudoers: command not found
maimuna@vm:~$ sudo vi /etc/sudoers
maimuna@vm:~$ vim jenkinsinstall.sh
maimuna@vm:~$ ls
jenkinsinstall.sh
maimuna@vm:~$ ./jenkinsinstall.sh
-bash: ./jenkinsinstall.sh: Permission denied
maimuna@vm:~$ chmod +x jenkinsinstall.sh
maimuna@vm:~$ ./jenkinsinstall.sh
```

Bash

```
maimuna@vm:~$ sudo vi/etc/sudoers
sudo: vi/etc/sudoers: command not found
maimuna@vm:~$ sudo vi /etc/sudoers
maimuna@vm:~$ vim jenkinsinstall.sh
maimuna@vm:~$ ls
jenkinsinstall.sh
maimuna@vm:~$ ./jenkinsinstall.sh
-bash: ./jenkinsinstall.sh: Permission denied
maimuna@vm:~$ chmod +x jenkinsinstall.sh
maimuna@vm:~$ ./jenkinsinstall.sh
./jenkinsinstall.sh: line 4: [: too many arguments
updating and installing dependencies
Hit:1 http://azure.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://azure.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://azure.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:4 http://azure.archive.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Fetched 336 kB in 0s (751 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
15 packages can be upgraded. Run 'apt list --upgradable' to see them.

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

Extracting templates from packages: 100%
configuring jenkins user
downloading latest jenkins WAR
```

Bash

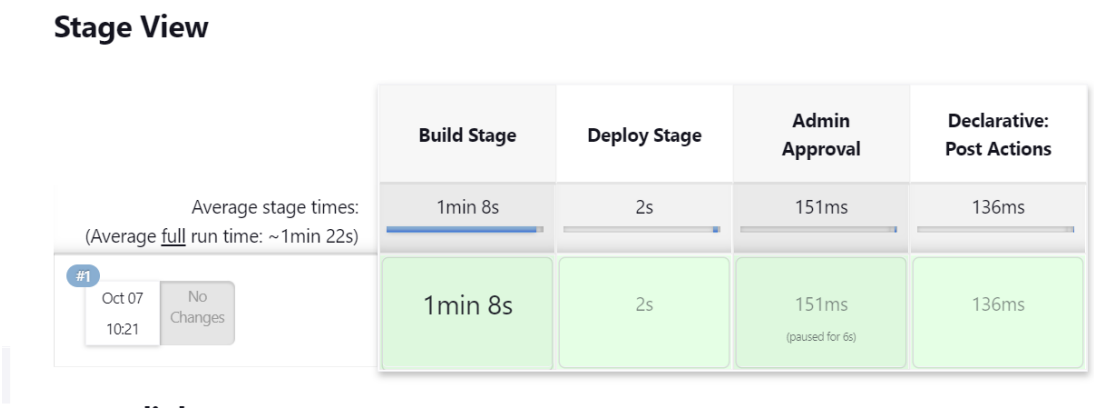
```
downloading latest jenkins WAR
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   245  100   245    0     0   1400      0 --:--:-- --:--:-- --:--:--  1400
100   228  100   228    0     0   1280      0 --:--:-- --:--:-- --:--:--  1280
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--     0
100 89.2M  100 89.2M    0     0  32.9M      0  0:00:02  0:00:02 --:--:-- 48.6M
setting up jenkins service
Created symlink /etc/systemd/system/multi-user.target.wants/jenkins.service → /etc/systemd/system/jenkins.service.
waiting for initial admin password
waiting for initial admin password
waiting for initial admin password
waiting for initial admin password
waiting for initial admin password
waiting for initial admin password
waiting for initial admin password
initial admin password: ae576201dbd54a14b33c57554fd22749
maimuna@vm:~$ sudo apt install curl -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
curl is already the newest version (7.68.0-1ubuntu2.13).
curl set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 15 not upgraded.
maimuna@vm:~$ curl https://get.docker.com | sudo bash
```

```
Bash

To run Docker as a non-privileged user, consider setting up the
Docker daemon in rootless mode for your user:

    dockerd-rootless-setuptool.sh install

Visit https://docs.docker.com/go/rootless/ to learn about rootless mode.


To run the Docker daemon as a fully privileged service, but granting non-root
users access, refer to https://docs.docker.com/go/daemon-access/

WARNING: Access to the remote API on a privileged Docker daemon is equivalent
         to root access on the host. Refer to the 'Docker daemon attack surface'
         documentation for details: https://docs.docker.com/go/attack-surface/

================================================================================

maimuna@vm:~$ docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create o
ne.
Username: maimuna22
Password:
```

```
maimuna@vm:~$ sudo docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create o
ne.
Username: maimuna22
Password:
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
maimuna@vm:~$ docker ps
Got permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Get "http://%2Fvar%2Frun%2Fdocker.sock/
v1.24/containers/json": dial unix /var/run/docker.sock: connect: permission denied
maimuna@vm:~$ sudo docker ps
CONTAINER ID   IMAGE          COMMAND           CREATED         STATUS         PORTS                                                  NAMES
30fd7fa4ae0a   38753f9d48d5   "python3 App.py"   2 minutes ago   Up 2 minutes   0.0.0.0:5000->5000/tcp, :::5000->5000/tcp, 5001/tcp   optimistic_
pascal
maimuna@vm:~$ sudo docker ps
```

Pipeline(Explain and stages):

I set up a new pipeline and linked my GitHub repository to test my build.

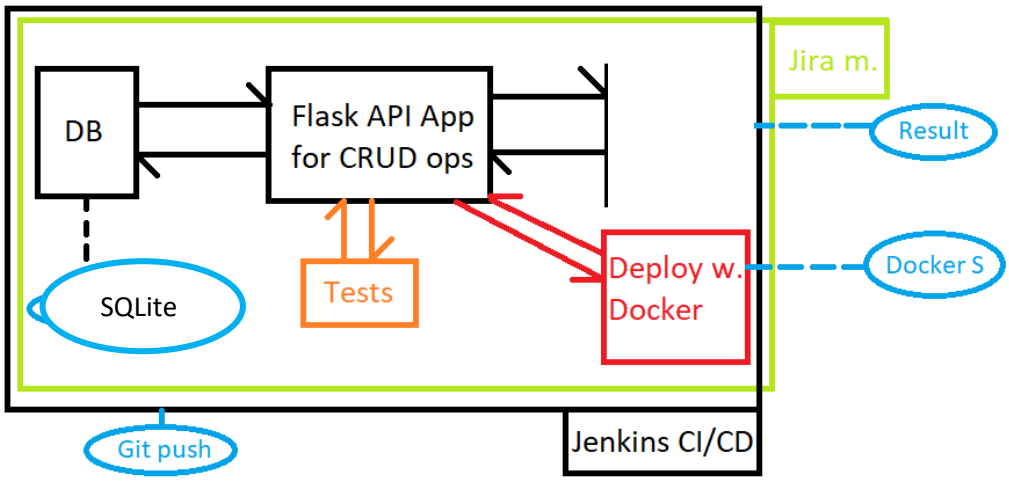


This is my jenkins code:

57 lines (53 sloc) | 837 Bytes

```
pipeline
{
    agent none
    stages
        {
        stage('Build Stage')
                {
                        agent any
                        steps
                        {
                                echo 'This is Build part'
                                sh 'chmod 777 build.sh'

                                sh './build.sh'


                        }
                }
        stage('Deploy Stage')
                {
                        agent any
                        steps
                        {
                                echo 'This is Deploy part'
                                sh 'chmod 777 run.sh'
                                sh './run.sh'


                        }
                }
        stage('Admin Approval')
                {
                        steps
                        {
                                input "Does the staging environment look ok?"
                        }
                }
        }
post
        {
        success
                {
                        echo 'Build Successfull!!'
                }
        failure
                {
                        echo 'Sorry mate! build is Failed :('
                }
        unstable
                {
                        echo 'Run was marked as unstable'
                }
        changed
                {
                        echo 'Hey look at this, Pipeline state is changed.'
                }
        }
}
```

Blueprint of tools used:



Future probable updates:

- Connect Database
- Allow users to upload recipe