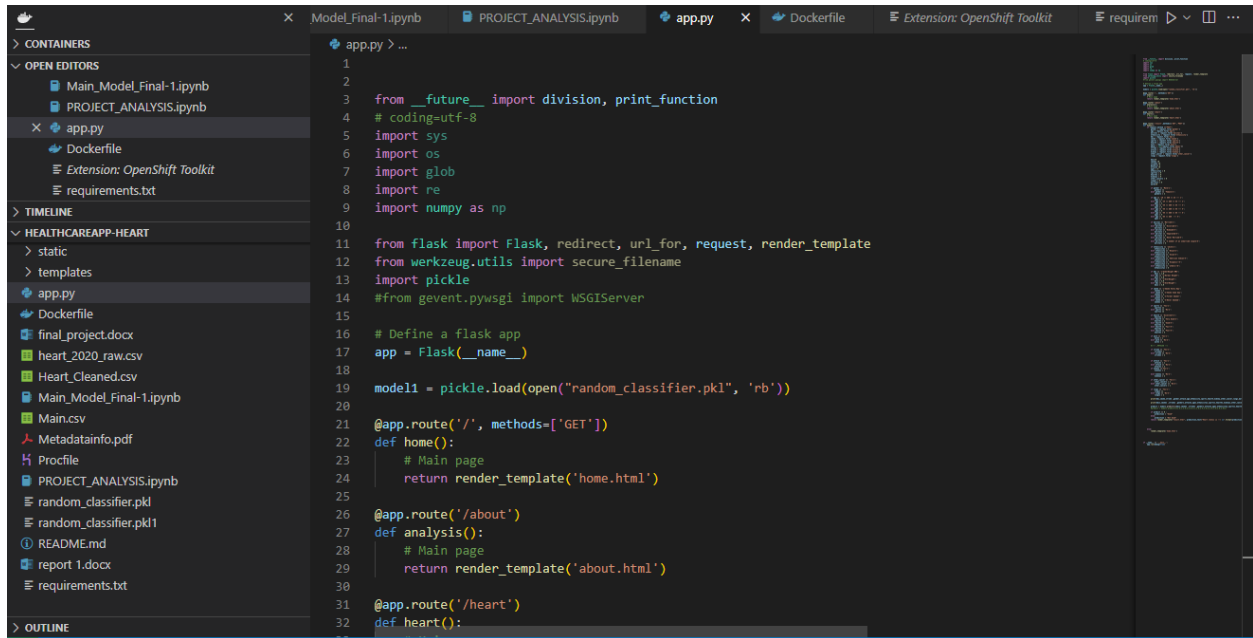


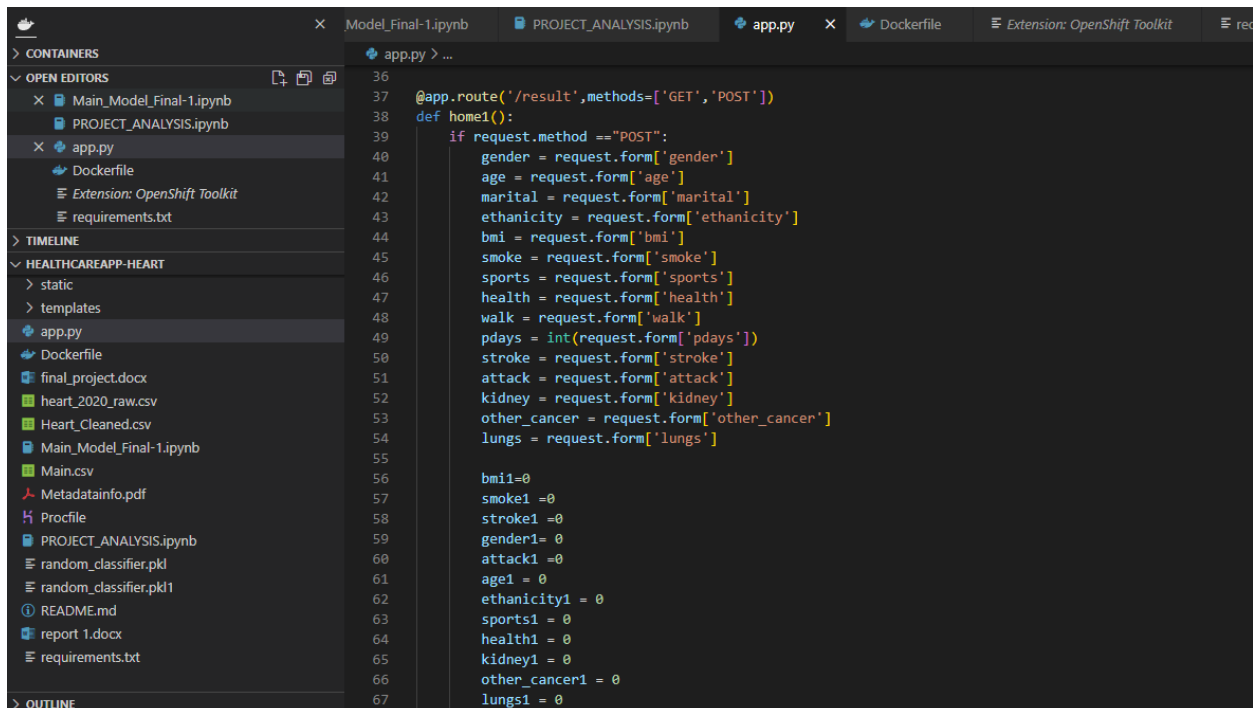
OPENSIFT PROJECT DEPLOYMENT

STEP1: Create flask app



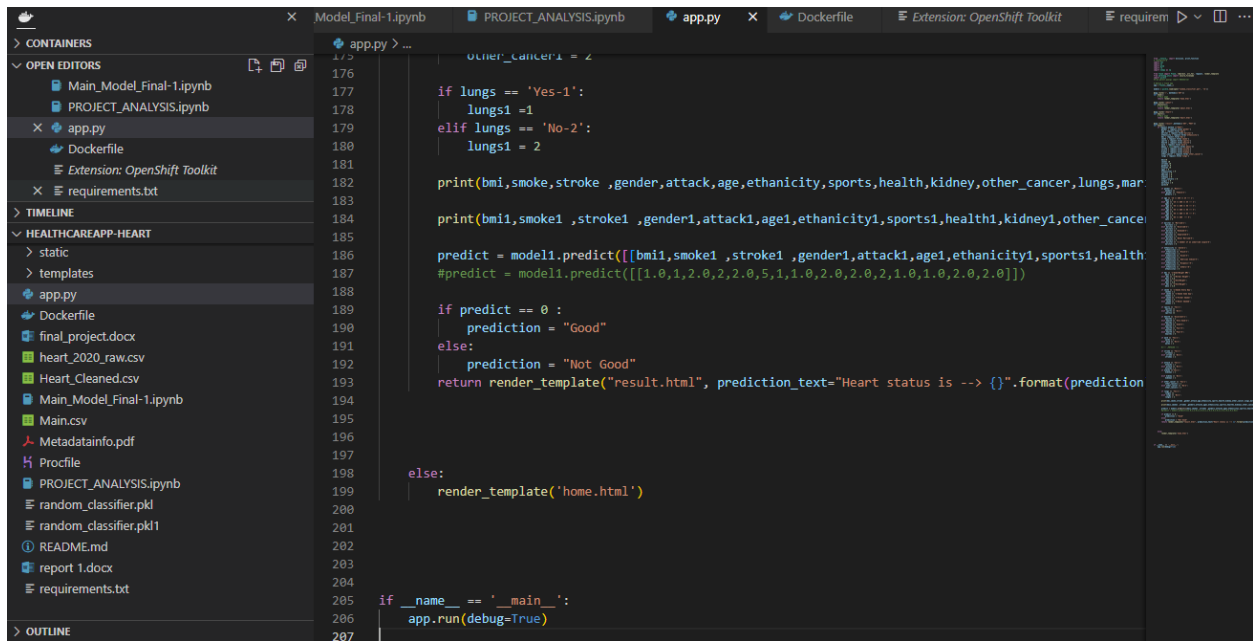
The screenshot shows the VS Code editor with the 'app.py' file open. The left sidebar displays the 'CONTAINERS' and 'OPEN EDITORS' panels. The 'CONTAINERS' panel shows the 'HEALTHCAREAPP-HEART' container. The 'OPEN EDITORS' panel shows the 'app.py' file. The main editor area displays the following code:

```
1
2
3 from __future__ import division, print_function
4 # coding=utf-8
5 import sys
6 import os
7 import glob
8 import re
9 import numpy as np
10
11 from flask import Flask, redirect, url_for, request, render_template
12 from werkzeug.utils import secure_filename
13 import pickle
14 #from gevent.pywsgi import WSGIServer
15
16 # Define a flask app
17 app = Flask(__name__)
18
19 model1 = pickle.load(open("random_classifier.pkl", 'rb'))
20
21 @app.route('/', methods=['GET'])
22 def home():
23     # Main page
24     return render_template('home.html')
25
26 @app.route('/about')
27 def analysis():
28     # Main page
29     return render_template('about.html')
30
31 @app.route('/heart')
32 def heart():
```

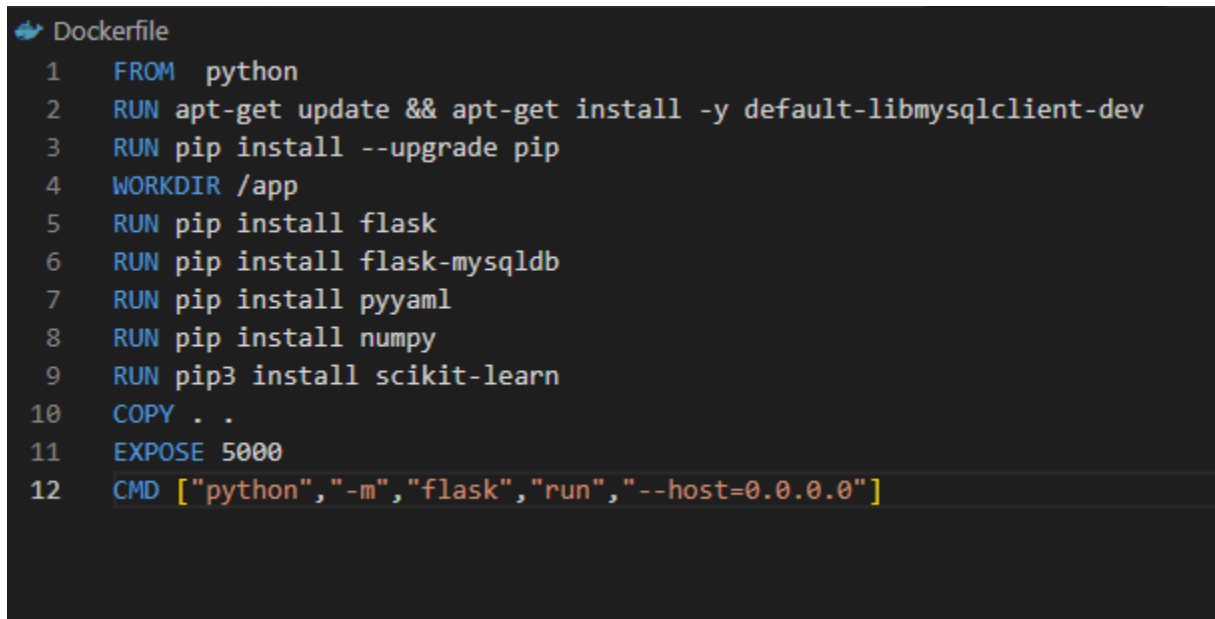


The screenshot shows the VS Code editor with the 'app.py' file open. The left sidebar displays the 'CONTAINERS' and 'OPEN EDITORS' panels. The 'CONTAINERS' panel shows the 'HEALTHCAREAPP-HEART' container. The 'OPEN EDITORS' panel shows the 'app.py' file. The main editor area displays the following code:

```
36
37 @app.route('/result', methods=['GET', 'POST'])
38 def home1():
39     if request.method == "POST":
40         gender = request.form['gender']
41         age = request.form['age']
42         marital = request.form['marital']
43         ethnicity = request.form['ethnicity']
44         bmi = request.form['bmi']
45         smoke = request.form['smoke']
46         sports = request.form['sports']
47         health = request.form['health']
48         walk = request.form['walk']
49         pdays = int(request.form['pdays'])
50         stroke = request.form['stroke']
51         attack = request.form['attack']
52         kidney = request.form['kidney']
53         other_cancer = request.form['other_cancer']
54         lungs = request.form['lungs']
55
56         bmi1=0
57         smoke1 =0
58         stroke1 =0
59         gender1= 0
60         attack1 =0
61         age1 = 0
62         ethnicity1 = 0
63         sports1 = 0
64         health1 = 0
65         kidney1 = 0
66         other_cancer1 = 0
67         lungs1 = 0
```



STEP 2: Create docker file



STEP 3: Create docker image

The screenshot shows the VS Code interface with the following components:

- Left Panel (EXPLORER):**
 - CONTAINERS: Dockerfile
 - OPEN EDITORS: Main_Model_Final-1.ipynb, PROJECT_ANALYSIS.ipynb, app.py, Dockerfile
 - TIMELINE: HEALTHCAREAPP-HEART
 - HEALTHCAREAPP-HEART:
 - static
 - templates
 - app.py
 - Dockerfile
 - final_project.docx
 - heart_2020_raw.csv
 - Heart_Cleaned.csv
 - Main_Model_Final-1.ipynb
 - Main.csv
 - Metadatainfo.pdf
 - Procfile
 - PROJECT_ANALYSIS.ipynb
 - random_classifier.pkl
 - random_classifier.pkl1
 - README.md
 - report.1.docx
 - requirements.txt
 - OUTLINE
- Editor (Dockerfile):**

```

1 WORKDIR /app
2 RUN pip install flask
3 RUN pip install flask-mysqldb
4 RUN pip install pyyaml
5 RUN pip install numpy
6 RUN pip3 install scikit-learn
7 COPY . .
8 EXPOSE 5000
9 CMD ["python", "-m", "flask", "run", "--host=0.0.0.0"]

```
- Terminal:**

```

PS F:\CDAC\FINAL_PROJECT\FULL_FINAL\healthcareapp-heart> docker images
rohan91196/heart 1.0 64279f7a7dc0 9 minutes ago 1.73GB
<none> 4b2096bd8bab 58 minutes ago 1.51GB
flaskofficie-web latest 39d630c98260 About an hour ago 1.06GB
rohan91196/flaskofficie-web 1.0 39d630c98260 About an hour ago 1.06GB
rohan91196/flaskofficie-web <none> 41f3de837ea3 19 hours ago 1.06GB
mysql latest 8189e588b0e8 2 weeks ago 564MB
rohan91196/mysql 1.0 8189e588b0e8 2 weeks ago 564MB
gcr.io/k8s-minikube/kicbase v0.0.39 67a4b1138d2d 4 weeks ago 1.05GB
PS F:\CDAC\FINAL_PROJECT\FULL_FINAL\healthcareapp-heart> docker run -d -p 5000:5000 rohan91196/heart
Unable to find image 'rohan91196/heart:latest' locally
docker: Error response from daemon: manifest for rohan91196/heart:latest not found: manifest unknown: manifest unknown.
See 'docker run --help'.
PS F:\CDAC\FINAL_PROJECT\FULL_FINAL\healthcareapp-heart> docker run -d -p 5000:5000 rohan91196/heart:1.0
3a7c48baf5938d5252f82906ad8a3960d8ae9e40b0007b67e86b4493fd6f47ea
PS F:\CDAC\FINAL_PROJECT\FULL_FINAL\healthcareapp-heart> docker push rohan91196/heart:1.0
16fd023a6db9: Retrying in 1 second
b5efc449067f: Retrying in 1 second
dc74c3b30304: Retrying in 1 second
f879c1335cb1: Pushed
0d11b3527d69: Pushed
81e3f2e199b4: Retrying in 3 seconds

```

STEP 4: Push images to docker hub

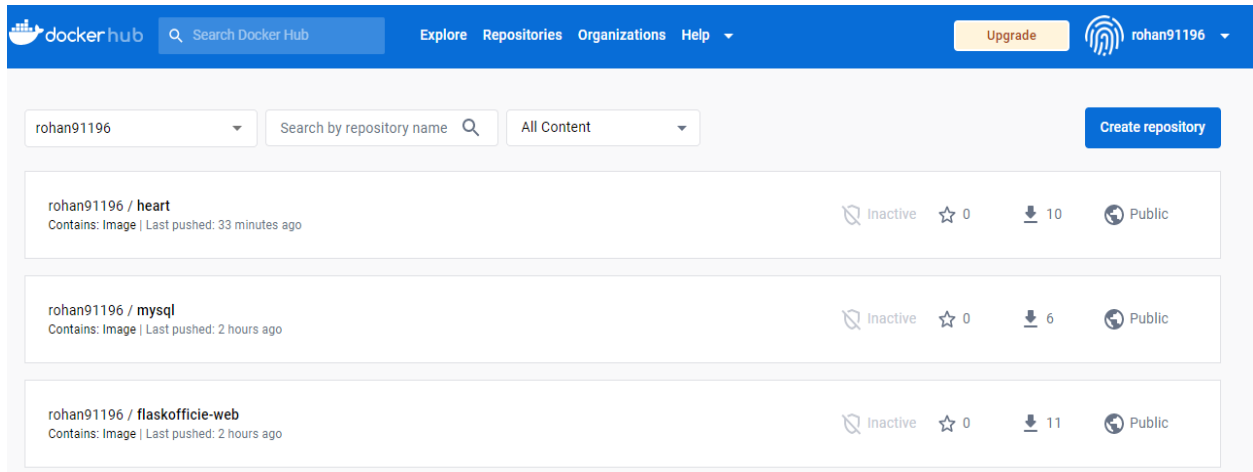
The screenshot shows the VS Code interface with the following components:

- Left Panel (EXPLORER):** (Same as the previous screenshot)
- Editor (Dockerfile):** (Same as the previous screenshot)
- Terminal:**

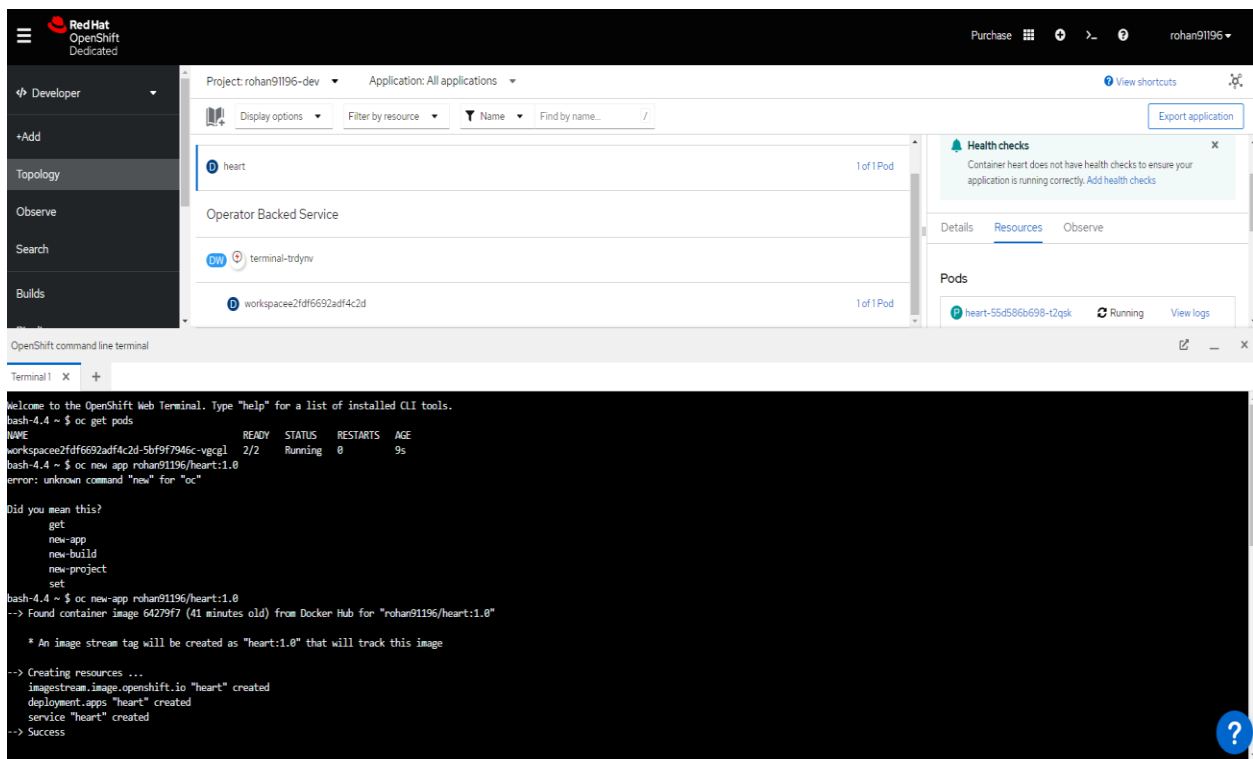
```

PS F:\CDAC\FINAL_PROJECT\FULL_FINAL\healthcareapp-heart> docker push rohan91196/heart:1.0
The push refers to repository [docker.io/rohan91196/heart]
16fd023a6db9: Pushed
b5efc449067f: Pushed
dc74c3b30304: Pushed
f879c1335cb1: Layer already exists
0d11b3527d69: Layer already exists
81e3f2e199b4: Pushed
27df6f4dfb0b: Pushed
f8e6e671685f: Pushed
b34df2bb743: Pushed
889828f94722: Pushed
b0f747a5176b: Mounted from library/python
7dac77253a2b: Pushed
0007505dc811: Pushed
f43725f97b9f: Pushed
9c42af2c6418: Pushed
d96e248f10e6: Pushed
d925e0fae4e6: Pushed
1.0: digest: sha256:12983ba90ffe4218a9151f9a660673a87456598e4a69479c591f5ce5ee27de92 size: 3906
PS F:\CDAC\FINAL_PROJECT\FULL_FINAL\healthcareapp-heart>

```



STEP 5: Create open shift pods using openshift cli with docker image



STEP 6: As pods are get created now exposing the services of pods

The screenshot shows the Red Hat OpenShift console interface. The left sidebar contains navigation options: Developer, Add, Topology, Observe, Search, and Builds. The main area displays the 'heart' application, which is an Operator Backed Service. Below this, there is a table of pods:

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
heart	ClusterIP	172.30.59.149	<none>	5000/TCP	30s
helloapp	ClusterIP	172.30.221.155	<none>	3000/TCP	3d20h
modelmesh-serving	ClusterIP	None	<none>	8033/TCP, 8008/TCP, 8443/TCP, 2112/TCP	3d20h
workspace2fd6692adff4c2d	ClusterIP	172.30.169.12	<none>	4444/TCP	2m42s

Below the table, there is a section for 'heart' with details on its host/port, path, services, port, termination, and wildcard. The console also shows a terminal window with the following output:

```

deployment.apps "heart" created
service "heart" created
--> Success
Application is not exposed. You can expose services to the outside world by executing one or more of the commands below:
'oc expose service/heart'
Run 'oc status' to view your app.
bash-4.4 ~ $ oc expose service/heart
route.route.openshift.io/heart exposed
bash-4.4 ~ $ oc get svc
NAME                                TYPE                CLUSTER-IP    EXTERNAL-IP    PORT(S)                                AGE
heart                              ClusterIP           172.30.59.149 <none>         5000/TCP                               30s
helloapp                           ClusterIP           172.30.221.155 <none>         3000/TCP                               3d20h
modelmesh-serving                  ClusterIP           None          <none>         8033/TCP, 8008/TCP, 8443/TCP, 2112/TCP 3d20h
workspace2fd6692adff4c2d-service   ClusterIP           172.30.169.12 <none>         4444/TCP                               2m42s
bash-4.4 ~ $ oc get route/heart
NAME      HOST/PORT
heart     heart-rohan91196-dev.apps.sandbox-m3.1530.p1.openshiftapps.com
bash-4.4 ~ $ oc logs heart
Error from server (NotFound): pods "heart" not found
bash-4.4 ~ $ oc get pods
NAME                                READY    STATUS    RESTARTS   AGE
heart-55d586b698-t2qsk              1/1      Running   0           26s
workspace2fd6692adff4c2d-5bf9f7946c-vqcg1 2/2      Running   0           4m18s

```

STEP 8: Exposing the route of pods and services

The screenshot shows the Red Hat OpenShift console interface. The left sidebar contains navigation options: Developer, Add, Topology, Observe, Search, and Builds. The main area displays the 'heart' application, which is an Operator Backed Service. Below this, there is a table of pods:

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
heart	ClusterIP	172.30.59.149	<none>	5000/TCP	30s
helloapp	ClusterIP	172.30.221.155	<none>	3000/TCP	3d20h
modelmesh-serving	ClusterIP	None	<none>	8033/TCP, 8008/TCP, 8443/TCP, 2112/TCP	3d20h
workspace2fd6692adff4c2d	ClusterIP	172.30.169.12	<none>	4444/TCP	2m42s

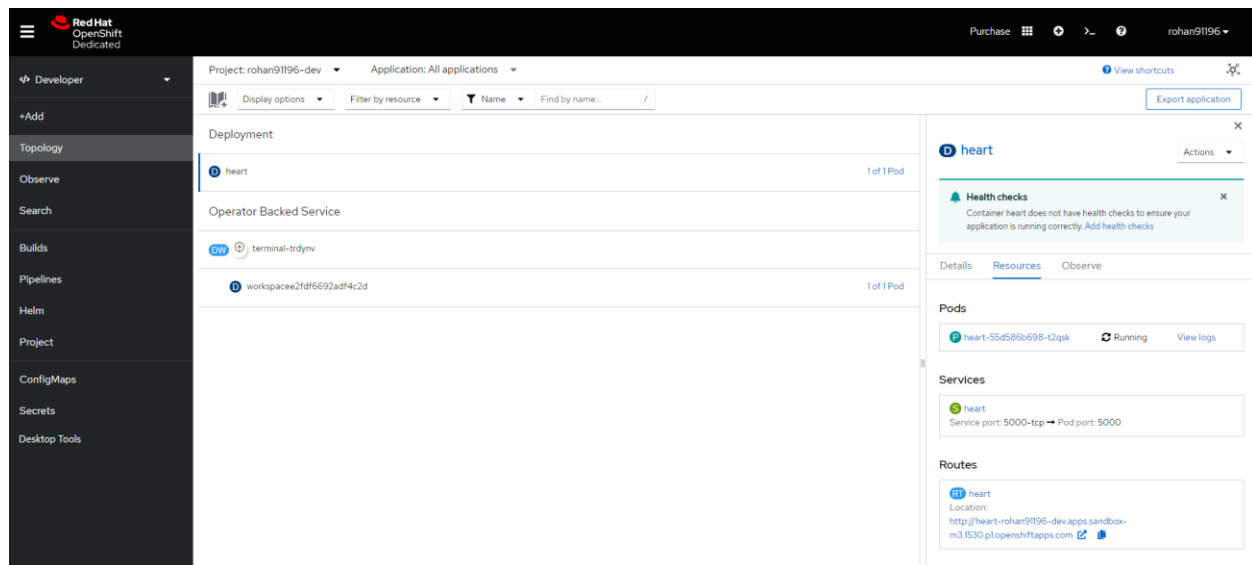
Below the table, there is a section for 'heart' with details on its host/port, path, services, port, termination, and wildcard. The console also shows a terminal window with the following output:

```

modelmesh-serving ClusterIP None <none> 8033/TCP, 8008/TCP, 8443/TCP, 2112/TCP 3d20h
workspace2fd6692adff4c2d-service ClusterIP 172.30.169.12 <none> 4444/TCP 2m42s
bash-4.4 ~ $ oc get route/heart
NAME      HOST/PORT
heart     heart-rohan91196-dev.apps.sandbox-m3.1530.p1.openshiftapps.com
bash-4.4 ~ $ oc logs heart
Error from server (NotFound): pods "heart" not found
bash-4.4 ~ $ oc get pods
NAME                                READY    STATUS    RESTARTS   AGE
heart-55d586b698-t2qsk              1/1      Running   0           26s
workspace2fd6692adff4c2d-5bf9f7946c-vqcg1 2/2      Running   0           4m18s
bash-4.4 ~ $ oc logs heart-55d586b698-t2qsk
/usr/local/lib/python3.11/site-packages/sklearn/base.py:318: UserWarning: Trying to unpickle estimator DecisionTreeClassifier from version 1.0.2 when using version 1.2.2. This might lead to breaking code or invalid results. Use at your own risk. For more info please refer to: https://scikit-learn.org/stable/model_persistence.html#security-maintainability-limitations
  warnings.warn(
/usr/local/lib/python3.11/site-packages/sklearn/base.py:318: UserWarning: Trying to unpickle estimator RandomForestClassifier from version 1.0.2 when using version 1.2.2. This might lead to breaking code or invalid results. Use at your own risk. For more info please refer to: https://scikit-learn.org/stable/model_persistence.html#security-maintainability-limitations
  warnings.warn(
* Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on all addresses (0.0.0.0)
* Running on http://0.0.0.0:5000
* Running on http://10.128.6.122:5000
Press CTRL+C to quit
bash-4.4 ~ $

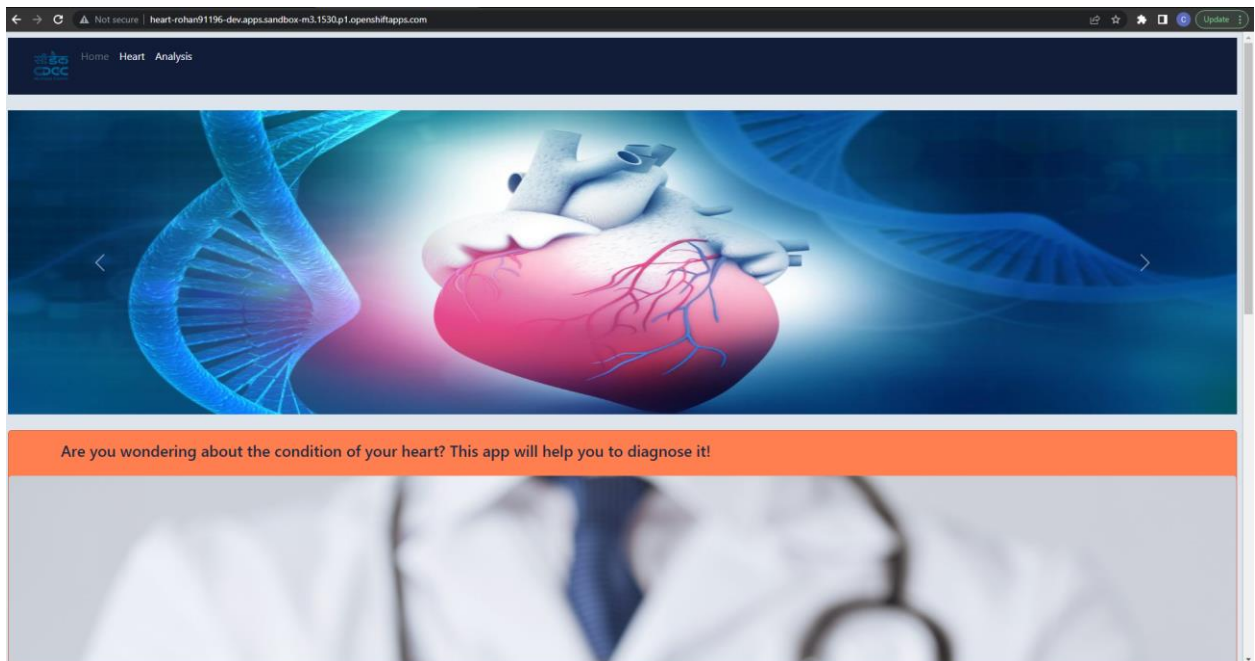
```

STEP 9: Checking pod status



STEP 10: Opening the route and enjoying app

a. Home page



b. Parameter page

← → ↻ Not secure | heart-rohan01196-dev.apps.sandbox-m3.1530.p1.openshiftapps.com/heart

Home Heart Analysis

Select your Gender.

-- Select type --

Select your Age category.

-- Select type --

Select your Marital Status.

-- Select type --

What is your Ethnicity?

-- Select type --

Select your BMI Category?

-- Select type --

Select the smoking category you fall under.

-- Select type --

Have you played any sports (running, biking, etc.) in the past month?

-- Select type --

Defined your General Health.

-- Select type --

Do you have serious difficulty walking or climbing stairs?

-- Select type --

For how many days during the past 30 days your physical health not good?

Days

← → ↻ Not secure | heart-rohan01196-dev.apps.sandbox-m3.1530.p1.openshiftapps.com/heart

Have you played any sports (running, biking, etc.) in the past month?

-- Select type --

Defined your General Health.

-- Select type --

Do you have serious difficulty walking or climbing stairs?

-- Select type --

For how many days during the past 30 days your physical health not good?

Days

Do you dad Stroke before?

-- Select type --

Do you had a heart attack, also called a myocardial infarction?

-- Select type --

Do you have any Kidney diseases?

-- Select type --

Do you have any Cancer Other than Skin Cancer?

-- Select type --

Do you Have chronic obstructive pulmonary disease, C.O.P.D., emphysema or chronic bronchitis?


-- Select type --

Submit

c. Result Page

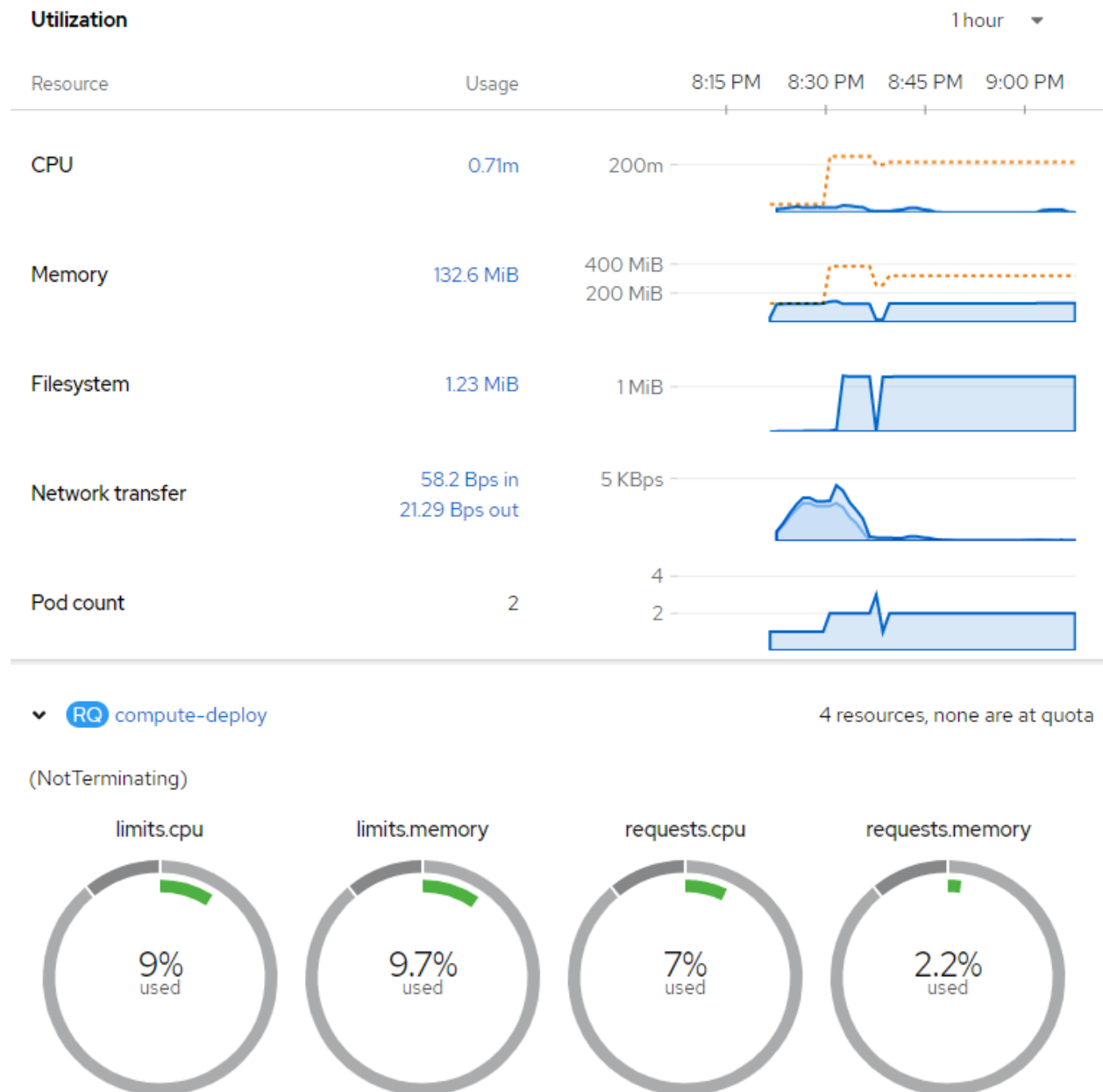
← → ↻ Not secure | heart-rohan01196-dev.apps.sandbox-m3.1530.p1.openshiftapps.com/result

Home Heart Result



Heart status is --> Not Good

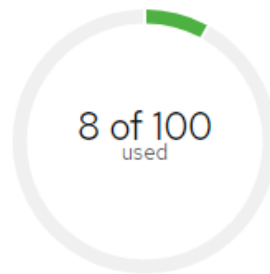
STEP 11: Summary Dashboard



▼ **ACRQ** for-rohan91196-cm

1 resource, none are at quota

count/configmaps



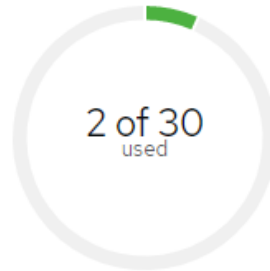
▼ **ACRQ** for-rohan91196-deployments

3 resources, none are at quota

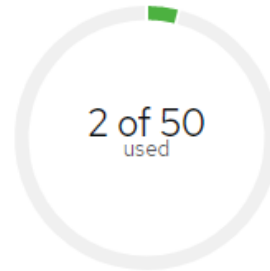
count/deploymentconfi...



count/deployments.apps

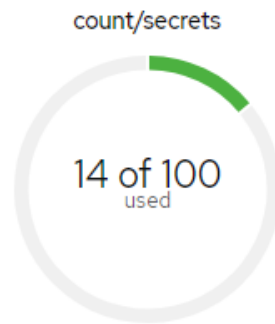


count/pods



▼ **ACRQ** for-rohan91196-secrets

1 resource, none are at quota



▼ **ACRQ** for-rohan91196-services

1 resource, none are at quota

