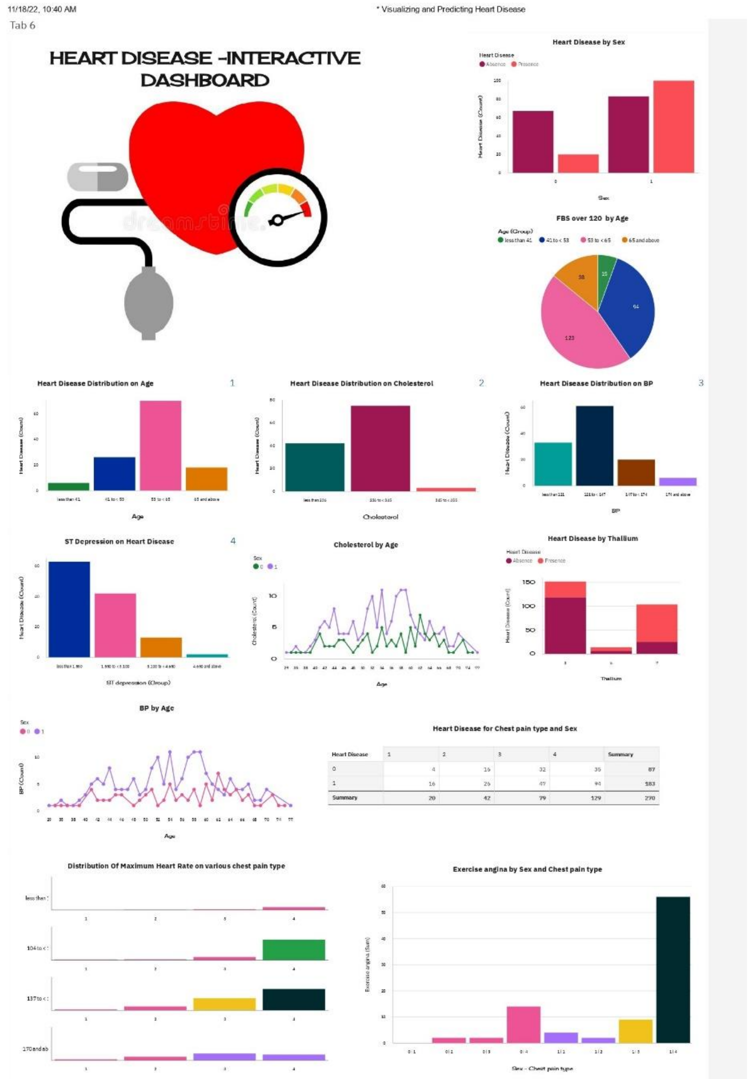
Project Development
PhaseModel Performance
Test

Date	18 November 2022
Team ID	PNT2022TMID52957
Project Name	Visualizing and Predicting Heart Diseases with an Interactive Dashboard
Maximum Marks	10 Marks

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Screenshot / Values
1.	Dashboard designs	No of Visualizations / Graphs – 5 dashboard 25 visualization 

11/18/22, 10:40 AM

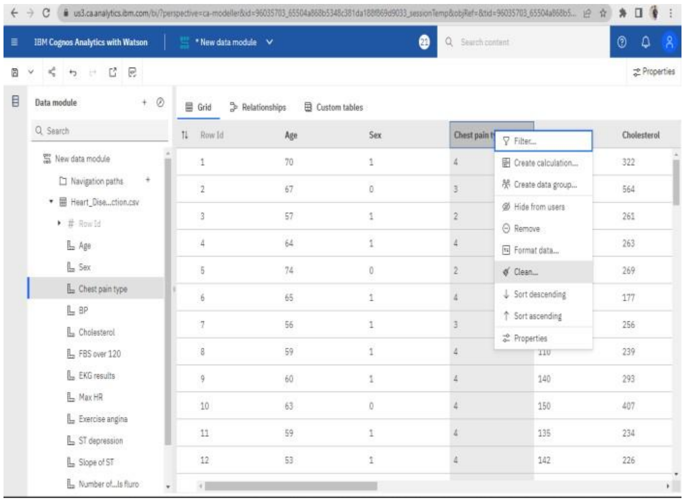
* Visualizing and Predicting Heart Disease

Tab 6

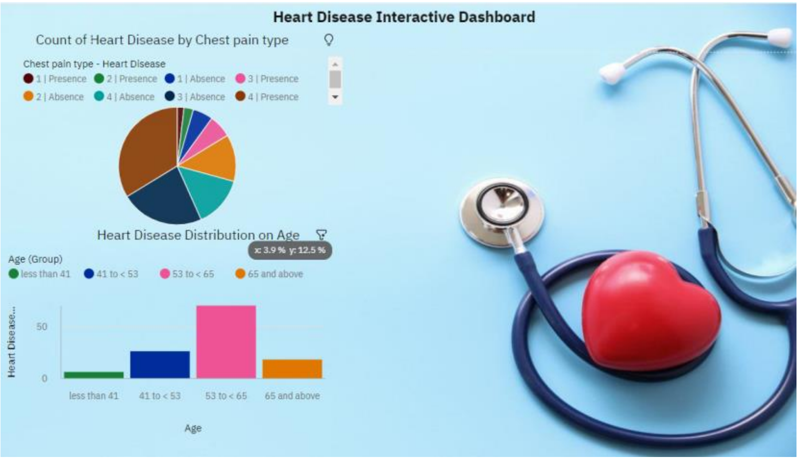
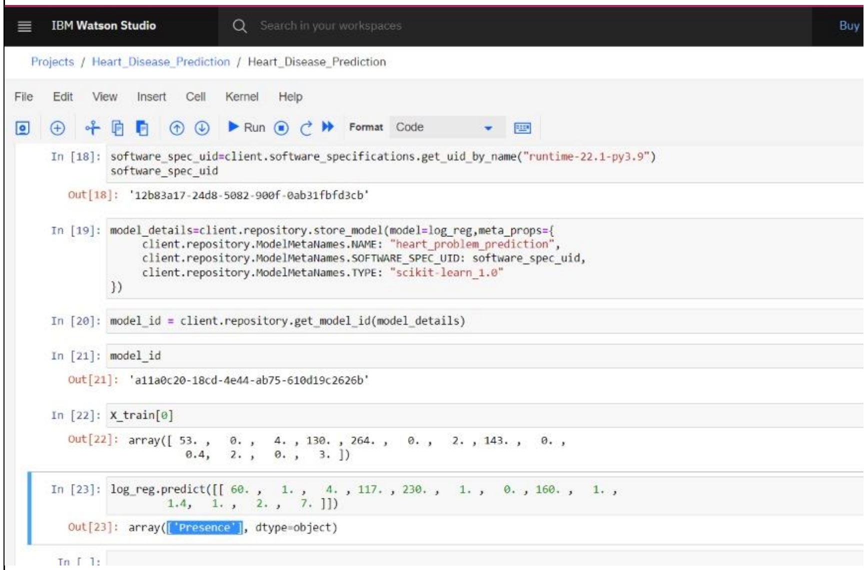
Heart Disease for Chest pain type and Sex

Heart Disease	1	2	3	4	Summary
0	4	16	32	35	87
1	16	26	47	94	183
Summary	20	42	79	129	270

HEART DISEASE -INTERACTIVE DASHBOARD
Heart Disease by Sex
Heart Disease
Absence
Presence
Sex
FBS over 120 by Age
Age (Group)
less than 41
41 to < 53
53 to < 65
65 and above
Heart Disease Distribution on Age
1
Age
Heart Disease Distribution on Cholesterol
2
Cholesterol
Heart Disease Distribution on BP
3
BP
ST Depression on Heart Disease
4
ST depression (Group)
Cholesterol by Age
Heart Disease by Thallium
Thallium
BP by Age
Distribution Of Maximum Heart Rate on various chest pain type
Exercise angina by Sex and Chest pain type
Sex - Chest pain type

<table>
<tr><td>2.</td><td>Data Response</td><td>It hides certain aspects of the visualization if the size is limited, to maximize the space that is available to display data.
• Its Create with relationship with another explorations
• There was another data exploration with various continuousvalues ,those values was grouped as common.</td></tr>
<tr><td>3.</td><td>Dataset collectionand Modification</td><td>As per project ideation the dataset are collected from smartwatches by theand work the dataset with cleaning process


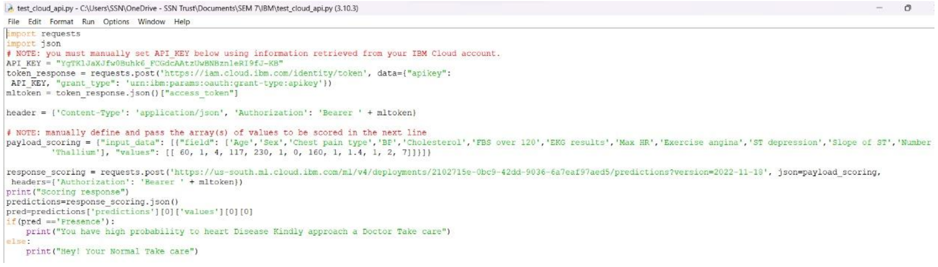
<table>
<tr><th>Row Id</th><th>Age</th><th>Sex</th><th>Chest pain t</th><th></th><th>Cholesterol</th></tr>
<tr><td>1</td><td>70</td><td>1</td><td>4</td><td></td><td>322</td></tr>
<tr><td>2</td><td>67</td><td>0</td><td>3</td><td></td><td>564</td></tr>
<tr><td>3</td><td>57</td><td>1</td><td>2</td><td></td><td>261</td></tr>
<tr><td>4</td><td>64</td><td>1</td><td>4</td><td></td><td>263</td></tr>
<tr><td>5</td><td>74</td><td>0</td><td>2</td><td></td><td>269</td></tr>
<tr><td>6</td><td>65</td><td>1</td><td>4</td><td></td><td>177</td></tr>
<tr><td>7</td><td>56</td><td>1</td><td>3</td><td></td><td>256</td></tr>
<tr><td>8</td><td>59</td><td>1</td><td>4</td><td>110</td><td>239</td></tr>
<tr><td>9</td><td>60</td><td>1</td><td>4</td><td>140</td><td>293</td></tr>
<tr><td>10</td><td>63</td><td>0</td><td>4</td><td>150</td><td>407</td></tr>
<tr><td>11</td><td>59</td><td>1</td><td>4</td><td>135</td><td>234</td></tr>
<tr><td>12</td><td>53</td><td>1</td><td>4</td><td>142</td><td>226</td></tr>
</table></td></tr>
</table>

4.	Utilization of DataFilters	IN Cognos Dashboard utilization of the filtration to be filtered of all explorations of the dashboard
5.	Effective User Story	No of Scene Added – 15 stories with 2-3 visualizations in each story 
6.	Deployment of ML model for prediction in IBM Cloud	By user input their parametrs like age,sex,BP etc logistic regression is deployed in IBM cloud and it will display whether Heart disease is presence or absence  IBM Watson Studio Search in your workspaces Buy Projects / Heart_Disease_Prediction / Heart_Disease_Prediction File Edit View Insert Cell Kernel Help Run Format Code

```
In [18]: software_spec_uid=client.software_specifications.get_uid_by_name("runtime-22.1-py3.9")
         software_spec_uid

Out[18]: '12b83a17-24d8-5082-900f-0ab31fbfd3cb'

In [19]: model_details=client.repository.store_model(model=log_reg,meta_props={
             client.repository.ModelMetaNames.NAME: "heart_problem_prediction",
             client.repository.ModelMetaNames.SOFTWARE_SPEC_UID: software_spec_uid,
             client.repository.ModelMetaNames.TYPE: "scikit-learn_1.0"
         })

In [20]: model_id = client.repository.get_model_id(model_details)

In [21]: model_id

Out[21]: 'a11a0c20-18cd-4e44-ab75-610d19c2626b'

In [22]: X_train[0]

Out[22]: array([ 53. ,   0. ,   4. , 130. , 264. ,   0. ,   2. , 143. ,   0. ,
                 0.4,   2. ,   0. ,   3. ])

In [23]: log_reg.predict([[ 60. ,   1. ,   4. , 117. , 230. ,   1. ,   0. , 160. ,   1. ,
                   1.4,   1. ,   2. ,   7. ]])

Out[23]: array(['Presence'], dtype=object)

In [ ]:
```

7.	Heart Disease Prediction in python using deployed model in IBM Cloud.	Heart Disease is predicted by user giving their details in python itself which use the deployed model in IBM cloud as backend.

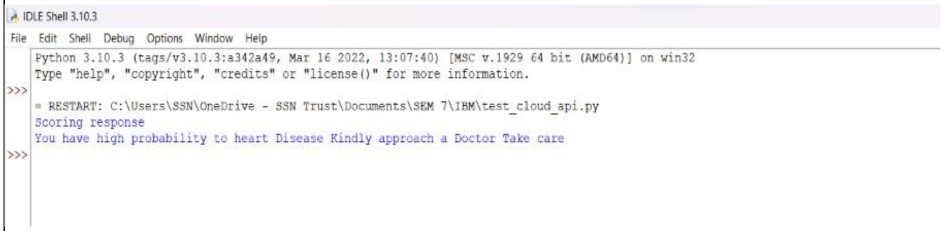
Code in Python:



test_cloud_api.py - C:\Users\SSN\OneDrive - SSN Trust\Documents\SEM 7\IBM\test_cloud_api.py (3.10.3)
File Edit Format Run Options Window Help

```python
import requests
import json
# NOTE: you must manually set API_KEY below using information retrieved from your IBM Cloud account.
API_KEY = "YgTKlJaXJfw0Buhk6_FCGdcAAtzUwBNBznleRI9fJ-KB"
token_response = requests.post('https://iam.cloud.ibm.com/identity/token', data={"apikey":
 API_KEY, "grant_type": 'urn:ibm:params:oauth:grant-type:apikey'})
mltoken = token_response.json()["access_token"]

header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + mltoken}

# NOTE: manually define and pass the array(s) of values to be scored in the next line
payload_scoring = {"input_data": [{"field": ['Age','Sex','Chest pain type','BP','Cholesterol','FBS over 120','EKG results','Max HR','Exercise angina','ST depression','Slope of ST','Number
         'Thallium'], "values": [[ 60, 1, 4, 117, 230, 1, 0, 160, 1, 1.4, 1, 2, 7]]}]}

response_scoring = requests.post('https://us-south.ml.cloud.ibm.com/ml/v4/deployments/2102715e-0bc9-42dd-9036-6a7eaf97aed5/predictions?version=2022-11-18', json=payload_scoring,
 headers={'Authorization': 'Bearer ' + mltoken})
print("Scoring response")
predictions=response_scoring.json()
pred=predictions['predictions'][0]['values'][0][0]
if(pred =='Presence'):
    print("You have high probability to heart Disease Kindly approach a Doctor Take care")
else:
    print("Hey! Your Normal Take care")
```

Output :



```
    Python 3.10.3 (tags/v3.10.3:a342a49, Mar 16 2022, 13:07:40) [MSC v.1929 64 bit (AMD64)] on win32
    Type "help", "copyright", "credits" or "license()" for more information.
>>>
    = RESTART: C:\Users\SSN\OneDrive - SSN Trust\Documents\SEM 7\IBM\test_cloud_api.py
    Scoring response
    You have high probability to heart Disease Kindly approach a Doctor Take care
>>>
```