**Logo

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**National University of Modern Languages**

**Artificial Intelligence - Lab**

**Assignment # 2**

**BSSE - 5 - Morning**

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**Submitted To:**

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**TASK 1**

**Implement the decision Tree classifier to detect breast cancer.**

**Code:**

import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

from sklearn.model\_selection import train\_test\_split

from sklearn.preprocessing import StandardScaler

data = pd.read\_csv(r'E:\NUML\Semester Data\Semester 5\AI\AI Lab\12093\_Muhammad Umair\_A2\dataR2.csv')

print(data.head())

print("\nCancer data set dimensions : {}".format(data.shape))

x = data.drop('Classification', 'columns')

y = data['Classification']

x\_train, x\_test, y\_train, y\_test = train\_test\_split(x, y, test\_size=0.25, random\_state=5)

scaler = StandardScaler()

scaler.fit(x\_train)

x\_train=scaler.transform(x\_train)

x\_test=scaler.transform(x\_test)

from sklearn.metrics import  confusion\_matrix, classification\_report, accuracy\_score

from sklearn.tree import DecisionTreeClassifier

classifier = DecisionTreeClassifier(criterion= 'entropy', random\_state=0)

classifier.fit(x\_train, y\_train)

y\_pred\_dt = classifier.predict(x\_test)

print('Accuracy: ',accuracy\_score(y\_test, y\_pred\_dt))

cm = confusion\_matrix(y\_test, y\_pred\_dt)

print('Confusion Matrix: \n',cm)

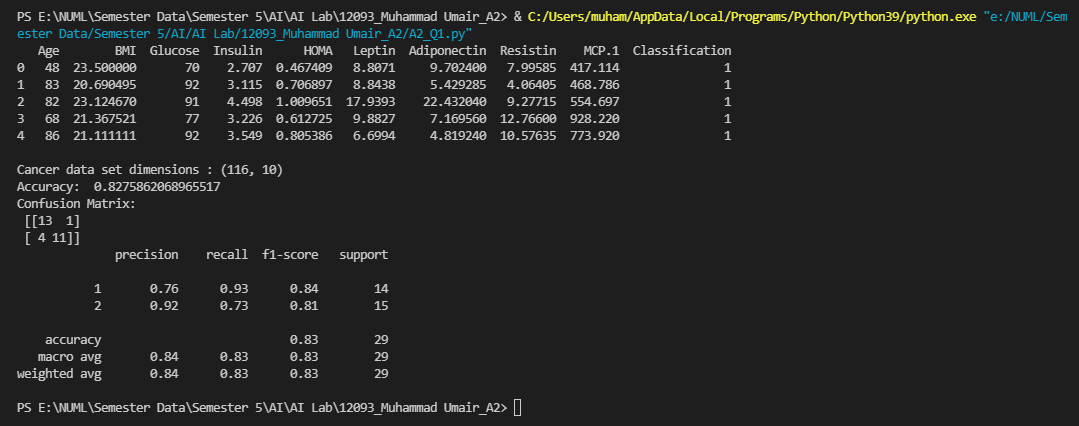
plt.title("Heatmap of Confusion Matrix", fontsize = 15)

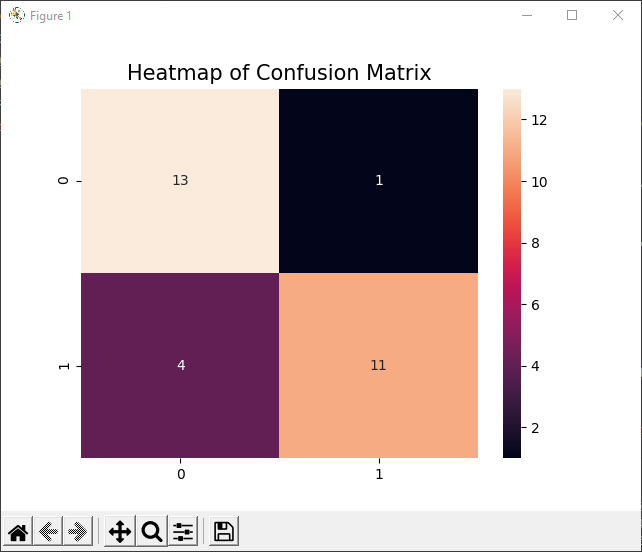
sns.heatmap(cm, annot= True)

plt.show()

print(classification\_report(y\_test, y\_pred\_dt))

**Output:**

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**TASK 2**

**Implement the logistic regression to detect breast cancer. Note: Standardize the data before training the model**

**Code:**

import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

from sklearn.model\_selection import train\_test\_split

from sklearn.preprocessing import StandardScaler

data = pd.read\_csv(r'E:\NUML\Semester Data\Semester 5\AI\AI Lab\12093\_Muhammad Umair\_A2\dataR2.csv')

print(data.head())

print("\nCancer data set dimensions : {}".format(data.shape))

x = data.drop('Classification', 'columns')

y = data['Classification']

x\_train, x\_test, y\_train, y\_test = train\_test\_split(x, y, test\_size=0.25, random\_state=5)

scaler = StandardScaler()

scaler.fit(x\_train)

x\_train=scaler.transform(x\_train)

x\_test=scaler.transform(x\_test)

from sklearn.metrics import  confusion\_matrix, classification\_report, accuracy\_score

from sklearn.linear\_model import LogisticRegression

classifier = LogisticRegression(random\_state = 0)

classifier.fit(x\_train, y\_train)

y\_pred\_lr = classifier.predict(x\_test)

print('Accuracy: ',accuracy\_score(y\_test, y\_pred\_lr))

cm = confusion\_matrix(y\_test, y\_pred\_lr)

print('Confusion Matrix: \n',cm)

plt.title("Heatmap of Confusion Matrix", fontsize = 15)

sns.heatmap(cm, annot= True)

plt.show()

print(classification\_report(y\_test, y\_pred\_lr))

**Output:**

