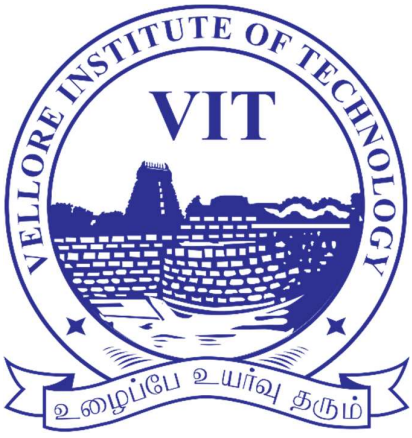


CSE 3024

Web Mining

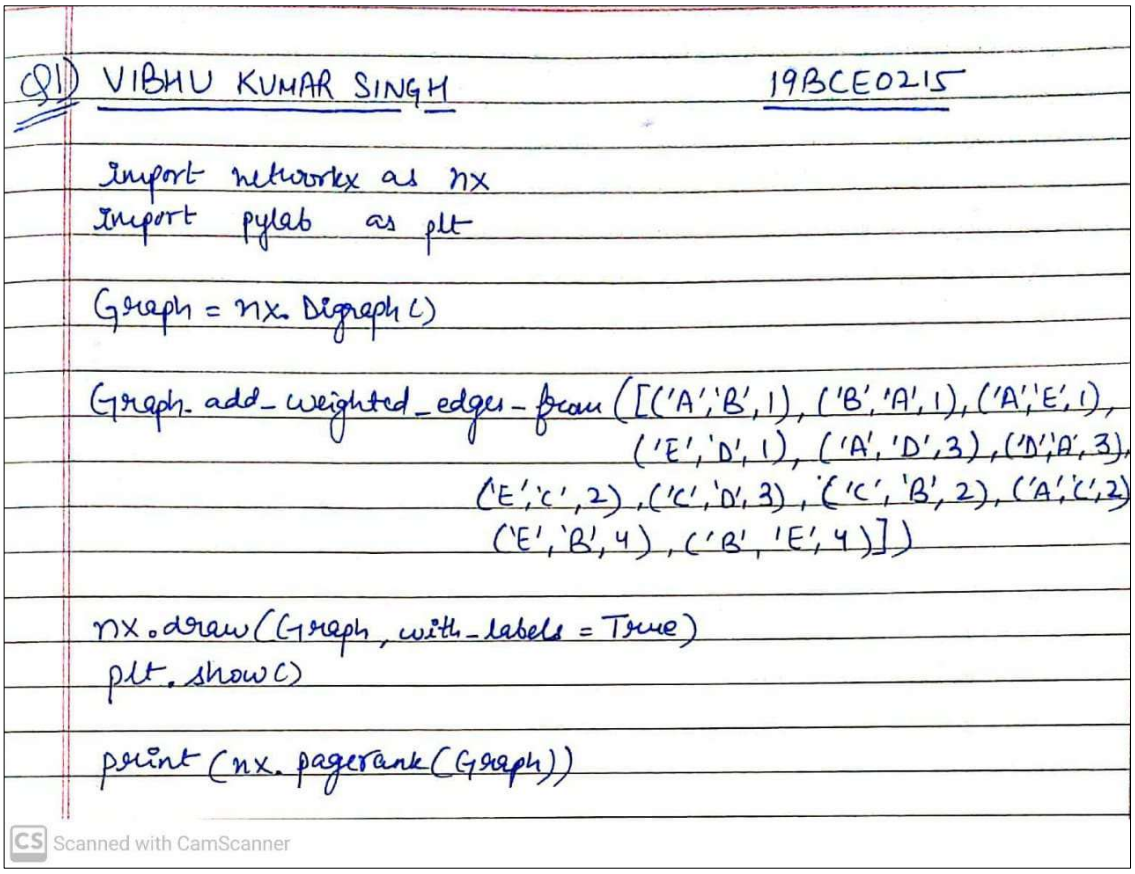
LAB ASSESSMENT - 5

NAME: Vibhu Kumar Singh
REG. NO: 19BCE0215
TEACHER: Mr. Hiteshwar Kumar Azad

1. **Create a Python programme to implement the Page Rank Algorithm in order to plot a graph and print the page rank for each page.**

Ans 1.

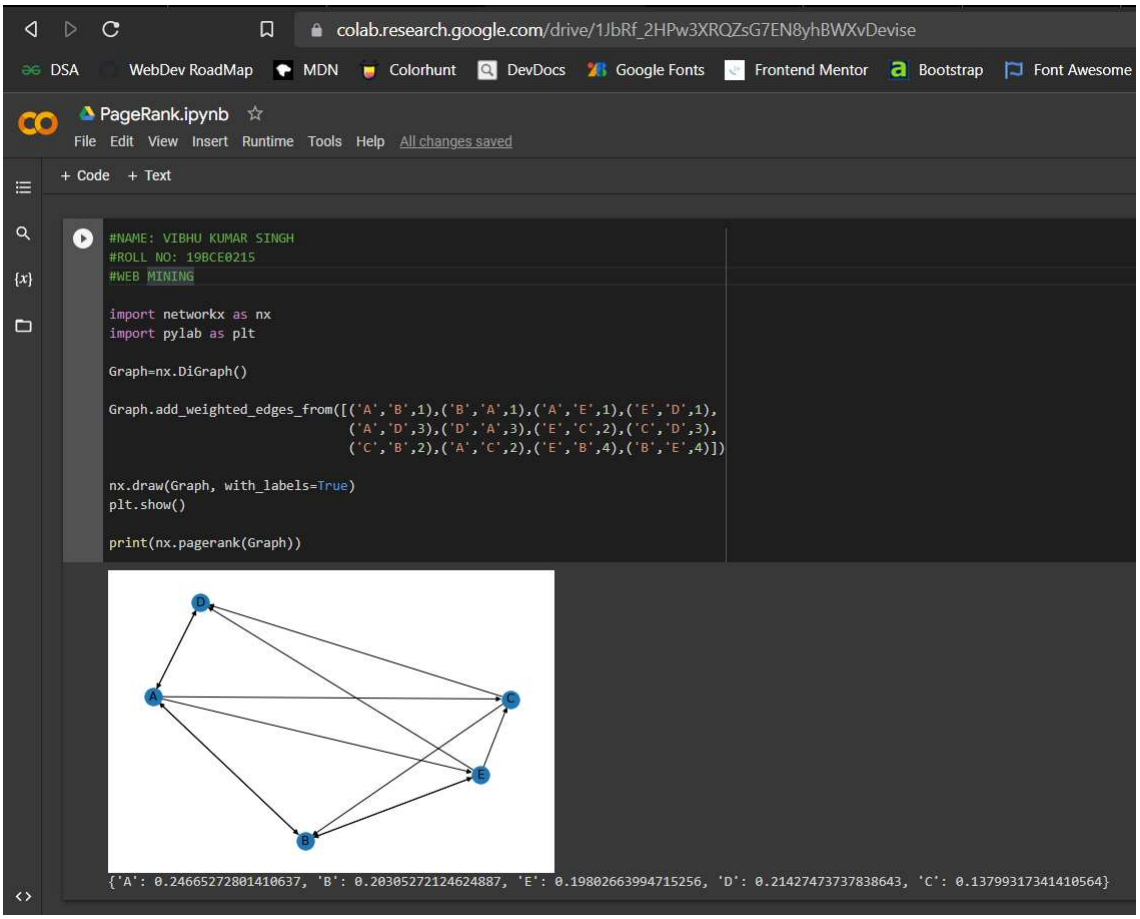
HANDWRITTEN CODE:



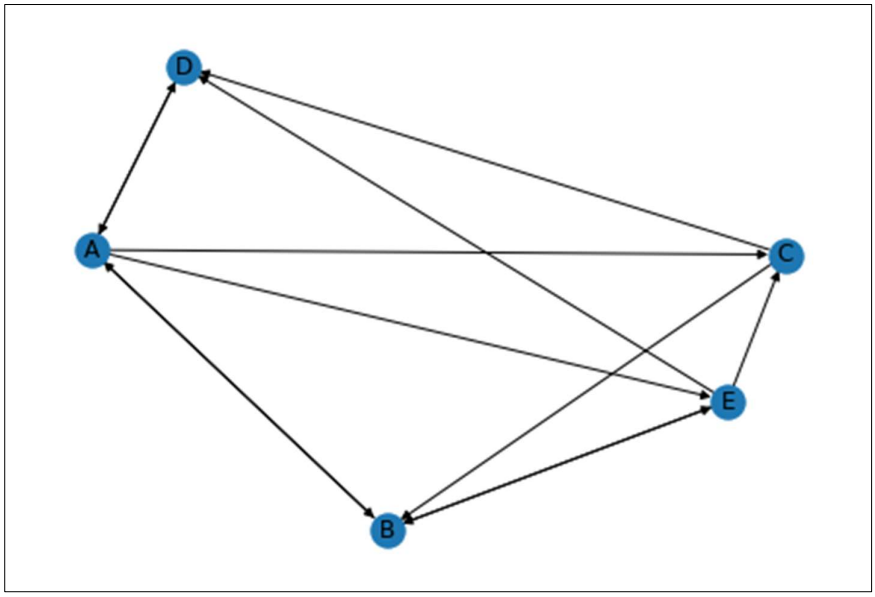
CODE:

```
#NAME: VIBHU KUMAR SINGH
#ROLL NO: 19BCE0215
#WEB MINING

import networkx as nx
import pylab as plt

Graph=nx.DiGraph()

Graph.add_weighted_edges_from([('A','B',1),('B','A',1),('A','E',1),('E','D',1),
                               ('A','D',3),('D','A',3),('E','C',2),('C','D',3),
                               ('C','B',2),('A','C',2),('E','B',4),('B','E',4)])

nx.draw(Graph, with_labels=True)
plt.show()

print(nx.pagerank(Graph))
```

CODE SCREENSHOT:



OUTPUT SCREENSHOT:

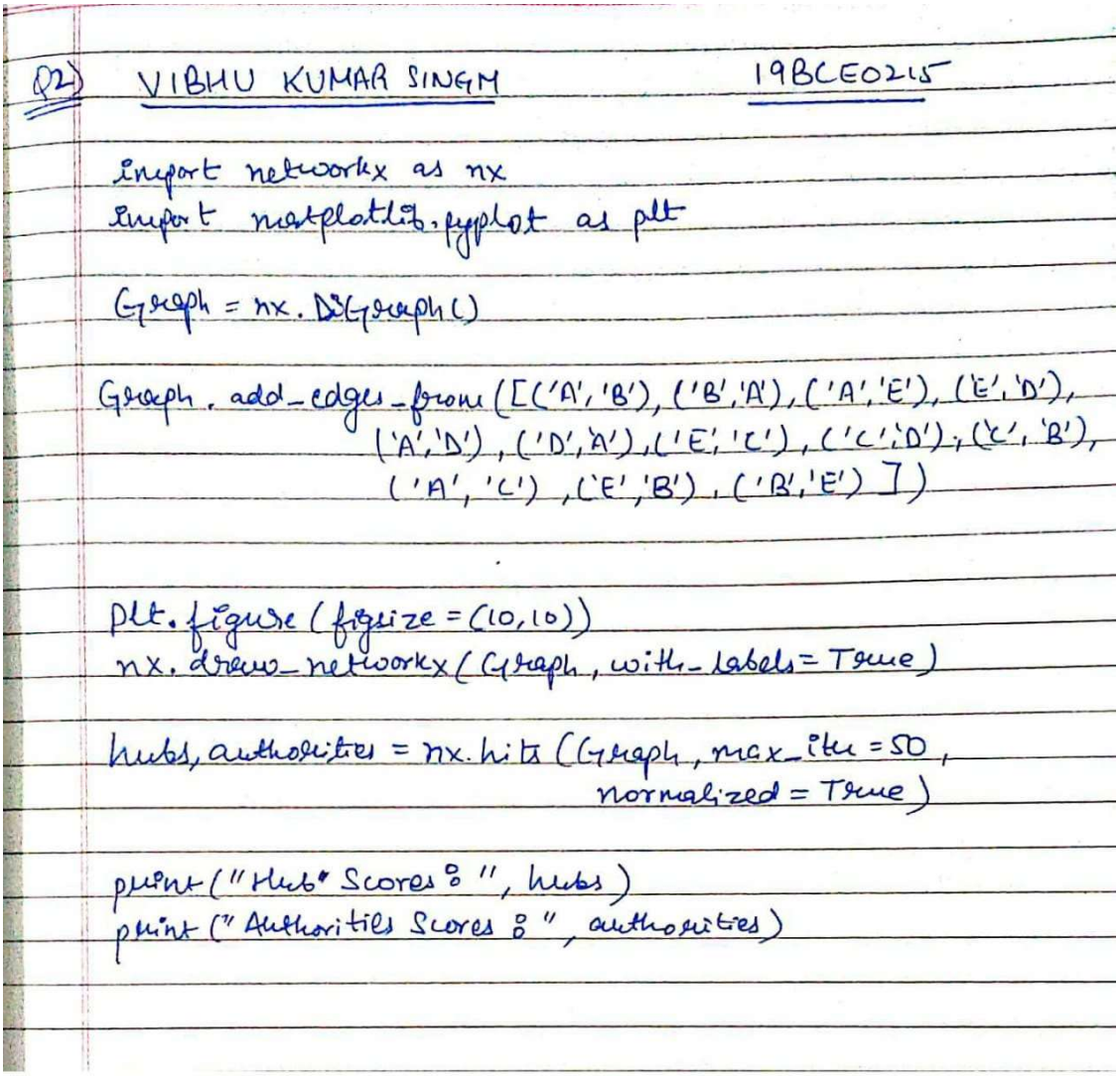


{'A': 0.24665272801410637, 'B': 0.20305272124624887, 'E': 0.19802663994715256, 'D': 0.21427473737838643, 'C': 0.13799317341410564}

2. Create a Python programme that uses the Networkx Module to implement the Hyperlink Induced Topic Search (HITS) Algorithm and prints the Hub and Authority scores.

Ans 2.

HANDWRITTEN CODE:



Q2) VIBHU KUMAR SINGH 19BCE0215

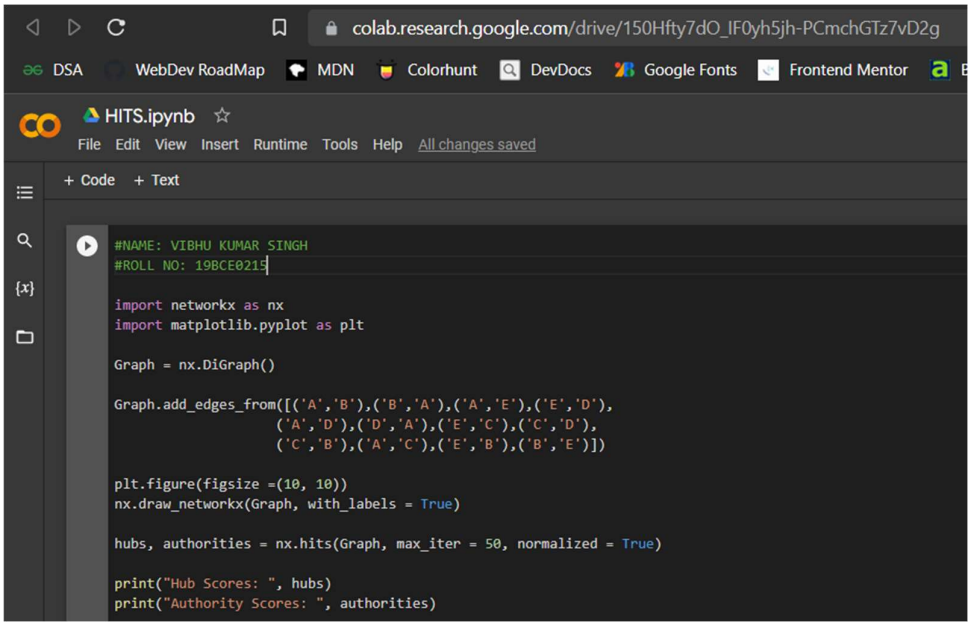
```
import networkx as nx
import matplotlib.pyplot as plt

Graph = nx.DiGraph()

Graph.add_edges_from([('A','B'),('B','A'),('A','E'),('E','D'),
                      ('A','D'),('D','A'),('E','C'),('C','D'),
                      ('C','B'),('A','C'),('E','B'),('B','E')])

plt.figure(figsize=(10,10))
nx.draw_networkx(Graph, with_labels=True)

hubs, authorities = nx.hits(Graph, max_iter=50,
                            normalized=True)

print("Hubs Scores :", hubs)
print("Authorities Scores :", authorities)
```


CODE:

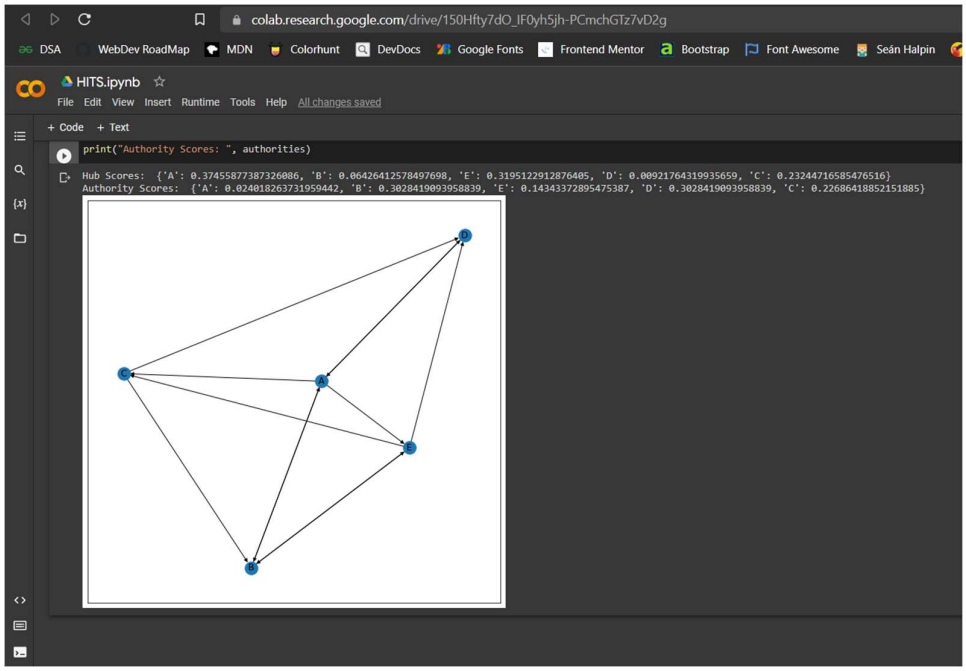
```
#NAME: VIBHU KUMAR SINGH
#ROLL NO: 19BCE0215
#WEB MINING

import networkx as nx
import matplotlib.pyplot as plt

Graph = nx.DiGraph()

Graph.add_edges_from([('A','B'),('B','A'),('A','E'),('E','D'),
                      ('A','D'),('D','A'),('E','C'),('C','D'),
                      ('C','B'),('A','C'),('E','B'),('B','E')])
```

```
plt.figure(figsize =(10, 10))
nx.draw_networkx(Graph, with_labels = True)

hubs, authorities = nx.hits(Graph, max_iter = 50, normalized = True)

print("Hub Scores: ", hubs)
print("Authority Scores: ", authorities)
```

CODE SCREENSHOT:



OUTPUT SCREENSHOT:



Hub Scores: {'A': 0.37455877387326086, 'B': 0.06426412578497698, 'E': 0.3195122912876405, 'D': 0.00921764319935659, 'C': 0.23244716585476516}

Authority Scores: {'A': 0.024018263731959442, 'B': 0.3028419093958839, 'E': 0.14343372895475387, 'D': 0.3028419093958839, 'C': 0.22686418852151885}