Experiment – 10

Title :- Implementation of Page rank/ HITS algorithm

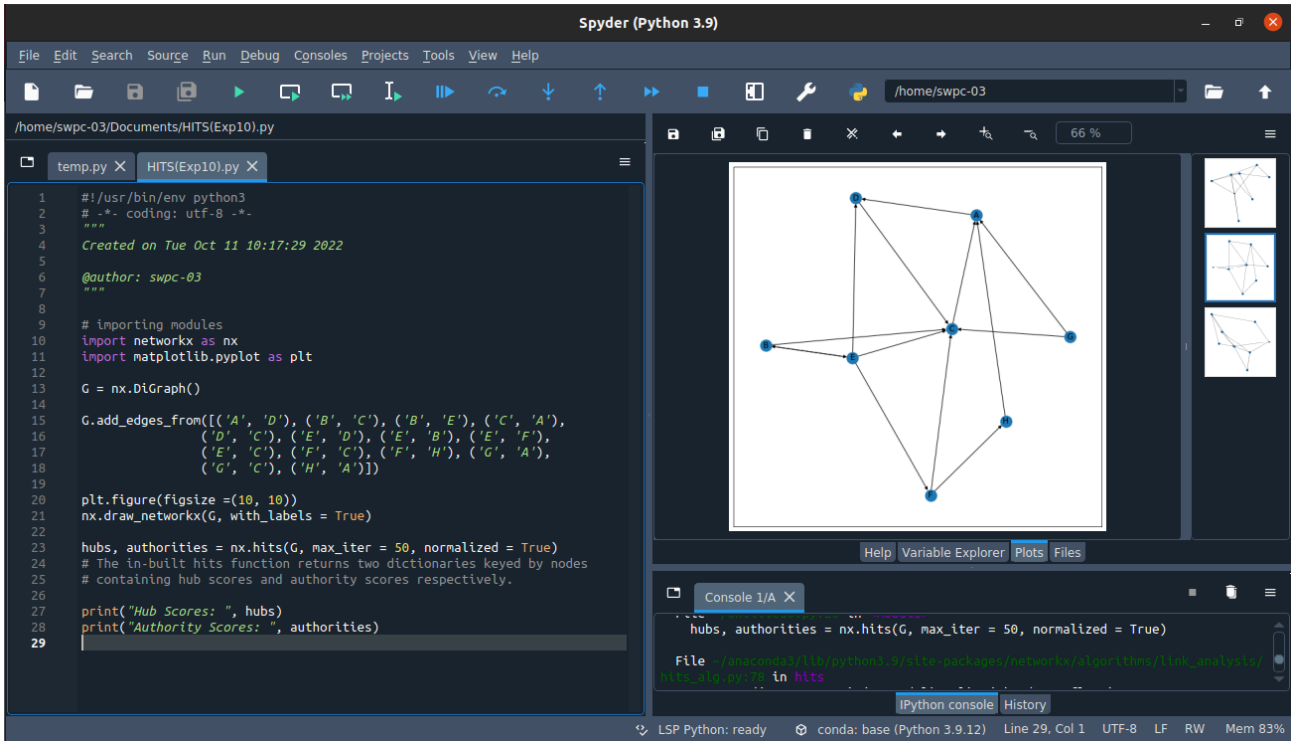
Aim :- To Implement Page rank/ HITS algorithm

Theory :-

Hyperlink Induced Topic Search (HITS) Algorithm is a Link Analysis Algorithm that rates webpages, developed by Jon Kleinberg. This algorithm is used to the web link-structures to discover and rank the webpages relevant for a particular search.
HITS uses hubs and authorities to define a recursive relationship between webpages. Before understanding the HITS Algorithm, we first need to know about Hubs and Authorities.

- Given a query to a Search Engine, the set of highly relevant web pages are called **Roots**. They are potential **Authorities**.
- Pages that are not very relevant but point to pages in the Root are called **Hubs**. Thus, an Authority is a page that many hubs link to whereas a Hub is a page that links to many authorities.

```
# importing modules
import networkx as nx
import matplotlib.pyplot as plt

G = nx.DiGraph()

G.add_edges_from([('A', 'D'), ('B', 'C'), ('B', 'E'), ('C', 'A'),
                                  ('D', 'C'), ('E', 'D'), ('E', 'B'), ('E', 'F'),
                                  ('E', 'C'), ('F', 'C'), ('F', 'H'), ('G', 'A'),
                                  ('G', 'C'), ('H', 'A')])

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

hubs, authorities = nx.hits(G, max_iter = 50, normalized = True)
# The in-built hits function returns two dictionaries keyed by nodes
# containing hub scores and authority scores respectively.

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



Conclusion :-

Thus we have successfully performed the HITS algorithm.