```
!pip install networkx matplotlib
```

```
Requirement already satisfied: networkx in /usr/local/lib/python3.10/dist-packages (3.3)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.10/dist-packages (3.7.1)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (1.3.0)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (4.53.1)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (1.4.5)
Requirement already satisfied: numpy>=1.20 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (1.26.4)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (24.1)
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (9.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (3.1.4)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (2.8.2)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib) (1.16.0)
```

```
!wget https://snap.stanford.edu/data/congress_network.zip
```

```
--2024-09-08 06:53:01--  https://snap.stanford.edu/data/congress_network.zip
Resolving snap.stanford.edu (snap.stanford.edu)... 171.64.75.80
Connecting to snap.stanford.edu (snap.stanford.edu)|171.64.75.80|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 193815 (189K) [application/zip]
Saving to: ‘congress_network.zip’

congress_network.zi 100%[===================>] 189.27K   550KB/s    in 0.3s

2024-09-08 06:53:01 (550 KB/s) - ‘congress_network.zip’ saved [193815/193815]
```

```
!unzip congress_network.zip
```

```
Archive:  congress_network.zip
  inflating: congress_network/compute_vc.py
  inflating: congress_network/congress.edgelist
  inflating: congress_network/congress_network_data.json
  inflating: congress_network/histogram_weights.py
  inflating: congress_network/README.txt
  inflating: congress_network/viral_centrality.py
```

```
import networkx as nx
import matplotlib.pyplot as plt
G = nx.read_edgelist("congress_network/congress.edgelist", delimiter=" ", create_using=nx.Graph(), nodetype=int)
```

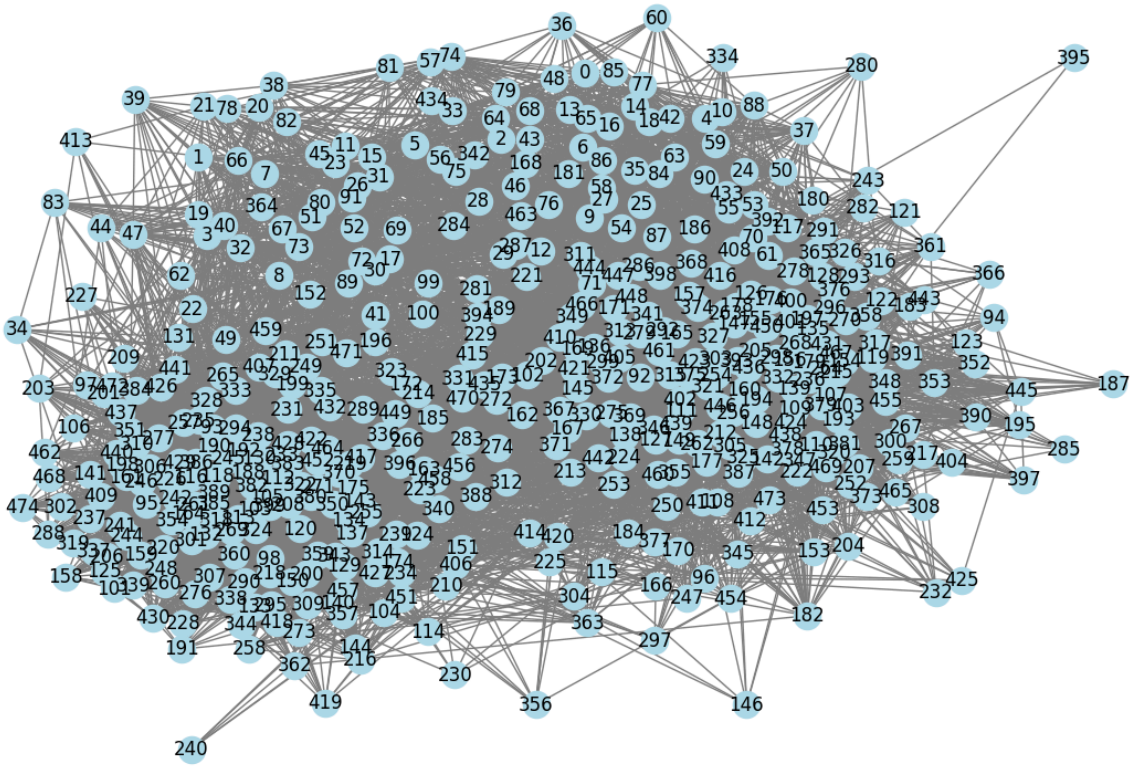
```
print(G.number_of_nodes())
print(G.number_of_edges())
```

```
475
10222
```

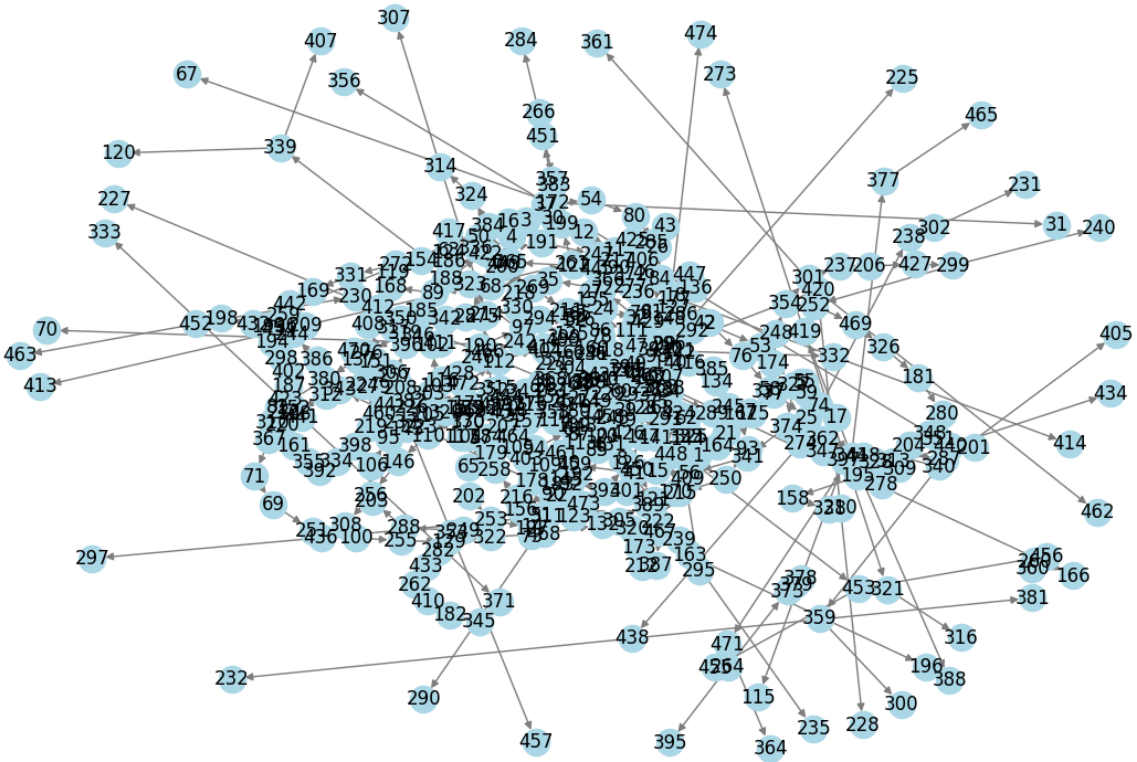
```
# Perform DFS
start_node = list(G.nodes())[0]
```

```
# DFS
dfs_edges = list(nx.dfs_edges(G, source=start_node))
dfs_nodes = list(nx.dfs_tree(G, source=start_node).nodes)

# Visualization
def draw_graph(graph, title):
    plt.figure(figsize=(12, 8))
    pos = nx.spring_layout(graph)
    nx.draw(graph, pos, with_labels=True, node_color='lightblue', edge_color='gray')
    plt.title(title)
    plt.show()

# Draw the graph
draw_graph(G, "Graph Visualization")

# Draw DFS Tree
dfs_tree = nx.dfs_tree(G, source=start_node)
draw_graph(dfs_tree, "DFS Tree Visualization")
```

Graph Visualization



DFS Tree Visualization



Start coding or generate with AI.