Possible Errors/Constraints:

1. All efficient nodes are considered equally efficient.
2. There is only one connection between 2 super-peers.
3. Number of Nodes = 100
4. Maximum number of super-peers = 9

Running Environment: The code is written in python. The visual display of the code is dependent in *Tkinter* module which is part of a standard python module and is available in IDE such as Spyder, PyCharm, etc.

How to execute the code: simply execute the code in any python complier. The GUI will appear and you can use it to perform search connection of node in real network, update the number of super-peers and view the path between source and destination node.

Operations:

1. **View Individual Connection:**
   Input: **ID** of the node or a blank Enter (↵). After providing the ID hit Enter (↵). The ID should be integer and only 1 ID can be provided at a time.
   Output: If ID is provided then all the connection of the node in the real network is shown. If simply enter is pressed then real connection between all the nodes is shown.

2. **Update number of super-peers:**
   Input: *Number of super-peers*. After providing the number hit Enter (↵). The number should be integer.
   Output: The network on the left-hand side will be updated showing the number of super-peers connected with its clients. **An overlay network is shown with super-peer**.

3. **Find Path:**
   Input: Input the node ID of the source and destination node then press Enter (↵). The ID should be integer and only 1 ID can be provided at a time.
   Output: It draws a path from the source node to the destination node. Path in the overlay network is represented with solid blue line and path in the underlying real network is shown with purple dashed line.