CPSC 482
Assignment 3 Part 3

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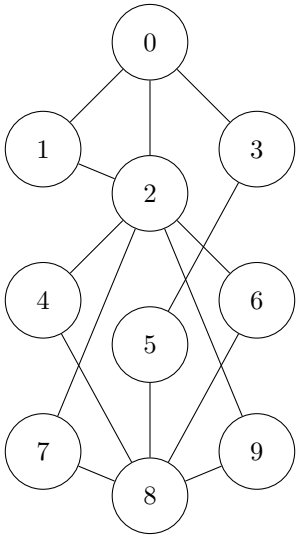
Example 1

Diagram:



Adjacency Matrix:

$$\begin{pmatrix} 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \end{pmatrix}$$

Input (Data File):

Let v = 0 and w = 8...

example1_data.txt

```
1   0, 8
2   0 1 1 1 0 0 0 0 0 0
3   1 0 1 0 0 0 0 0 0 0
4   1 1 0 0 1 0 1 1 0 1
5   1 0 0 0 0 1 0 0 0 0
6   0 0 1 0 0 0 0 0 1 0
7   0 0 0 1 0 0 0 0 1 0
8   0 0 1 0 0 0 0 0 1 0
9   0 0 1 0 0 0 0 0 1 0
10  0 0 0 0 1 1 1 1 0 1
11  0 0 1 0 0 0 0 0 1 0
```

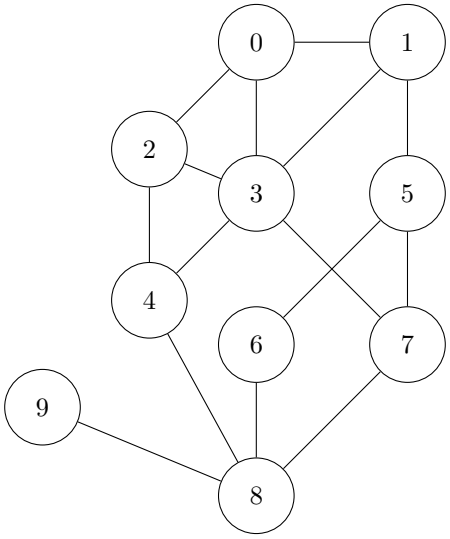
Output:

...the number of shortest paths between v and w is 5 (the length of the shortest path between v and w is 3)

```
PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE                                  1: powershell
PS C:\Users\isayh\Documents\School Documents\CPSC 482\assignment3> python assignment3_part2_CPSC482_isayharaposo.py example1_data.txt
1st argument detected.
Finding file...
File found.
Length of shortest path between node 0 and node 8: 3
Number of shortest paths between node 0 and node 8: 5
PS C:\Users\isayh\Documents\School Documents\CPSC 482\assignment3>
```

Example 2

Diagram



Adjacency Matrix:

$$\begin{pmatrix} 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \end{pmatrix}$$

Input (Data File):

Let v = 0 and w = 9...

example2_data.txt

```
1   0, 9
2   0 1 1 1 0 0 0 0 0 0
3   1 0 0 1 0 1 0 0 0 0
4   1 0 0 1 1 0 0 0 0 0
5   1 1 1 0 1 0 0 1 0 0
6   0 0 1 1 0 0 0 0 1 0
7   0 1 0 0 0 0 1 1 0 0
8   0 0 0 0 0 1 0 0 1 0
9   0 0 0 1 0 1 0 0 1 0
10  0 0 0 0 1 0 1 1 0 1
11  0 0 0 0 0 0 0 0 1 0
```

Output:

...the number of shortest paths between v and w is 3 (the length of the shortest path between v and w is 4)

```
PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE                                  1: powershell
PS C:\Users\isayh\Documents\School Documents\CPSC 482\assignment3> python assignment3_part2_CPSC482_isayharaposo.py example2_data.txt
1st argument detected.
Finding file...
File found.
Length of shortest path between node 0 and node 9: 4
Number of shortest paths between node 0 and node 9: 3
PS C:\Users\isayh\Documents\School Documents\CPSC 482\assignment3>
```