Report

Project 1: Savvy Traveler

Group Members

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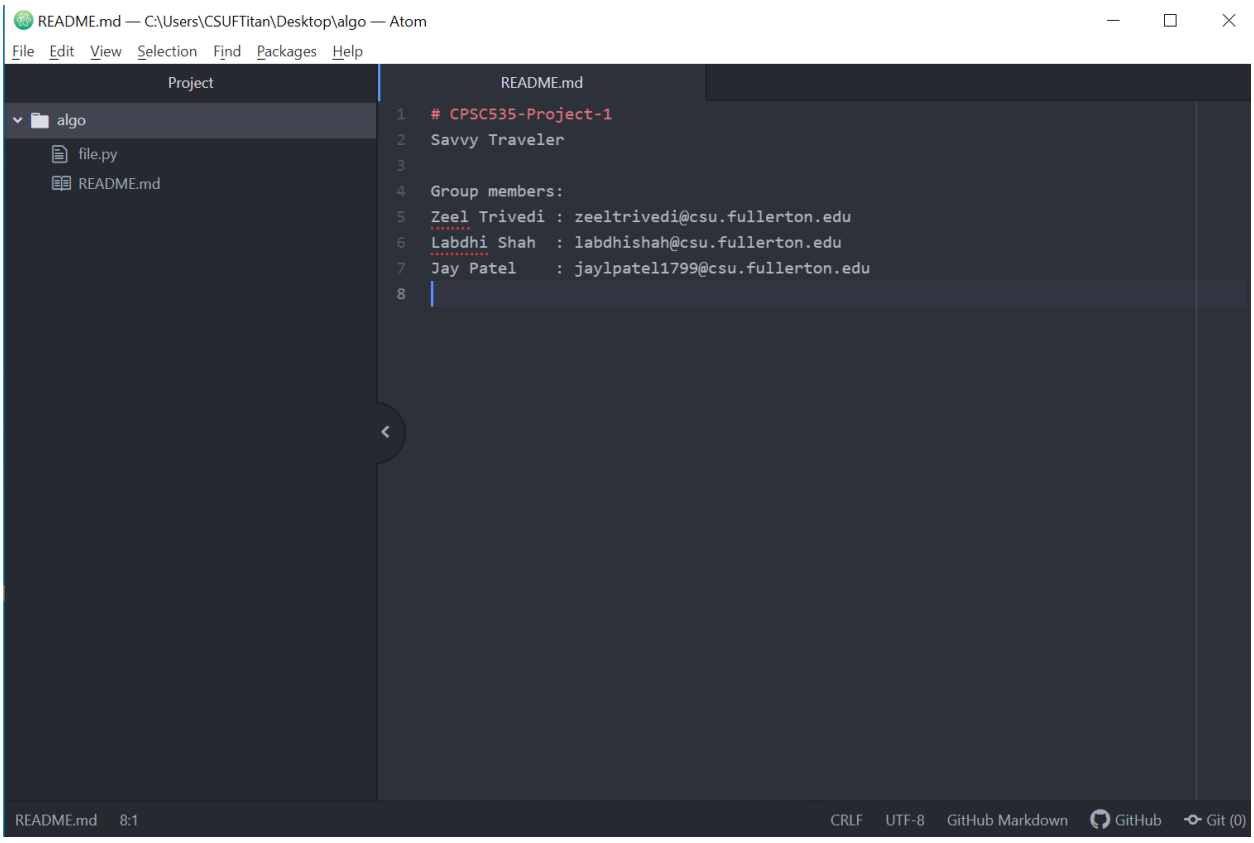


Pseudocode description:

Z = 8 #number of nodes

I,j,k used in for loop to visit the each node

x,y source and destination node

MIN_PROBABILITY = 0   #to store the minimum probability of particular node

maps = ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H'] # nodes name

Pseudocode for the given problems:

```
# project function to find the maximum  distance between the source and destination node.
def project(graph,direction):
   solve = list(map(lambda i: list(map(lambda j: j, i)), graph))
    path = list(map(lambda i: list(map(lambda j: j, i)), direction))
    for k in range(Z):
        for i in range(Z):
            for j in range(Z):
                if solve[i][j]<solve[i][k] * solve[k][j]:
                    path[i][j] =  path[i][k] + path[k][j]:

 ## to select the maximum distance between the two nodes via using the junction
            solve[i][j] = max(solve[i][j], solve[i][k] * solve[k][j])

## to find the maximum probability of a city
    maxProb = 0       ## initializing the maximum probability to 0
    ans = ' '                  ## to store the final answer and initialized it as NULL
    for i in range(Z):
        tmp = 1  ## tmp variable to store the probability of a city
```

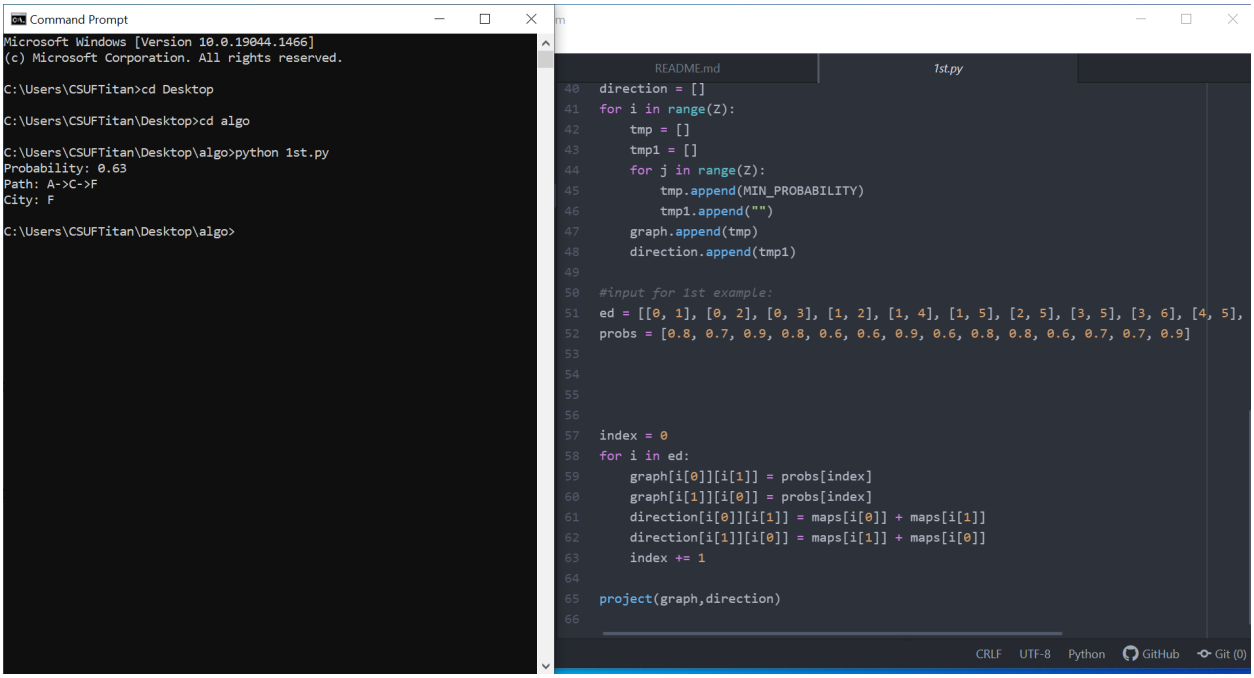
```
        for j in range(Z):
            tmp *= solve[i][j]
        if tmp > maxProb:    ## compare tmp* with maxProb, and print the maximum
            maxProb = tmp       ## select that path which has the maximum value
            ans = i
    print("Probability:", solve[x][y])
    print("Path:", "->".join(list(path[x][y])))
    print("City:",maps[ans])
graph = []
direction = []
for i in range(Z):
    tmp = []
    tmp1 = []
    for j in range(Z):
        tmp.append(MIN_PROBABILITY)
        tmp1.append("")
    graph.append(tmp)
    direction.append(tmp1)


##explicitly describing the edges with values
##ed = [[0, 1], [0, 2], [0, 3], [1, 2], [1, 4], [1, 5], [2, 5], [3, 5], [3, 6], [4, 5], [4, 7], [5, 6], [5, 7], [6, 7]]
##probs = [0.8, 0.7, 0.9, 0.8, 0.6, 0.6, 0.9, 0.6, 0.8, 0.8, 0.6, 0.7, 0.7, 0.9]
    direction[i[0]][i[1]] = maps[i[x]] + maps[i[y]]
    index += 1
project(graph,direction)
```

Brief Description on how to run the code:

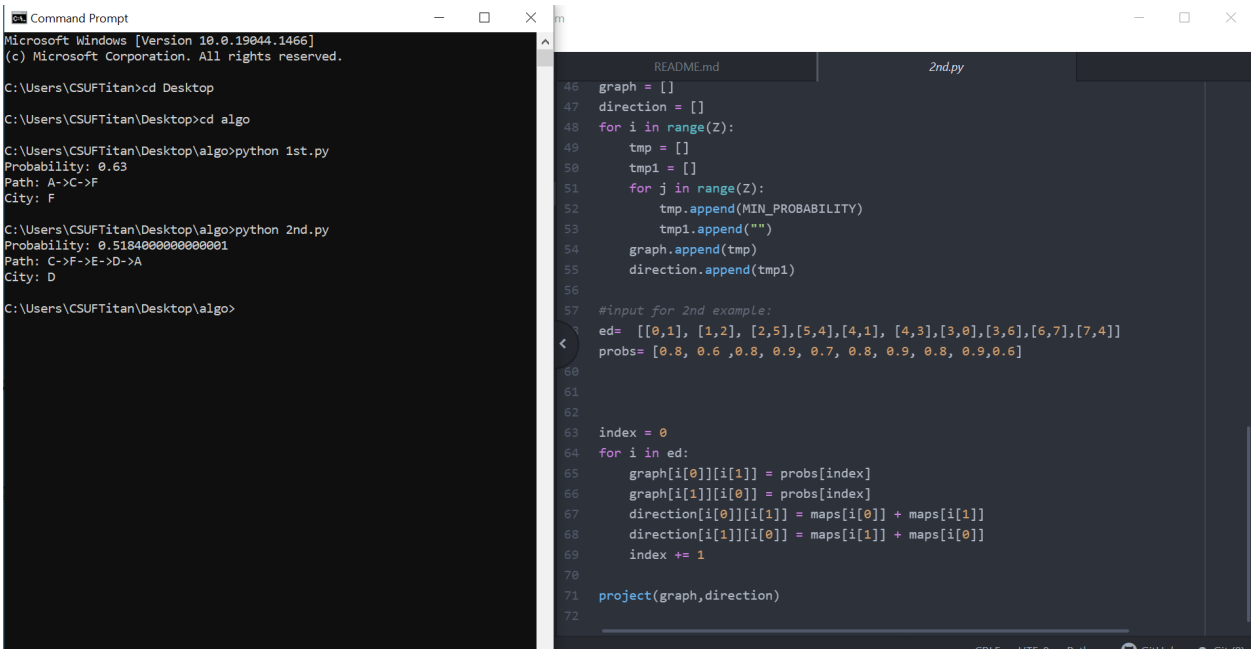
1) In the given code user must change vertices and probability as per the graph.
2) There is three programs with different inputs for given graph with their probability as below:
   Input 1: ed = [[0, 1], [0, 2], [0, 3], [1, 2], [1, 4], [1, 5], [2, 5], [3, 5], [3, 6], [4, 5], [4, 7], [5, 6], [5, 7], [6, 7]]
   prob = [0.8, 0.7, 0.9, 0.8, 0.6, 0.6, 0.9, 0.6, 0.8, 0.8, 0.6, 0.7, 0.7, 0.9]
   Input 2: ed= [[0,1], [1,2], [2,5],[5,4],[4,1], [4,3],[3,0],[3,6],[6,7],[7,4]]
   probs= [0.8, 0.6 ,0.8, 0.9, 0.7, 0.8, 0.9, 0.8, 0.9,0.6]
   Input 3: ed= [[0,1],[1,2],[2,3],[3,0],[0,4],[4,5],[5,6],[6,7],[7,4],[7,3],[6,2],[5,1]]
   probs= [0.8,0.6,0.9,0.9,0.8,0.6,0.9,0.6,0.8,0.7,0.6,0.7]
3) After giving required inputs user should run the code.

Results:

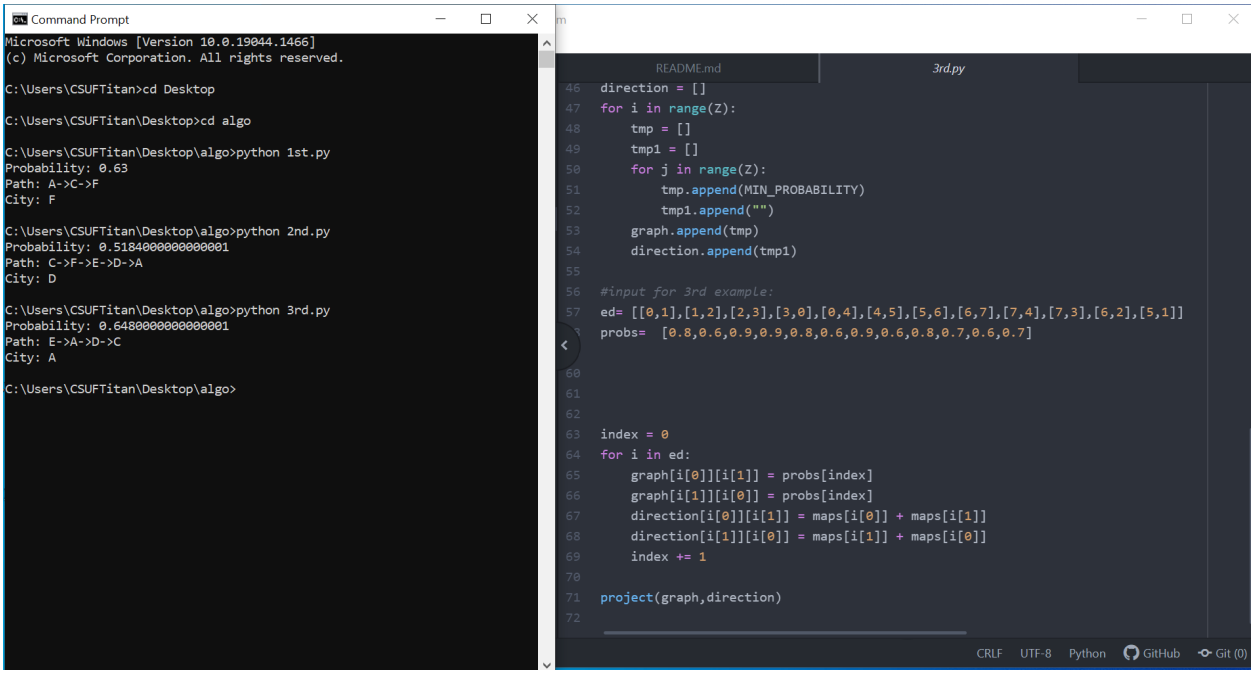
Example 1



Example 2:


Command Prompt
Microsoft Windows [Version 10.0.19044.1466]
(c) Microsoft Corporation. All rights reserved.
C:\Users\CSUFTitan>cd Desktop
C:\Users\CSUFTitan\Desktop>cd algo
C:\Users\CSUFTitan\Desktop\algo>python 1st.py
Probability: 0.63
Path: A->C->F
City: F
C:\Users\CSUFTitan\Desktop\algo>python 2nd.py
Probability: 0.5184000000000001
Path: C->F->E->D->A
City: D
C:\Users\CSUFTitan\Desktop\algo>
README.md
2nd.py
graph = []
direction = []
for i in range(Z):
tmp = []
tmp1 = []
for j in range(Z):
tmp.append(MIN_PROBABILITY)
tmp1.append("")
graph.append(tmp)
direction.append(tmp1)
#input for 2nd example:
ed= [[0,1], [1,2], [2,5],[5,4],[4,1], [4,3],[3,0],[3,6],[6,7],[7,4]]
probs= [0.8, 0.6 ,0.8, 0.9, 0.7, 0.8, 0.9, 0.8, 0.9,0.6]
index = 0
for i in ed:
graph[i[0]][i[1]] = probs[index]
graph[i[1]][i[0]] = probs[index]
direction[i[0]][i[1]] = maps[i[0]] + maps[i[1]]
direction[i[1]][i[0]] = maps[i[1]] + maps[i[0]]
index += 1
project(graph,direction)

Example 3


Command Prompt
Microsoft Windows [Version 10.0.19044.1466]
(c) Microsoft Corporation. All rights reserved.
C:\Users\CSUFTitan>cd Desktop
C:\Users\CSUFTitan\Desktop>cd algo
C:\Users\CSUFTitan\Desktop\algo>python 1st.py
Probability: 0.63
Path: A->C->F
City: F
C:\Users\CSUFTitan\Desktop\algo>python 2nd.py
Probability: 0.5184000000000001
Path: C->F->E->D->A
City: D
C:\Users\CSUFTitan\Desktop\algo>python 3rd.py
Probability: 0.6480000000000001
Path: E->A->D->C
City: A
C:\Users\CSUFTitan\Desktop\algo>
README.md
3rd.py
direction = []
for i in range(Z):
tmp = []
tmp1 = []
for j in range(Z):
tmp.append(MIN_PROBABILITY)
tmp1.append("")
graph.append(tmp)
direction.append(tmp1)
#input for 3rd example:
ed= [[0,1],[1,2],[2,3],[3,0],[0,4],[4,5],[5,6],[6,7],[7,4],[7,3],[6,2],[5,1]]
probs= [0.8,0.6,0.9,0.9,0.8,0.6,0.9,0.6,0.8,0.7,0.6,0.7]
index = 0
for i in ed:
graph[i[0]][i[1]] = probs[index]
graph[i[1]][i[0]] = probs[index]
direction[i[0]][i[1]] = maps[i[0]] + maps[i[1]]
direction[i[1]][i[0]] = maps[i[1]] + maps[i[0]]
index += 1
project(graph,direction)
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Git (0)