***Assignment #01***

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**COURSE: Discrete Maths**

**Question:**

from collections import defaultdict

class Graph:

def \_\_init\_\_(self,vertices):

self.V= vertices

self.graph= defaultdict(list)

self.tc = [[0 for j in range(self.V)] for i in range(self.V)]

def addEdge(self,u,v):

self.graph[u].append(v)

def DFSUtil(self,s,visited, matrix):

visited[s] = True

for c in self.graph[s]:

matrix[s][c] = 1

if visited[c] == False:

self.DFSUtil(c, visited, matrix)

elif visited[c] == True:

for i in range(self.V):

if matrix[s][i] == 1:

matrix[c][i] = 1

for i in range(self.V):

if matrix[c][i] == 1:

matrix[s][i] = 1

return

def transitiveClosure(self):

matrix = [[0 for j in range(self.V)] for i in range(self.V)]

visited = [False]\*self.V

for v in self.graph.keys():

if visited[v] == False:

self.DFSUtil(v, visited, matrix)

return matrix

g = Graph(4)

g.addEdge(0, 1)

g.addEdge(0, 2)

g.addEdge(1, 2)

g.addEdge(2, 0)

g.addEdge(2, 3)

g.addEdge(3, 3)

print ("Transitive closure matrix is")

print (g.transitiveClosure());

**Output:**

