AI LAB

19F-0151

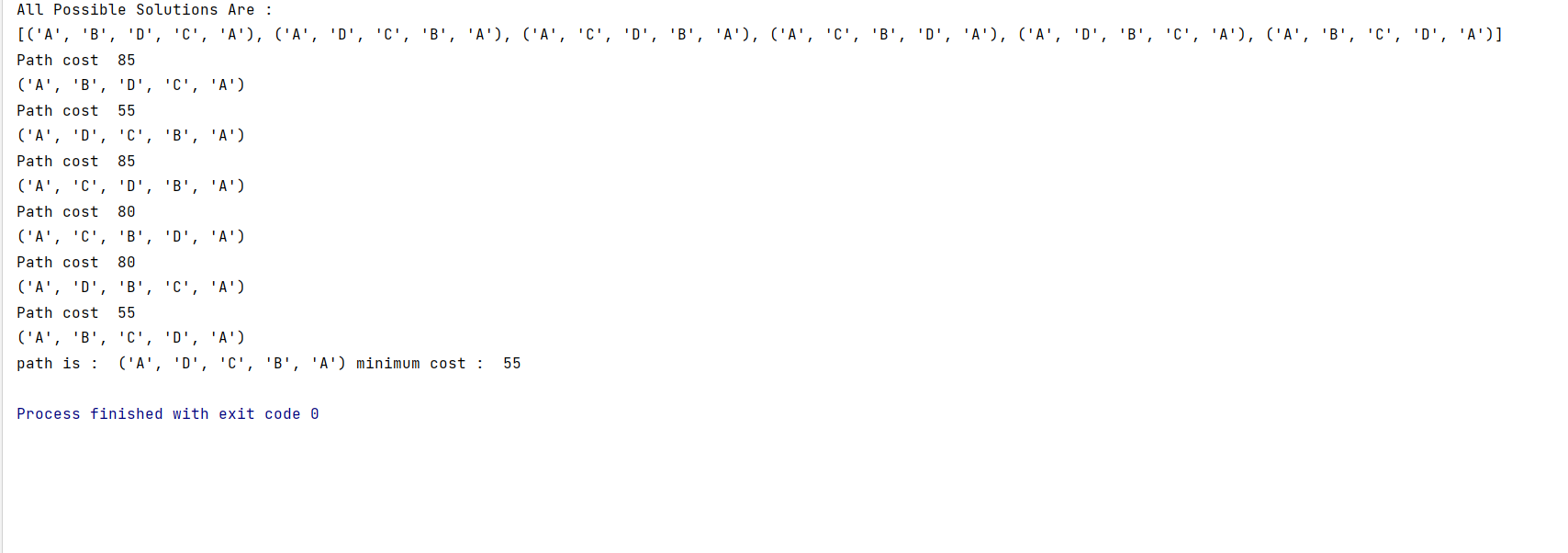
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**Task:**

from collections import defaultdict  
from itertools import permutations  
  
class Graph:  
  
 def \_\_init\_\_(self):  
 self.graph = defaultdict(list)  
  
 def addEdge(self, u, v):  
 self.graph[u].append(v)  
  
 def printGraph(self):  
 print(self.graph)  
  
 def findactualpathvalue(self, path,costValue):  
 sum = 0  
 str = ""  
 for i in path:  
 str += i  
 j = 2  
 for x in range(0, len(path) - 1):  
 sl = slice(x, j, 1)  
 t = str[sl]  
 weight = costValue[t]  
 sum += weight  
 j = j + 1  
 print("Path cost ",sum)  
 print(path)  
 return sum  
 def generateallsol(self):  
 li = list(self.graph.keys())[:]  
 li.extend(['A'])  
 sol = [x for x in set(permutations(li)) if x[0] == 'A' and x[-1] == 'A']  
 print("All Possible Solutions Are :")  
 print(sol)  
 return sol  
 def hillclimbing(self, current):  
 current1 = current[0]  
 per= 0  
 for i in range(1, len(current)):  
 if current1 >= current[i]:  
 current1 = current[i]  
 per = i  
 else:  
 break  
 return current1,per  
*# Driver code*g = Graph()  
  
g.addEdge('A', 'B')  
g.addEdge('A', 'C')  
g.addEdge('A', 'D')  
g.addEdge('B', 'A')  
g.addEdge('B', 'C')  
g.addEdge('B', 'D')  
g.addEdge('C', 'A')  
g.addEdge('C', 'B')  
g.addEdge('C', 'D')  
g.addEdge('D', 'A')  
g.addEdge('D', 'B')  
g.addEdge('D', 'C')  
  
actualvalues = \  
 {'AB': 25,  
 'AD': 15,  
 'BD': 45,  
 'BC': 10,  
 'CD': 5,  
 'AC': 10,  
 'BA': 25,  
 'DA': 15,  
 'DB': 45,  
 'CB': 10,  
 'DC': 5,  
 'CA': 10,  
 }  
  
g.printGraph()  
cost = []  
path = g.generateallsol()  
for i in range(0,len(path)):  
 cost1=g.findactualpathvalue(path[i],actualvalues)  
 cost.append(cost1)  
  
curr,p = g.hillclimbing(cost)  
print("path is : " , path[p], "minimum cost : ", curr)

**Output:**



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