Group-5

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**1) Design and implement a python program for Travelling Salesman Problem.**

from sys import maxsize

from itertools import permutations

def travellingSalesmanProblem(graph, s):

vertex = []

for i in range(n):

if i != s:

vertex.append(i)

min\_path = maxsize

next\_permutation=permutations(vertex)

for i in next\_permutation:

current\_pathweight = 0

k = s

for j in i:

current\_pathweight += graph[k][j]

k = j

current\_pathweight += graph[k][s]

min\_path = min(min\_path, current\_pathweight)

return min\_path

n=int(input("Enter the value of n ="))

print("Enter the distance between cities")

graph = []

for i in range(n):

a=[]

for j in range(n):

a.append(int(input()))

graph.append(a)

print("The distance between cities in the form of matrix")

for i in range(n):

for j in range(n):

print(graph[i][j],end=" ")

print()

s = 0

print("The minimum distance required to visit all cities is=",travellingSalesmanProblem(graph, s))

**Output:**

