EXPERIMENT:09 Write the python to implement Travelling Salesman Problem

PROGRAM:

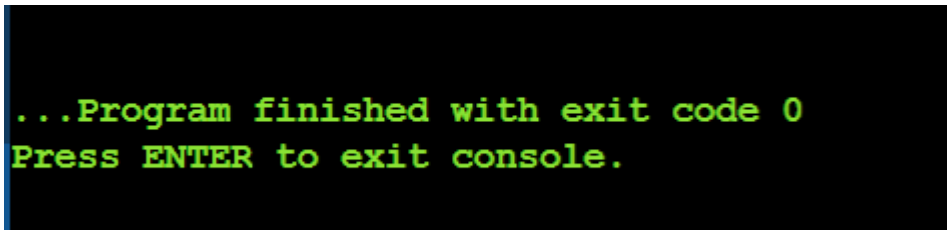
```
import itertools


def total_distance(route, dist_matrix):
    distance = 0
    for i in range(len(route) - 1):
        distance += dist_matrix[route[i]][route[i+1]]
    distance += dist_matrix[route[-1]][route[0]]  # Return to start
    return distance


def tsp(dist_matrix):
    n = len(dist_matrix)
    cities = list(range(n))
    shortest = None
    min_dist = float('inf')

    for perm in itertools.permutations(cities[1:]):  # Fix city 0 as start
        route = [0] + list(perm)
        dist = total_distance(route, dist_matrix)
        if dist < min_dist:
            min_dist = dist
            shortest = route
    return shortest, min_dist_
```

OUTPUT:


...Program finished with exit code 0
Press ENTER to exit console.