




25-09-2021

ARTIFICIAL INTELLIGENCE
PRACTICAL 9
ROLL No. 2109805

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CLASS: TYBSc CS
ROLL No: 2109805
SUBJECT: ARTIFICIAL INTELLIGENCE



Practical 9: Travelling Salesman Problem

Q1) Demonstrate Travelling Salesman Problem

Ans:

```
"""
```

```
p8_travelling_salesman.py
```

```
Author: Jagrut Gala
```

```
Date: 04-09-2021
```

```
Practical: 8
```

```
Objective: Demonstrate Travelling Salesman Problem.
```

```
"""
```

```
# Python3 program to implement traveling salesman
```

```
# problem using naive approach.
```

```
from sys import maxsize
```

```
from itertools import permutations
```

```
V = 4
```

```
# implementation of traveling Salesman Problem
```

```
def travellingSalesmanProblem(graph, s):
```

```
# store all vertex apart from source vertex
```

```
    vertex = []
```

```
    for i in range(V):
```

```
        if(i == s): continue
```

```
        vertex.append(i)
```

```
# store minimum weight Hamiltonian Cycle
```

```
min_path = maxsize
```

```
next_permutation=permutations(vertex)
```

```
for i in next_permutation:
```

```
    current_pathweight = 0 # store current Path weight(cost)
```

```
    k = s # compute current path weight
```

```
    for j in i:
```

```
        current_pathweight += graph[k][j]
```

```
        k = j
```

```
    current_pathweight += graph[k][s]
```

```
    min_path = min(min_path, current_pathweight) # update minimum
```

```
return min_path
```

```
# Driver Code
```

```
if __name__ == "__main__":
```

```
    # matrix representation of graph
```

```
    graph = [
```

```
        [0, 10, 15, 20],
```

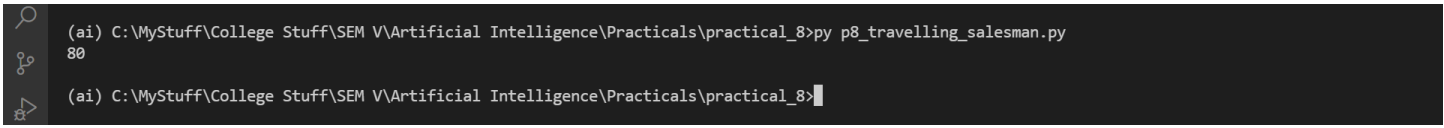
```
        [10, 0, 35, 25],
```

```
        [15, 35, 0, 30],
```

```
        [20, 25, 30, 0],
```

```
    ]
```

```
s = 0  
print(travellingSalesmanProblem(graph, s))
```

A terminal window with a dark background and light gray text. On the left side, there is a vertical toolbar with icons for search, undo, redo, and a terminal icon. The terminal shows two lines of text: the first line is a command prompt followed by a file path and a file name, and the second line is the output of the command.

```
(ai) C:\MyStuff\College Stuff\SEM V\Artificial Intelligence\Practicals\practical_8>py p8_travelling_salesman.py  
80  
(ai) C:\MyStuff\College Stuff\SEM V\Artificial Intelligence\Practicals\practical_8>
```