DATA: 17/01/2022 EXP No: 02	Title of the Lab AGENTS AND REAL - WORLDPROBLEMS	Name:Avinash reddy Vasipalli Registration Number: RA1911027010007 Section: N1 Lab Batch: 1 Day Order: 2

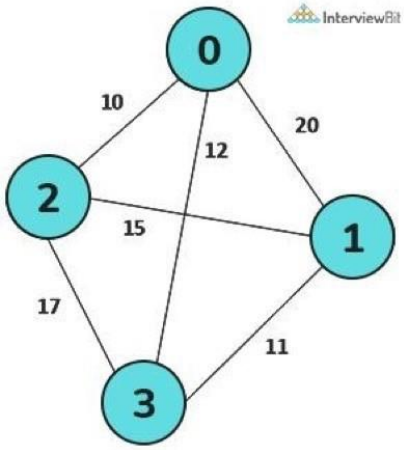
Travelling Salesman Problem

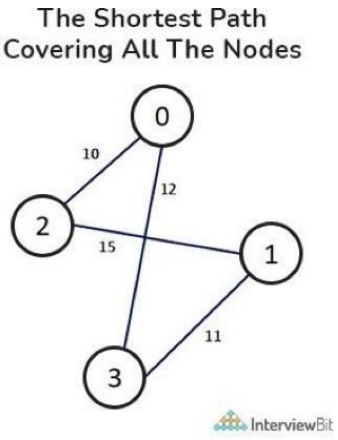
AIM: To Implement Travelling Salesman Problem using python.

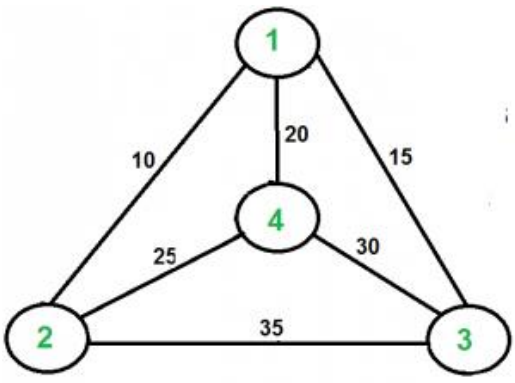
Description of the concept or Problem given

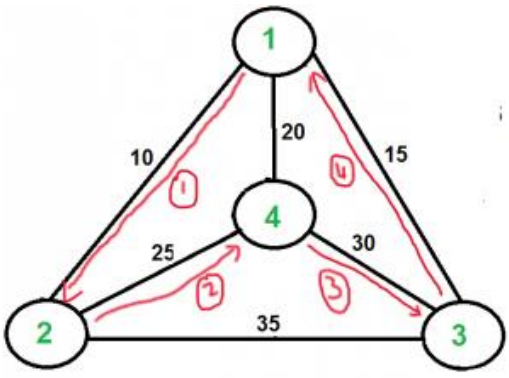
Given set of cities and distance between every pair of cities. The problem is to find shortest possible route that can visit every city exactly once and return to the starting point.

Manual Solution









Problem 1

	0	1	2	3
0	0	20	10	12
1	20	0	15	11
2	10	15	0	17
3	12	11	17	0

Problem 2

	1	2	3	4
1	0	10	15	20
2	10	0	35	25
3	15	35	0	30
4	20	25	30	0

For the 2 problems

From Problem 1

From node 0 the shortest distance is 10, so move to node 2.

From node 2 the shortest distance is 15, so move to node 1.

From node 1 the shortest distance is 11, so move to node 3.

From node 3 the shortest distance is 12, so move back to node 0.

So, the shortest distance route would be 10+15+11+12 = 48

From Problem 2

From node 1 the shortest distance is 10, so move to node 2.

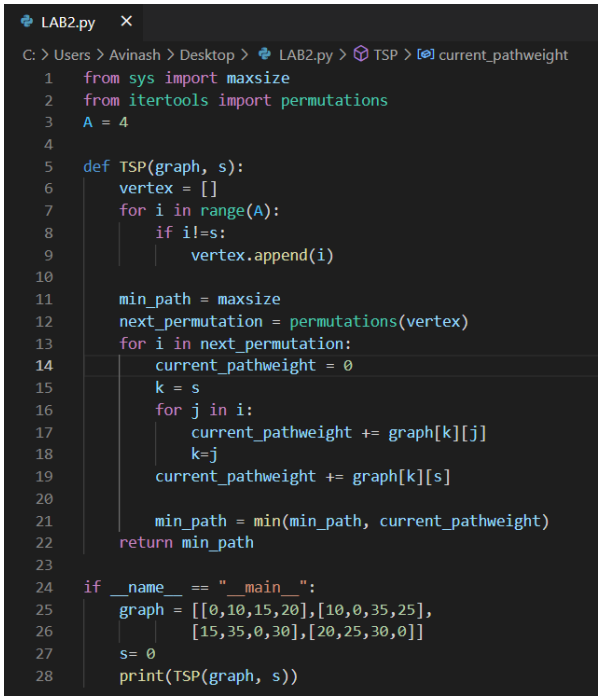
From node 2 the shortest distance is 25, so move to node 4.

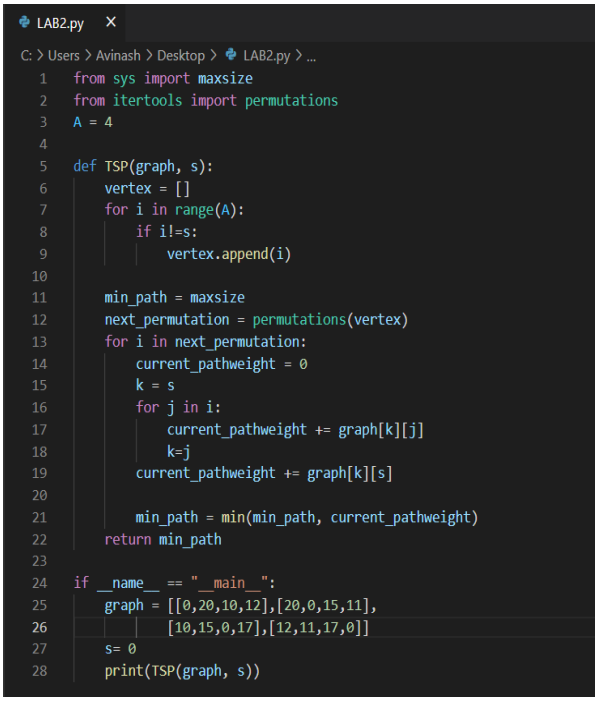
From node 4 the shortest distance is 30, so move to node 3.

From node 3 the shortest distance is 15, so move back to node 1.

So, the shortest distance route would be 10+25+30+15 = 80

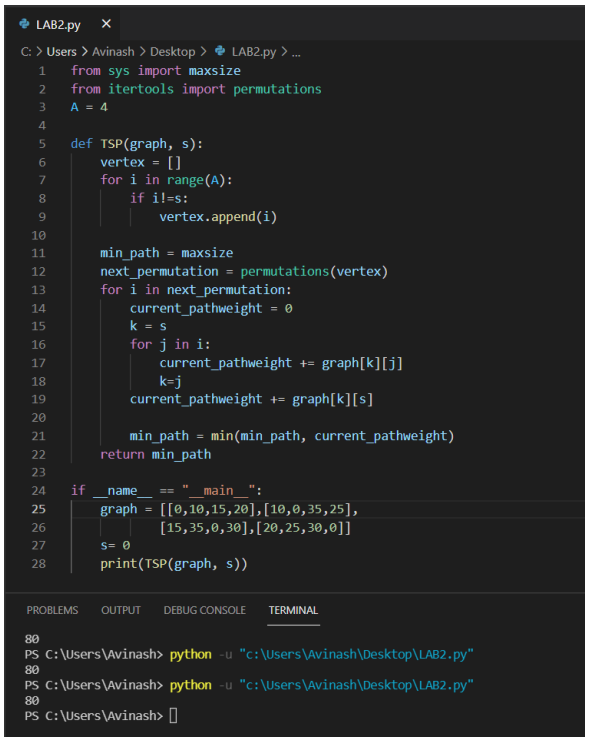
Program Implementation [Coding]

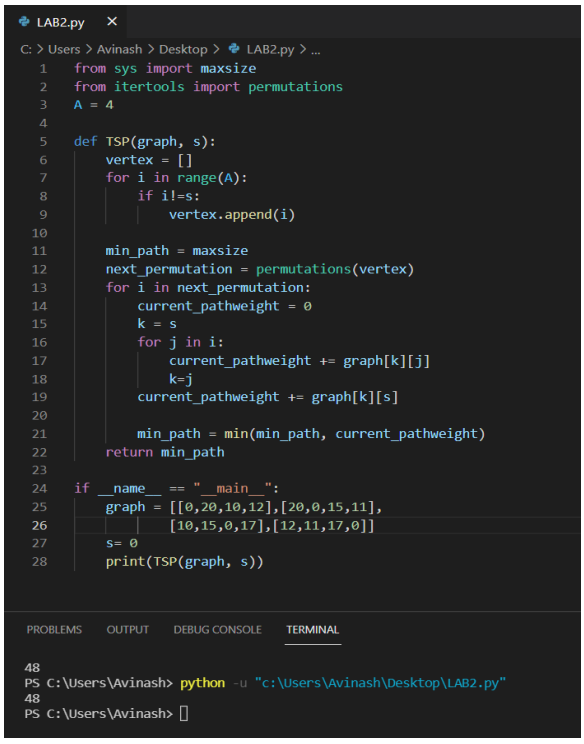





```
from sys import maxsize
from itertools import permutations
A = 4

def TSP(graph, s):
   vertex = []
   for i in range(A):
      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

if __name__ == "__main__":
   graph = [[0,20,10,12],[20,0,15,11],
         [10,15,0,17],[12,11,17,0]]
   s= 0
   print(TSP(graph, s))
```

Screenshots of the Outputs





Result:

Successfully implemented the code to find the shortest path between cities for the travelling salesman problem.

Medical Diagnosis System

AIM: To Implement Medical Diagnosis System using python.

Description of the concept or problem given:

Medical diagnosis is basically a pattern classification phenomenon: based on some input given by patient and a expect gives a conclusion on the basis of its knowledge. This is stored in binary form, and finally the result is calculated to the point either patient suffering from disease or not.

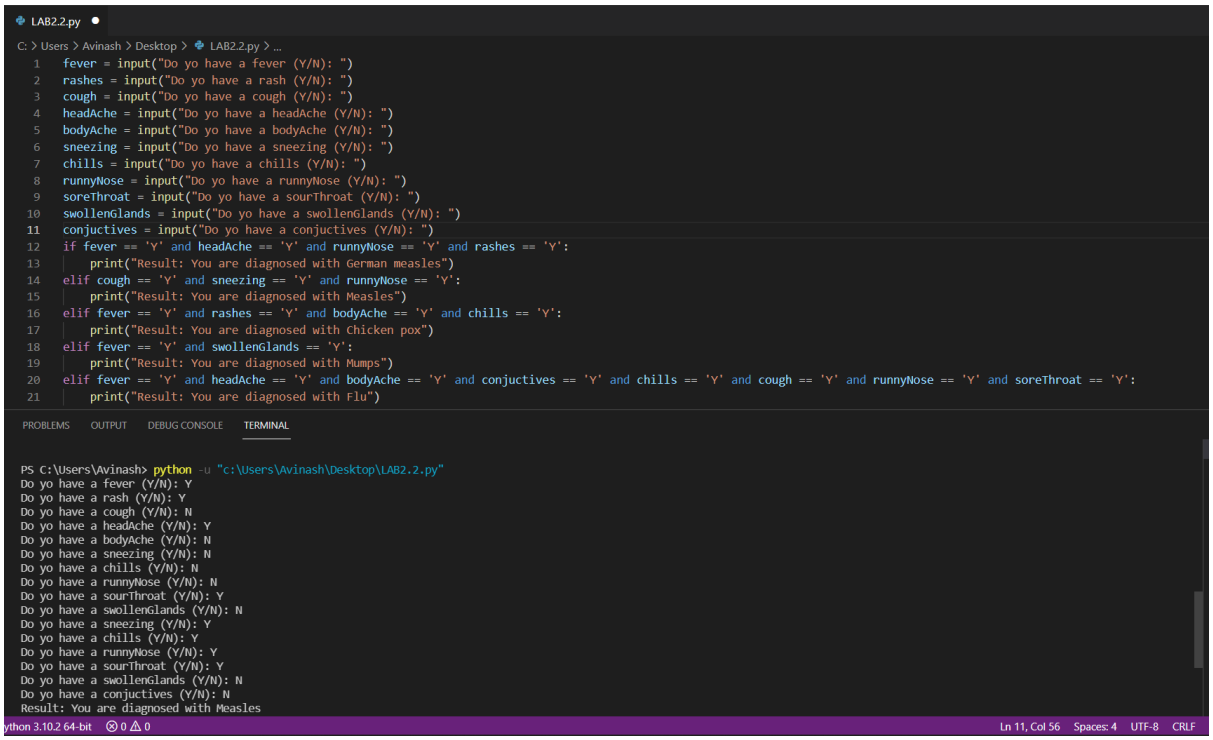
Manual Solution:

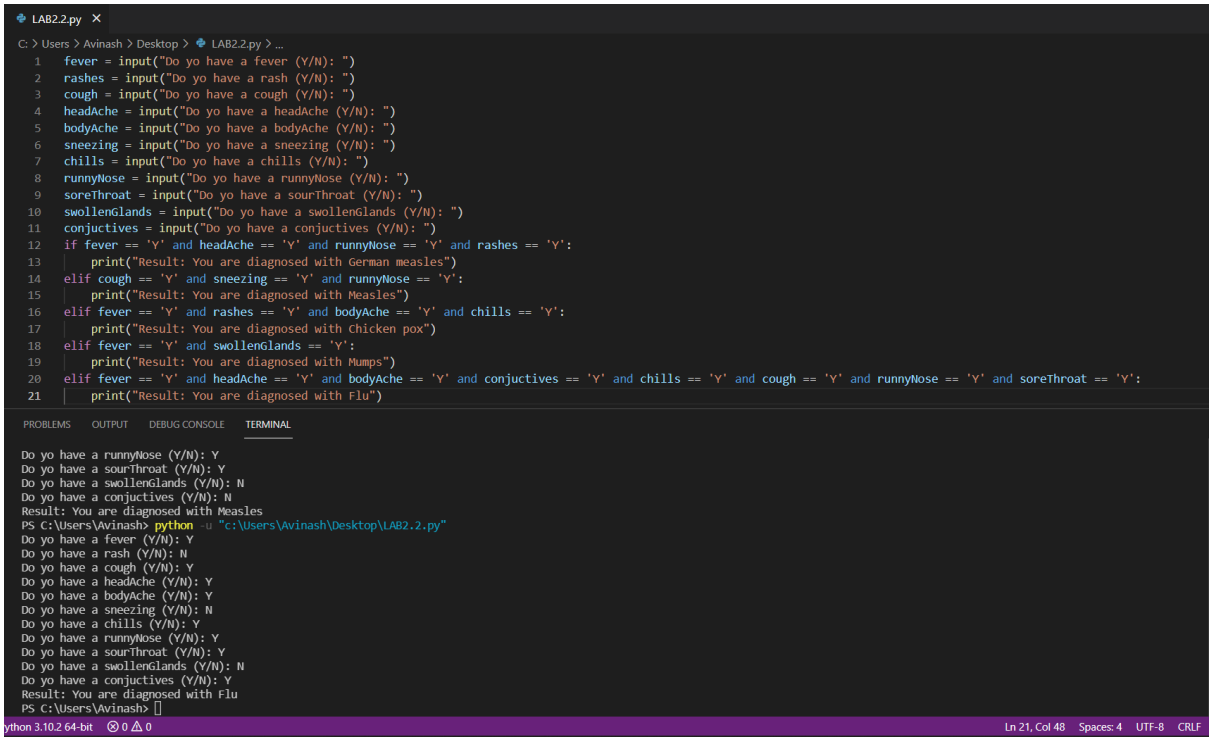
This is basic program in Python where the patient is asked series of questions and for which the patient replies YES or NO. This process is setup with if and elif conditions for every question asked and answers given will confirm the diagnosis.

Program Implementation [Coding]

```
fever = input("Do yo have a fever (Y/N): ")
rashes = input("Do yo have a rash (Y/N): ")
cough = input("Do yo have a cough (Y/N): ")
headAche = input("Do yo have a headAche (Y/N): ")
bodyAche = input("Do yo have a bodyAche (Y/N): ")
sneezing = input("Do yo have a sneezing (Y/N): ")
chills = input("Do yo have a chills (Y/N): ")
runnyNose = input("Do yo have a runnyNose (Y/N): ")
soreThroat = input("Do yo have a sourThroat (Y/N): ")
swollenGlands = input("Do yo have a swollenGlands (Y/N): ")
conjuctives = input("Do yo have a conjuctives (Y/N): ")

if fever == 'Y' and headAche == 'Y' and runnyNose == 'Y' and rashes == 'Y':
   print("Result: You are diagnosed with German measles")
elif cough == 'Y' and sneezing == 'Y' and runnyNose == 'Y':
   print("Result: You are diagnosed with Measles")
elif fever == 'Y' and rashes == 'Y' and bodyAche == 'Y' and chills == 'Y':
   print("Result: You are diagnosed with Chicken pox")
elif fever == 'Y' and swollenGlands == 'Y':
   print("Result: You are diagnosed with Mumps")
elif fever == 'Y' and headAche == 'Y' and bodyAche == 'Y' and conjuctives == 'Y' and chills == 'Y' and
cough == 'Y' and runnyNose == 'Y' and soreThroat == 'Y':
   print("Result: You are diagnosed with Flu")
```

Screenshots of the Outputs





```
LAB2.2.py
C: > Users > Avinash > Desktop > LAB2.2.py > ...
1   fever = input("Do yo have a fever (Y/N): ")
2   rashes = input("Do yo have a rash (Y/N): ")
3   cough = input("Do yo have a cough (Y/N): ")
4   headAche = input("Do yo have a headAche (Y/N): ")
5   bodyAche = input("Do yo have a bodyAche (Y/N): ")
6   sneezing = input("Do yo have a sneezing (Y/N): ")
7   chills = input("Do yo have a chills (Y/N): ")
8   runnyNose = input("Do yo have a runnyNose (Y/N): ")
9   soreThroat = input("Do yo have a sourThroat (Y/N): ")
10  swollenGlands = input("Do yo have a swollenGlands (Y/N): ")
11  conjuctives = input("Do yo have a conjuctives (Y/N): ")
12  if fever == 'Y' and headAche == 'Y' and runnyNose == 'Y' and rashes == 'Y':
13      print("Result: You are diagnosed with German measles")
14  elif cough == 'Y' and sneezing == 'Y' and runnyNose == 'Y':
15      print("Result: You are diagnosed with Measles")
16  elif fever == 'Y' and rashes == 'Y' and bodyAche == 'Y' and chills == 'Y':
17      print("Result: You are diagnosed with Chicken pox")
18  elif fever == 'Y' and swollenGlands == 'Y':
19      print("Result: You are diagnosed with Mumps")
20  elif fever == 'Y' and headAche == 'Y' and bodyAche == 'Y' and conjuctives == 'Y' and chills == 'Y' and cough == 'Y' and runnyNose == 'Y' and soreThroat == 'Y':
21      print("Result: You are diagnosed with Flu")

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

Do yo have a runnyNose (Y/N): Y
Do yo have a sourThroat (Y/N): Y
Do yo have a swollenGlands (Y/N): N
Do yo have a conjuctives (Y/N): N
Result: You are diagnosed with Measles
PS C:\Users\Avinash> python -u "c:\Users\Avinash\Desktop\LAB2.2.py"
Do yo have a fever (Y/N): Y
Do yo have a rash (Y/N): N
Do yo have a cough (Y/N): Y
Do yo have a headAche (Y/N): Y
Do yo have a bodyAche (Y/N): Y
Do yo have a sneezing (Y/N): N
Do yo have a chills (Y/N): Y
Do yo have a runnyNose (Y/N): Y
Do yo have a sourThroat (Y/N): Y
Do yo have a swollenGlands (Y/N): N
Do yo have a conjuctives (Y/N): Y
Result: You are diagnosed with Flu
PS C:\Users\Avinash>

ython 3.10.2 64-bit  ⊗ 0 ⚠ 0  Ln 21, Col 48  Spaces: 4  UTF-8  CRLF
```

Result:

Successfully implemented the code to diagnosis a disease for a patient with his given inputs for fever, headAche and others as mentioned.

Avinash reddy Vasipalli