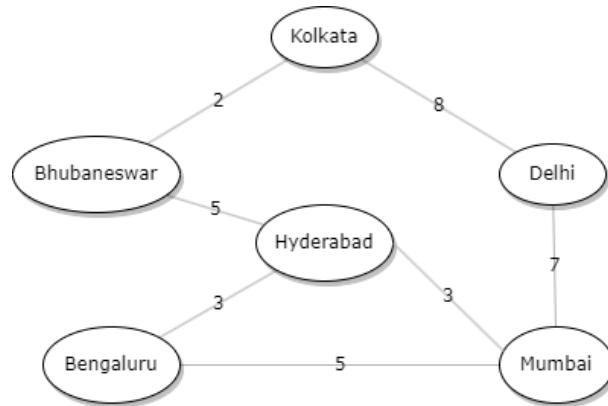


Implement the **BFS** (Bread-First Search) and **UCS** (Uniform-Cost Search) using Python in the context of AI.

BFS (Breadth-First Search)

Aim: Given any graph (map), this code will provide the shortest path (ignoring the path cost) to reach the goal city from the initial city.

For this example:



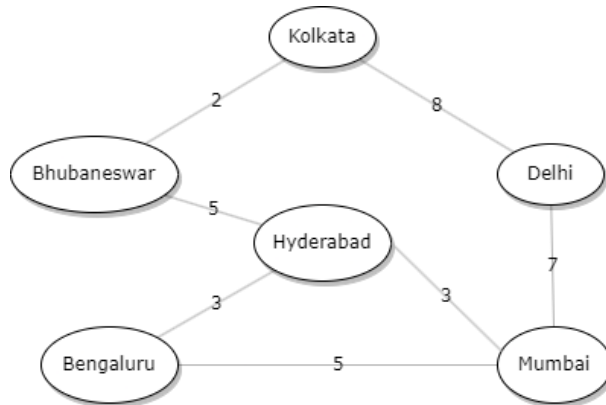
The output for this example if we want to go from “Kolkata” to “Mumbai”:

```
How many destinations are there?: 6
Enter the name of all destinations:
Kolkata
Bhubaneswar
Hyderabad
Bengaluru
Delhi
Mumbai
Press '1' if there is any path in between otherwise '0'
Kolkata --> Bhubaneswar: 1
Kolkata --> Hyderabad: 0
Kolkata --> Bengaluru: 0
Kolkata --> Delhi: 1
Kolkata --> Mumbai: 0
Bhubaneswar --> Hyderabad: 1
Bhubaneswar --> Bengaluru: 0
Bhubaneswar --> Delhi: 0
Bhubaneswar --> Mumbai: 0
Hyderabad --> Bengaluru: 1
Hyderabad --> Delhi: 0
Hyderabad --> Mumbai: 1
Bengaluru --> Delhi: 0
Bengaluru --> Mumbai: 1
Delhi --> Mumbai: 1
Enter the name of the initial state: Kolkata
Enter the name of the final state: Mumbai
Kolkata:Go(Delhi) -> Delhi:Go(Mumbai) -> Mumbai
```

UCS (Uniformed-Cost Search)

Aim: Given any graph (map), this code will provide the shortest path in terms of path cost to reach the goal city from the initial city.

For the same example:



The output for this example if we want to go from “Kolkata” to “Mumbai”:

How many destinations are there?: 6

Enter the name of all destinations:

Kolkata

Bhubaneswar

Hyderabad

Delhi

Bangaluru

Mumbai

Enter the path cost if there is any path in between otherwise '0'

Kolkata --> Bhubaneswar: 2

Kolkata --> Hyderabad: 0

Kolkata --> Delhi: 8

Kolkata --> Bangaluru: 0

Kolkata --> Mumbai: 0

Bhubaneswar --> Hyderabad: 5

Bhubaneswar --> Delhi: 0

Bhubaneswar --> Bangaluru: 0

Bhubaneswar --> Mumbai: 0

Hyderabad --> Delhi: 0

Hyderabad --> Bangaluru: 3

Hyderabad --> Mumbai: 3

Delhi --> Bangaluru: 0

Delhi --> Mumbai: 7

Bangaluru --> Mumbai: 5

Enter the name of the initial state: **Kolkata**

Enter the name of the final state: **Mumbai**

Kolkata:Go(Bhubaneswar) -> Bhubaneswar:Go(Hyderabad) -> Hyderabad:Go(Mumbai) -> Mumbai

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