

Date: Ex No: 5.1	Title of the Lab Implementation of Best First Algorithm	Name: Yuvraj Singh Chauhan Registration Number: RA1911027010058 Section: N1 Lab Batch: 1 Day Order: 3
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AIM:

To implement the Best First Algorithm.

Description of the Concept or Problem given:

In BFS and DFS, when we are at a node, we can consider any of the adjacent as the next node. So both BFS and DFS blindly explore paths without considering any cost function. The idea of Best First Search is to use an evaluation function to decide which adjacent is most promising and then explore.

Manual Solution:

1. Define a list, OPEN, consisting solely of a single node, the start node, s.
2. IF the list is empty, return failure.
3. Remove from the list the node n with the best score (the node where f is the minimum), and move it to a list, CLOSED.
4. Expand node n.
5. IF any successor to n is the goal node, return success and the solution (by tracing the path from the goal node to s).
6. FOR each successor node: 1. apply the evaluation function, f, to the node. 2. IF the node has not been in either list, add it to OPEN.
7. Looping structure by sending the algorithm back to the second step.

Program Implementation [Coding]:

```
from queue import PriorityQueue
```

```
v = 14
```

```
graph = [[] for i in range(v)]
```

```
def best_first_search(source, target, n):
```

```
    visited = [0] * n
```

```
    visited[0] = True
```

```
    pq = PriorityQueue()
```

```
    pq.put((0, source))
```

```
    while pq.empty() == False:
```

```
        u = pq.get()[1]
```

```
        print(u, end=" ")
```

```
        if u == target:
```

```
            break
```

```
        for v, c in graph[u]:
```

```
            if visited[v] == False:
```

```
                visited[v] = True
```

```
                pq.put((c, v))
```

```
    print()
```

```
def addedge(x, y, cost):
```

```
    graph[x].append((y, cost))
```

```
    graph[y].append((x, cost))
```

```
adddedge(0, 1, 3)
```

```
adddedge(0, 2, 6)
```

```
adddedge(0, 3, 5)
```

```
adddedge(1, 4, 9)
```

```
adddedge(1, 5, 8)
```

```
adddedge(2, 6, 12)
```

```
adddedge(2, 7, 14)
```

```
adddedge(3, 8, 7)
```

```
adddedge(8, 9, 5)
```

```
addedge(8, 10, 6)
```

```
addedge(9, 11, 1)
```

```
addedge(9, 12, 10)
```

```
addedge(9, 13, 2)
```

```
source = 0
```

```
target = 9
```

```
best_first_search(source, target, v)
```

Screenshots of the Outputs:

0 1 3 2 8 9

Signature of the Student

[YUVRAJ SINGH CHAUHAN]