Experiment 3

Foundations of AI

Dijkstra algorithm

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AIM:-

To find the shortest distance of every node from the starting node using Dijkstra algorithm

RESULTS AND OUTPUT:-

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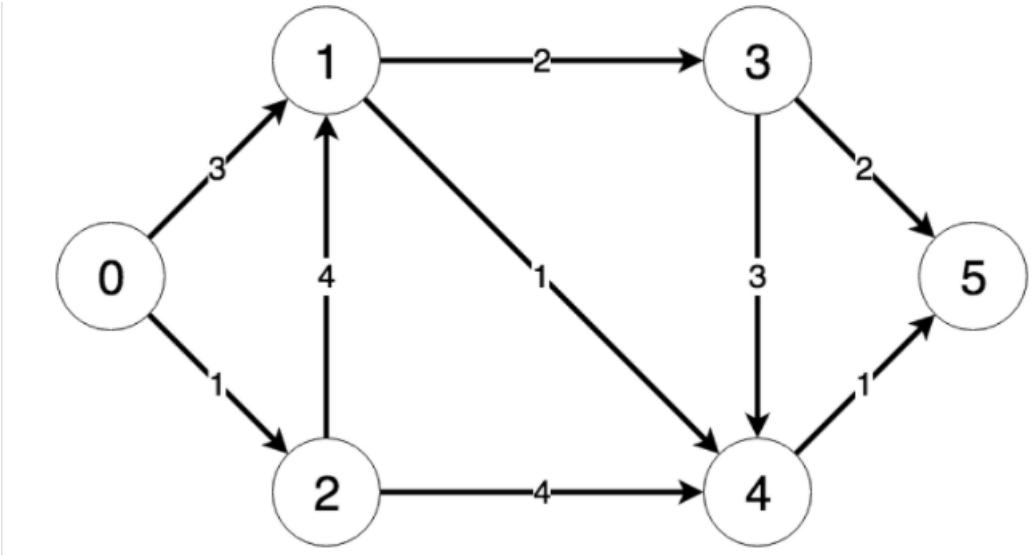
Test case 1:-



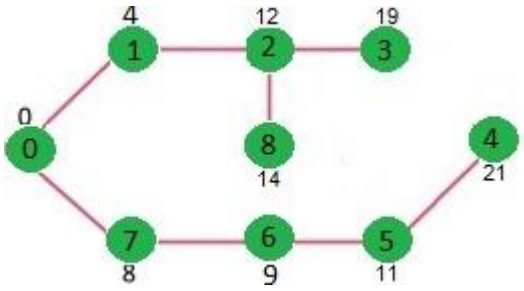
Graph

	V1	V2	V3	V4	V5	V6
1	0	3	1	0	0	0
2	0	0	0	2	1	0
3	0	4	0	0	4	0
4	0	0	0	0	3	2
5	0	0	0	0	0	1
6	0	0	0	0	0	0

Output

```
> test_case_1 <- matrix(c(0,3,1,0,0,0,0,0,0,2,1,0,0,4,0,0,4,0,0,0,0,0,0,3,2,0,0,0,0,0,1,0,0,0,0,0,0), nrow = 6,byrow = TRUE)
> dijkstra(test_case_1,1)
[1] 0 3 1 5 4 5
>
```

Test case 2:-



Graph

	V1	V2	V3	V4	V5	V6	V7	V8	V9
1	0	4	0	0	0	0	0	8	0
2	4	0	8	0	0	0	0	11	0
3	0	8	0	7	0	4	0	0	2
4	0	0	7	0	9	14	0	0	0
5	0	0	0	9	0	10	0	0	0
6	0	0	4	14	10	0	2	0	0
7	0	0	0	0	0	2	0	1	6
8	8	11	0	0	0	0	1	0	7
9	0	0	2	0	0	0	6	7	0

Output

```
> test_case_2 <- matrix(c(0, 4, 0, 0, 0, 0, 0, 8, 0,4, 0, 8, 0, 0, 0, 0, 11, 0,0, 8, 0, 7, 0, 4, 0, 0, 2,0, 0, 7, 0, 9, 14, 0, 0, 0,0, 0, 0, 9, 0, 10, 0, 0, 0,
0, 0, 4, 14, 10, 0, 2, 0, 0,0, 0, 0, 0, 0, 2, 0, 1, 6,8, 11, 0, 0, 0, 0, 1, 0, 7,0, 0, 2, 0, 0, 0, 6, 7, 0), nrow = 9,byrow = TRUE)
> dijkstra(test_case_2,1)
[1]  0  4 12 19 21 11  9  8 14
>
```