CS2023 - Data Structures and Algorithms

In-class Lab Exercise - Week 12

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1. Adjacency matrix representation

	0	**1**	**2**	**3**	**4**	**5**
0	0	10	0	0	15	5
1	10	0	10	30	0	0
2	0	10	0	12	5	0
3	0	30	12	0	0	20
4	15	0	5	0	0	0
5	5	0	0	20	0	0

3. Terminal output of Djikstra's algorithm for each source node

```
Source node = 0
0 -> 1: 10
0 -> 2: 20
0 -> 3: 25
0 -> 4: 15
0 -> 5: 5

Source node = 1
1 -> 0: 10
1 -> 2: 10
1 -> 3: 22
1 -> 4: 15
1 -> 5: 15

Source node = 2
2 -> 0: 20
2 -> 1: 10
2 -> 3: 12
2 -> 4: 5
2 -> 5: 25
```

```
Source node = 3
3 -> 0: 25
3 -> 1: 22
3 -> 2: 12
3 -> 4: 17
3 -> 5: 20

Source node = 4
4 -> 0: 15
4 -> 1: 15
4 -> 2: 5
4 -> 3: 17
4 -> 5: 20

Source node = 5
5 -> 0: 5
5 -> 1: 15
5 -> 2: 25
5 -> 3: 20
5 -> 4: 20
```

4. **Average time from each city to all other cities**

```
Average time from each source city
Source  Time
0       15
1       14.4
2       14.4
3       19.2
4       14.4
5       17
```

The best city to build the hospital is either 1, 2 or 4, as they all have the minimum average time of 14.4.

Complete GitHub repository for code: https://github.com/Anuki16/cs2023-data-structures-algorithms