CS2023 - Data Structures and Algorithms

In-class Lab Exercise - Week 10

May 16, 2023

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Section 1

1. Adjacency list representation

1	→	2 → 3 → 4 → 5
2	→	1 → 3 → 6
3	→	1 → 2
4	→	1 → 7 → 8 → 6
5	→	1 → 7 → 8 → 6
6	→	4 → 5 → 2
7	→	4 → 5
8	→	4 → 5

4. Terminal Output

```
1 : 2 3 4 5
2 : 1 3 6
3 : 1 2
4 : 1 7 8 6
5 : 1 7 8 6
6 : 4 5 2
7 : 4 5
8 : 4 5
```

5. To accept directed edges

If there is a directed edge from u to v, instead of adding u and v to each other's neighbor list, we can do only adding v to u's neighbor list.

```
void addedge_directed(int u, int v){
    //select node u and push v into u's neighbour
    nodes[u].neighbours.push_back(v);
}
```

Section 2

Check the similarity between node 4 and each of the neighbors of node 1 to find the most similar node to node 4.

Neighbor of node 1	Complete neighbor count with node 4	Common neighbor count with node 4	Similarity score
2	5	2	2/5 = 0.4
3	5	1	1/5 = 0.2
5	4	4	4/4 = 1.0

Nodes 4 and 5 have edges with the same nodes. Therefore they have the highest similarity score. Node 5 should be suggested to node 4 next.

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