

CS2023 - Data Structures and Algorithms

In-class Lab Exercise

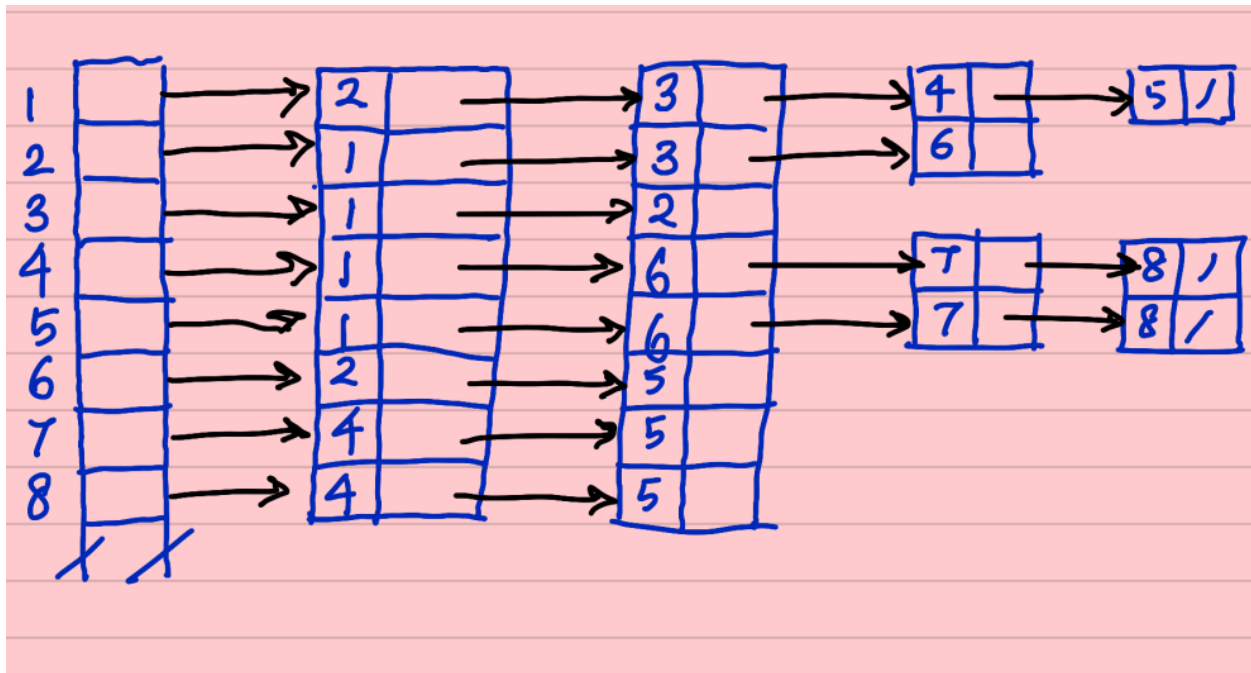
Week 9

Name: A.A.H. Pramuditha

Index: 200476P

Question 1

1)



4)

```
"D:\Semester 4\CS2023 - Data Structures and Algorithms\In Class labs\In-class Lab 10\graph_lab.exe"
The neighbors of the node 1: 2 3 4 5
The neighbors of the node 2: 1 3 6
The neighbors of the node 3: 1 2
The neighbors of the node 4: 1 6 7 8
The neighbors of the node 5: 1 6 7 8
The neighbors of the node 6: 2 4 5
The neighbors of the node 7: 4 5
The neighbors of the node 8: 4 5

Process returned 0 (0x0)   execution time : 0.045 s
Press any key to continue.
```

5) Then we should implement a single element entry operation. The updated code is as follows.

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

Question 2

$$\text{Sim}(a, b) = \frac{\text{\# of shared neighbors between } a \text{ and } b}{\text{Total neighbors in } a, b} = \frac{a \cap b}{a \cup b}$$

Let's consider the similarity between node 4 and possible nodes which can be connected with node 4.

- $\text{Sim}(4, 2) = \frac{\text{\# of shared neighbors between 4 and 2}}{\text{Total neighbors in 4,2}} = \frac{2}{5}$
- $\text{Sim}(4, 3) = \frac{\text{\# of shared neighbors between 4 and 3}}{\text{Total neighbors in 4,3}} = \frac{1}{5}$
- $\text{Sim}(4, 5) = \frac{\text{\# of shared neighbors between 4 and 5}}{\text{Total neighbors in 4,5}} = \frac{4}{4} = 1$

According to the similarity prediction, node 5 is the most suitable one to connect with node 4.

Link for the Git hub repository: [hashirupramuditha/CS2023---Data-Structures-Algorithms \(github.com\)](https://github.com/hashirupramuditha/CS2023---Data-Structures-Algorithms)