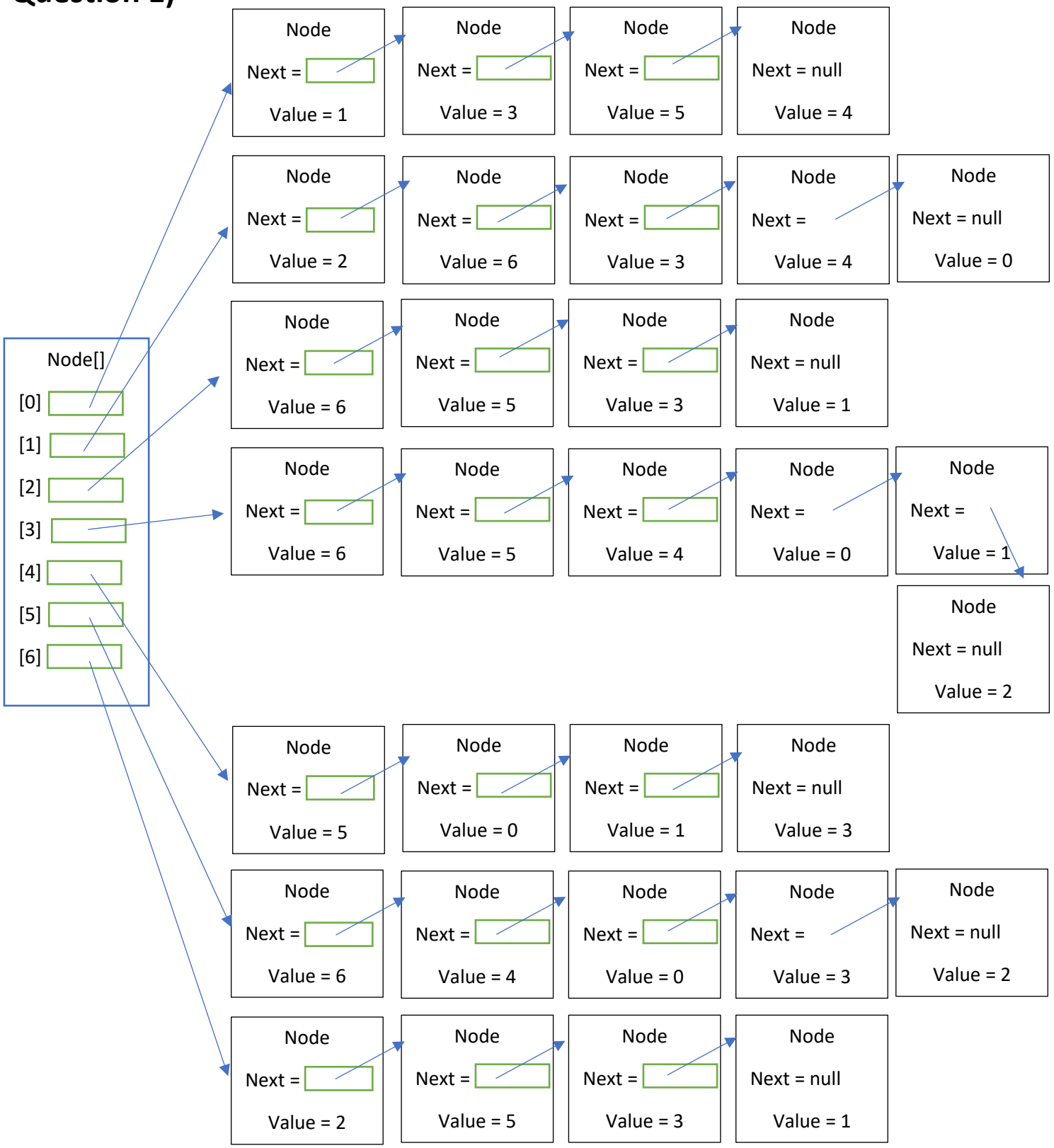
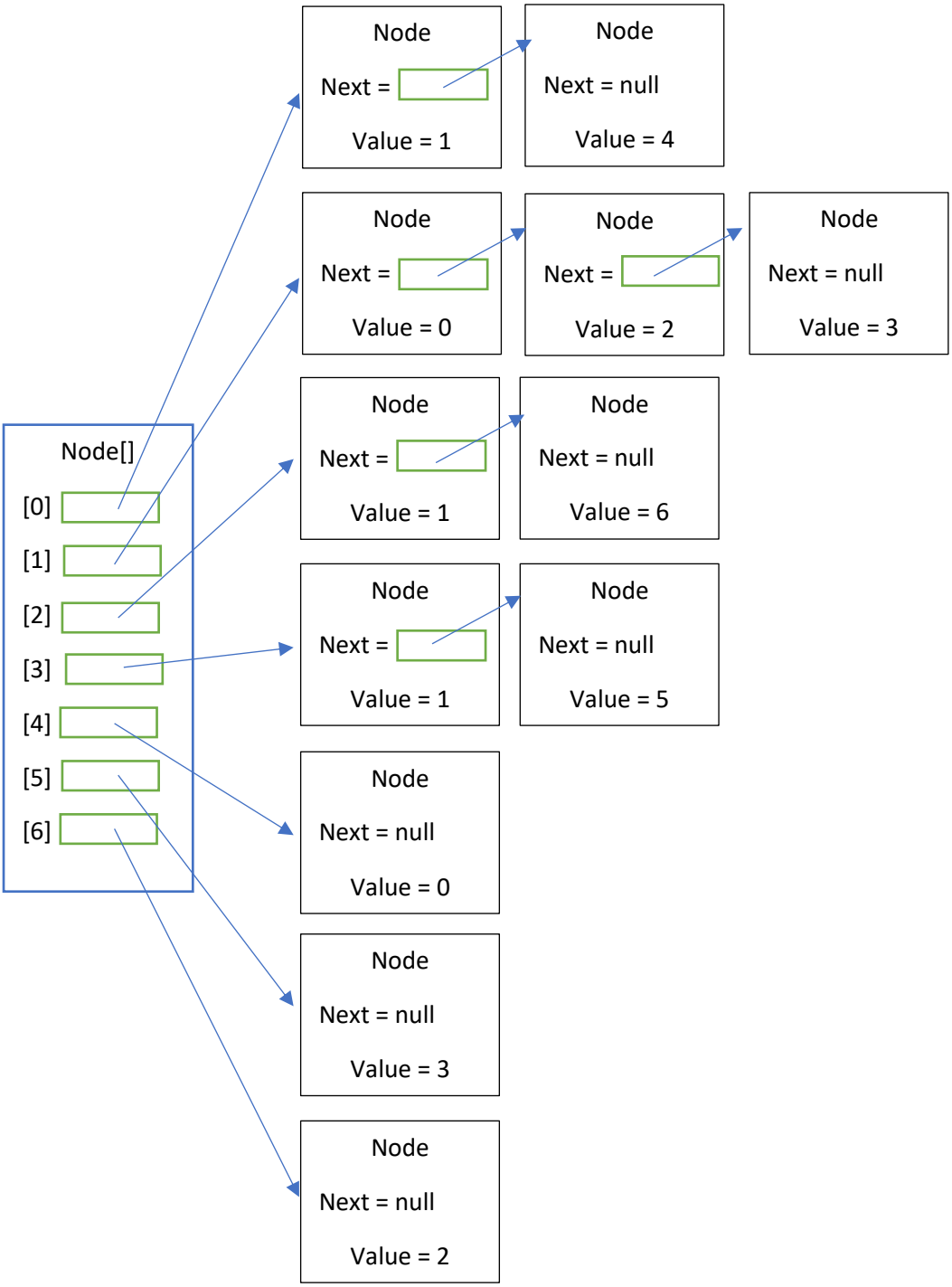
# GIT Department of Computer Engineering
# CSE 222/505 - Spring 2020
# Harun Albayrak – 171044014 - Homework 8

## Question 1)




Node[]
[0]
[1]
[2]
[3]
[4]
[5]
[6]
Node
Next =
Value = 1
Node
Next = null
Value = 4
Node
Next =
Value = 0
Node
Next =
Value = 2
Node
Next = null
Value = 3
Node
Next =
Value = 1
Node
Next = null
Value = 6
Node
Next =
Value = 1
Node
Next = null
Value = 5
Node
Next = null
Value = 0
Node
Next = null
Value = 3
Node
Next = null
Value = 2

| | [0] | [1] | [2] | [3] | [4] | [5] | [6] |
|---|---|---|---|---|---|---|---|
| **[0]** | | **1.0** | | **1.0** | **1.0** | **1.0** | |
| **[1]** | **1.0** | | **1.0** | **1.0** | **1.0** | | **1.0** |
| **[2]** | | **1.0** | | **1.0** | | **1.0** | **1.0** |
| **[3]** | **1.0** | **1.0** | **1.0** | | **1.0** | **1.0** | **1.0** |
| **[4]** | **1.0** | **1.0** | | **1.0** | | **1.0** | |
| **[5]** | **1.0** | | **1.0** | **1.0** | **1.0** | | **1.0** |
| **[6]** | | **1.0** | **1.0** | **1.0** | | **1.0** | |

| | [0] | [1] | [2] | [3] | [4] | [5] | [6] |
|---|---|---|---|---|---|---|---|
| **[0]** | | **1.0** | | | **1.0** | | |
| **[1]** | **1.0** | | **1.0** | **1.0** | | | |
| **[2]** | | **1.0** | | | | | **1.0** |
| **[3]** | | **1.0** | | | | **1.0** | |
| **[4]** | **1.0** | | | | | | |
| **[5]** | | | | **1.0** | | | |
| **[6]** | | **1.0** | | | | | |

**For 1.graph**

|V| = 7 , |E| = 16

|E| / |V|^2 → 16 / 49 = 0,326

**For 2.graph**

|V| = 7 , |E| = 6

|E| / |V|^2 → 6 / 49 = 0,122

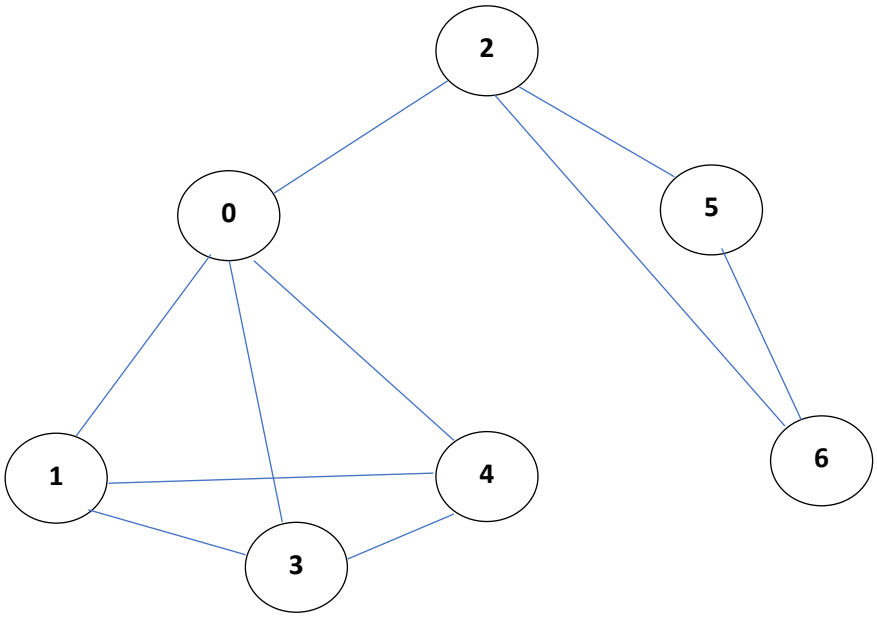
If the graph is dense, the adjacency matrix representation is better

If the graph is sparse, the adjacency list representation is better

Since first graph is dense, the adjacency matrix gives better performance.

Since second graph is sparse, the adjacency list gives better performance.

**Depth-first search**




Discovery(Visit) Order: 2, 5, 6

Finish Order:

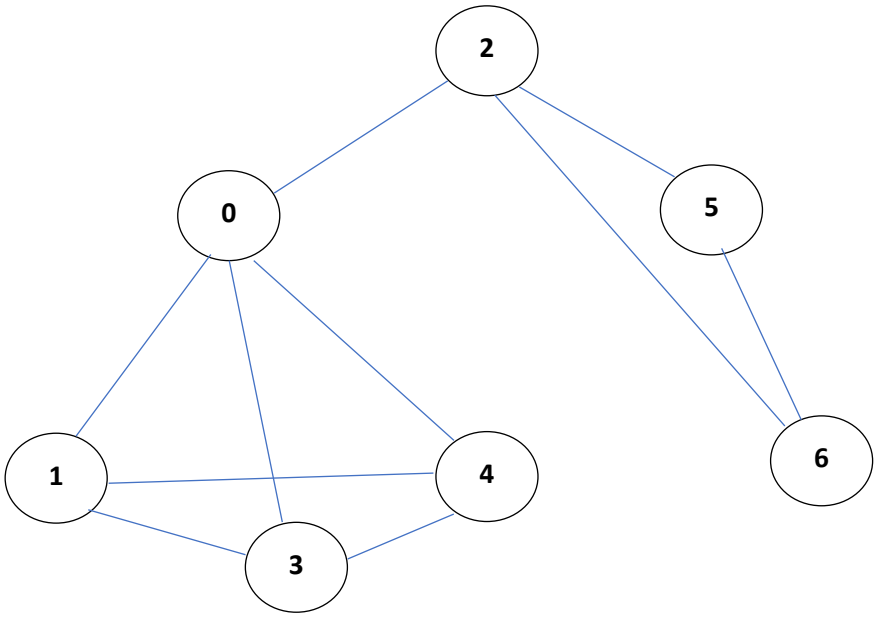
Discovery(Visit) Order: 2, 0, 1, 3, 4

Finish Order: 6, 5

Discovery(Visit) Order: 2, 0, 1, 3, 4

Finish Order: 6, 5, 4, 3, 1, 0, 2

**Depth-first search**




Queue: 0, 5

Visit Sequence: 2

Queue: 0, 6

Visit Sequence: 2, 5

Queue: 6, 4, 3, 1

Visit Sequence: 2, 5, 0

Queue: 4, 3, 1

Visit Sequence: 2, 5, 0, 6

Queue: empty

Visit Sequence: 2, 5, 0, 6, 4, 3, 1