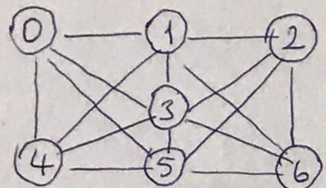
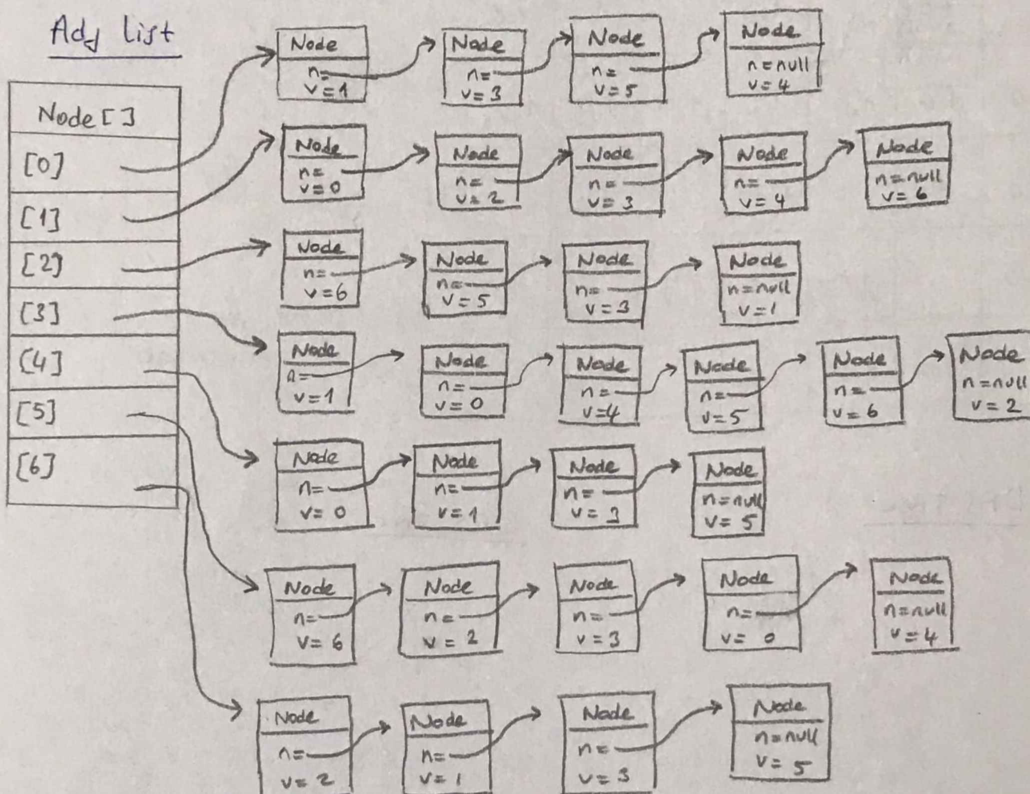
Elif KELEŞ
161044033

CSE 222 HW8

Q1)



Adj list

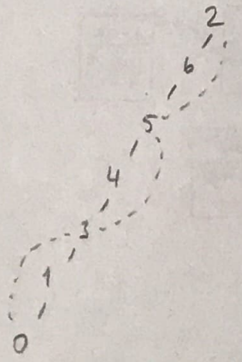


Adj Matrix

	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	

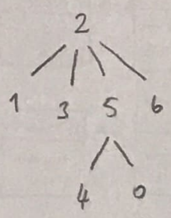
should be symmetrical

DFS Tree



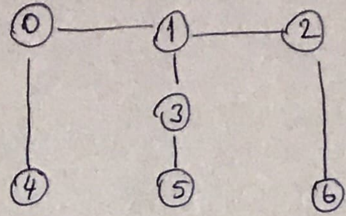
2, 6, 5, 4, 3, 1, 0

BFS Tree

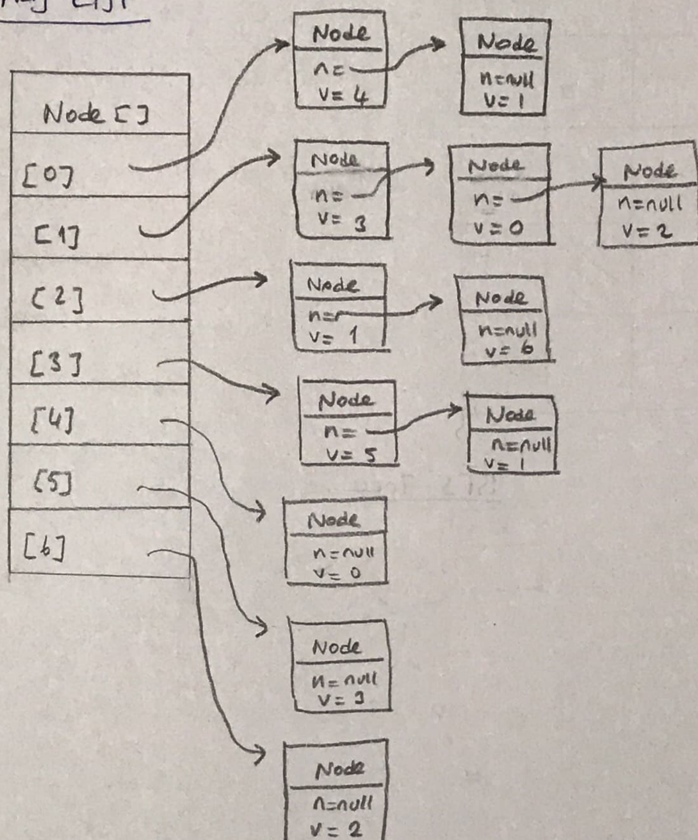


2, 6, 5, 3, 1, 4, 0

(starting from vertex 2)


0
1
2
3
4
5
6

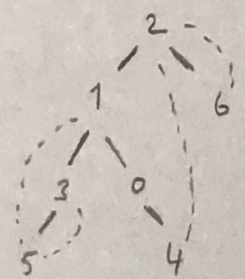
Adj List


Node [ ]
[0]
[1]
[2]
[3]
[4]
[5]
[6]
Node
n=
v= 4
Node
n=null
v= 1
Node
n=
v= 3
Node
n=
v= 0
Node
n=null
v= 2
Node
n=
v= 1
Node
n=null
v= 6
Node
n=
v= 5
Node
n=null
v= 1
Node
n=null
v= 0
Node
n=null
v= 3
Node
n=null
v= 2

Adj. Matrix

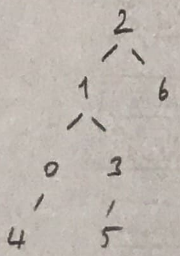
	0	1	2	3	4	5	6
0		1.0			1.0		
1	1.0		1.0	1.0			
2		1.0					1.0
3		1.0				1.0	
4	1.0						
5				1.0			
6			1.0				

DFS Tree



2, 6, 1, 3, 5, 0, 4

BFS Tree



2, 6, 1, 3, 0, 5, 4

(Starting from vertex 2)

For the first graph:

$|V| = 7$, $|E| = 16$ $\Rightarrow$ Density $= \frac{|E|}{|V|^2} = \frac{16}{49}$

For the second graph:

$|V| = 7$, $|E| = 6$ $\Rightarrow$ Density $= \frac{|E|}{|V|^2} = \frac{6}{49}$

As can be seen in the lists and tables, a dense graph takes more time when searching for nodes as list, compared to a sparse graph

And a sparse graph's adjacent table is mostly empty, which is a waste of memory

It is better to represent dense graphs as adj. matrices and sparse graphs as adj. lists.