

May 2017

M	1	8	15	22	29
T	2	9	16	23	30
W	3	10	17	24	31
T	4	11	18	25	
F	5	12	19	26	
S	6	13	20	27	
S	7	14	21	28	

June 2017

M	5	12	19	26
T	6	13	20	27
W	7	14	21	28
T	1	8	15	22
F	2	9	16	23
S	3	10	17	24
S	4	11	18	25

July 2017

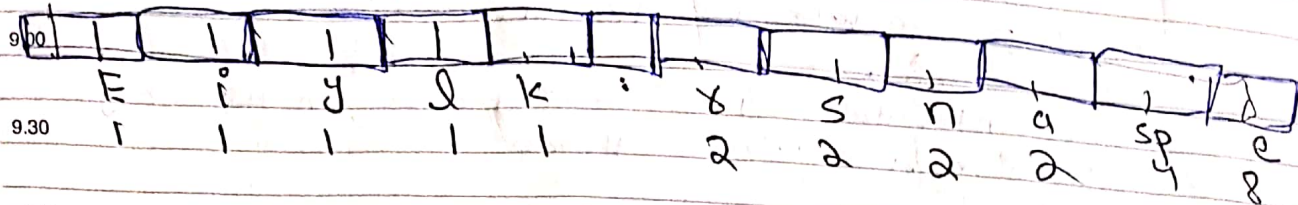
M	31	3	10	17	24
T		4	11	18	25
W		5	12	19	26
T		6	13	20	27
F		7	14	21	28
S	1	8	15	22	29
S	2	9	16	23	30

23 Sunday 204/161

8.00 am

The queue after inserting all nodes

8.30



10.00

lecture #14

=> Graph

=> Depth First Search

=> Breadth First Search

11.00

→ will do Analysis, Implementation and Space but minority touch

11.30

Noon

Def

↳ Collection of node and edge
↳ Undirected graph have no arrow
is kind of

12.30

=> Tree special kind of graph have n vertices and $n-1$ edges

1.00

1.30

Tree

↳ No cycle
↳ No parent child relation
↳ n vertices $n-1$ edges

2.00

2.30

3.00

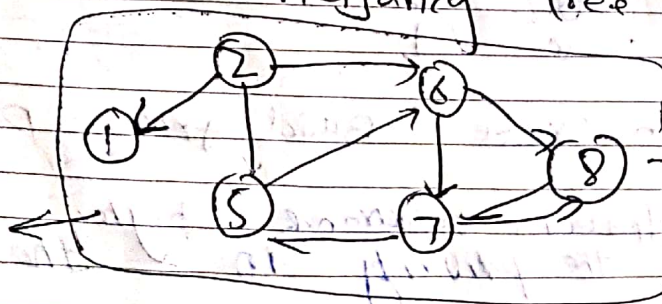
3.30

4.00

4.30

5.00

Adjacency Tree Matrix



Just understand

6.00 pm

August 2017
 M 1 7 14 21 28
 T 2 8 15 22 29
 W 3 9 16 23 30
 T 4 10 17 24 31
 F 5 11 18 25
 S 6 12 19 26 27

September 2017
 M 4 11 18 25
 T 5 12 19 26
 W 6 13 20 27
 T 7 14 21 28
 F 8 15 22 29
 S 9 16 23 30
 10 17 24

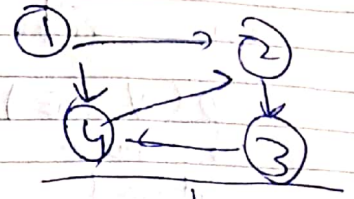
October 2017
 M 30 2 9 16 23
 T 31 3 10 17 24
 W 4 11 18 25
 T 5 12 19 26
 F 6 13 20 27
 S 7 14 21 28
 1 8 15 22 29

July
 WEEK 30

205/160 Monday 24

Adjacency Matrix Representation

$$adj = \begin{bmatrix} 0 & 0 & 0 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$



Programmer's view

User view

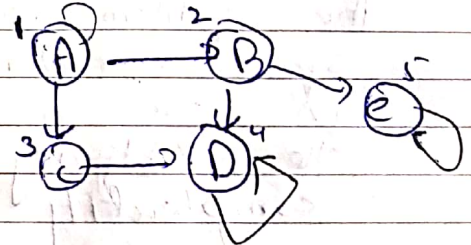
If you look at the Adj Matrix you can see the in column wise is inward going and row wise outgoing view

But what about data where we will locate in the Adj Matrix so...

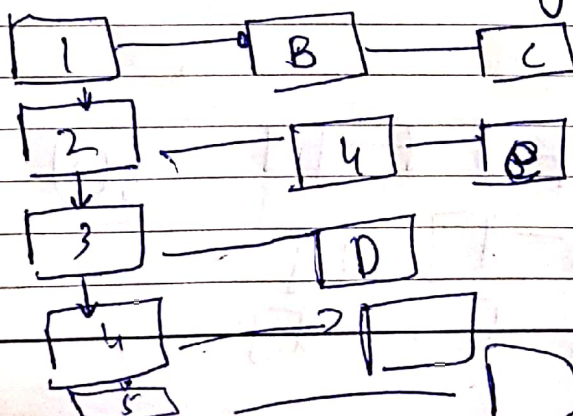
$$Adj = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & 0 \\ 2 & 0 & 1 \\ 3 & 1 & 1 \end{bmatrix} \xrightarrow{\text{data}} \begin{bmatrix} a \\ B \\ c \end{bmatrix} \rightarrow \text{this data}$$

Adjacency List Representation

$$Adj = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ 1 & 1 & 1 & 0 & 0 \\ 2 & 1 & 1 & 0 & 1 \\ 3 & 1 & 0 & 1 & 0 \\ 4 & 0 & 0 & 0 & 0 \\ 5 & 0 & 0 & 0 & 0 \end{bmatrix}$$



When we will write the matrix we will need lot of space because it is zero then we introduced single linked list in which contain only connect to node.



25 Tuesday 20/6/159

8.00 am

Analysis

8.30

→ Assuming both directed and undirected graph
his time complexity

9.00

$$O(V + E)$$

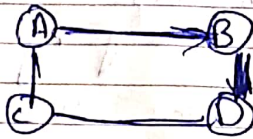
9.30

because if we created
at least we saved the graph at least
about vertex and edge information

10.00

for undirected graph

10.30



11.00

→ Vertex = V

edge = 2E

11.30

$$E = [e_1, e_2, e_3, e_4]$$

→ Why we not
take this because
E is general

Noon

the

12.30

$$O(E + V) \Rightarrow O(V + E)$$

1.00

General

1.30

The Problem in Adjacency Matrix is
space problem because it has zeros
in the matrix and issue in
the Adjacency list time
complexity

2.00

2.30

time complexity in Adjacency Matrix

3.00

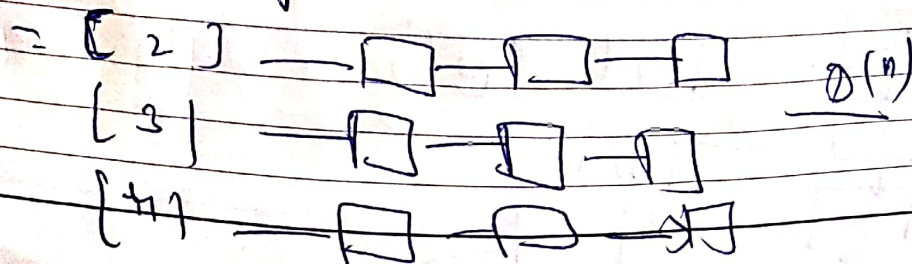
$$Adj = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix} = Adj[3][3] = O(1)$$

3.30

4.00

but in Adjacency list

4.30



5.00

6.00 pm

July
WEEK 30

August 2017							September 2017							October 2017						
M		7	14	21	28		M	4	11	18	25		M	30	2	9	16	23		
T	1	8	15	22	29		T	5	12	19	26		T	31	3	10	17	24		
W	2	9	16	23	30		W	6	13	20	27		W		4	11	18	25		
T	3	10	17	24	31		T	7	14	21	28		T		5	12	19	26		
F	4	11	18	25			F	1	8	15	22	29		F		6	13	20	27	
S	5	12	19	26			S	2	9	16	23	30		S		7	14	21	28	
S	6	13	20	27			S	3	10	17	24		S	1	8	15	22	29		

20/158 Wednesday 26

8.00 am both have one, one draw back
Depend upon the situation we
8.30 choose one of them.

9.00 Searching and Traversing
Digraphs

9.30 \Rightarrow BFS \rightarrow static
 \Rightarrow DFS \rightarrow BFS

10.00 Dep Breadth First Search

10.30 \rightarrow simulation has slide may
11.00 \rightarrow its element too its how search
recurring has

11.30 Time complexity of BFS = DFS

noon $O(1)$ $O(1)$
 \rightarrow breadth of stack and queue