Class 19

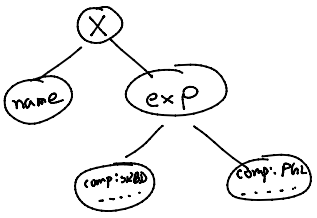
Thursday, September 15, 2022 9:54 PM

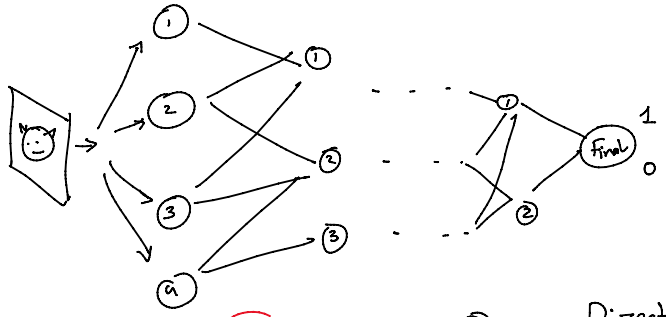
Graph Theory

sakib_info.json

key value

```
{ "name" : "sakib"
  "exp" : { { "company" : "SRBD"
              "yoe" : 2
            } { "company" : "PGL"
              "yoe" : 1
            }
  }
```



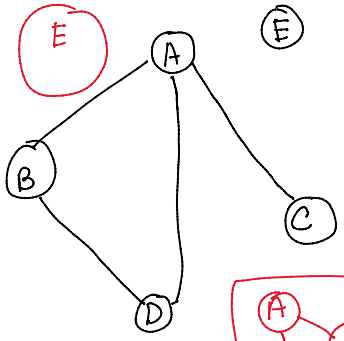


Node

Edge

Component(U)

Cycle(U)

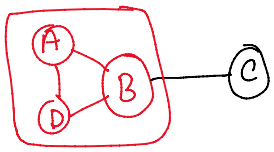


Directed

Undirected

People you may know

C

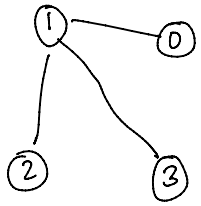


1) Adjacency matrix

2) Adjacency list

$10^5 \times 10^5 \simeq 10^{10} \times 1$

n → n×n



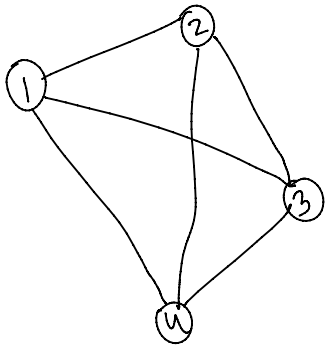
	0	1	2	3
0	0	1	0	0
1	1	0	1	1
2	0	1	0	0
3	0	1	0	0

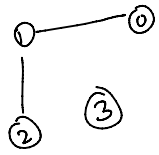
0 → 1

1 → 0, 2, 3

2 → 1

3 → 1





0 → 1

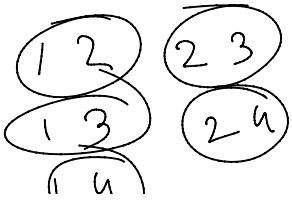
1 → 0, 2

2 → 1

3 →

$O(2E+V)$

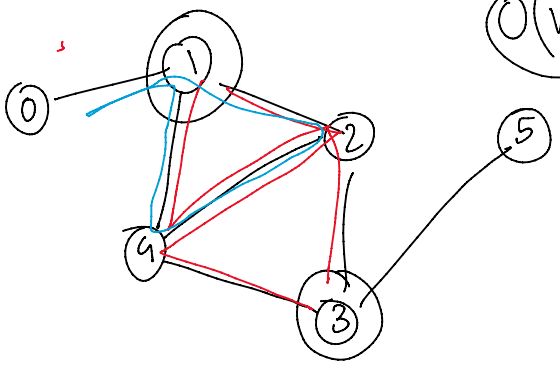
$\simeq O(E+V)$



$V_{C_2} = \frac{V(V-1)}{2}$

Gn - C

Complete Graph



hop

(1 3) (2 4) (4)

$^{4}C_2 = 6$

$^{V}C_2 = \frac{V(V-1)}{2}$

$\approx V^2$

Matrix

$O(V^2)$

List

$O(E+V) = O(V^2+V)$

$= O(V^2)$

[3, 11]

A^3

[1][3] = 2

2 5 10 3

3 4 5 6 7 8 9

5

arr[x] = 3

arr[5] = 10

200

value

indices

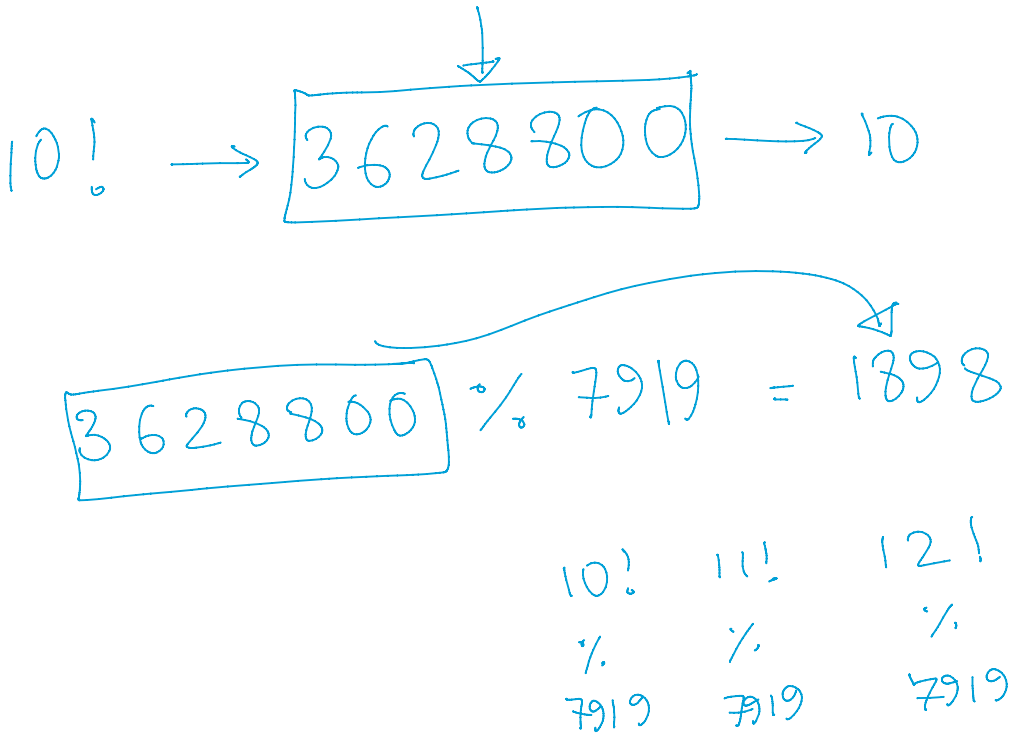
	value	indices
2	3	0, 5
1	10	11, 5
2	11	12135, 7

120 % (5 · 4 · 3 · 2 · 1) = 0

120 % 5

720 % (6 × 5 × 4 × 3 × 2 × 1)


10
11


10!
3628800
10
3628800 % 7919 = 1898
10! % 7919
11! % 7919
12! % 7919
13! % 7919
14! %