live

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CombineCS
The Extra Step

Basics

Math 2021

PART-2

GRAPH THEORY

RASHMI PRABHA

Daily live class at 3:30pm

LPP - VAM

Flyer, Hand

100

80% → 1%

Ugc net

3 months

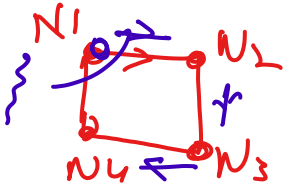
Revision

concept

next week

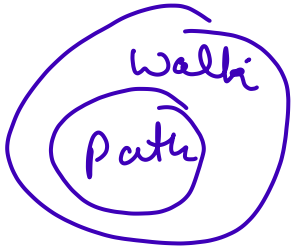
3.30

2019 Tree | Graph | Path | Walk



Trick → E → Edge

- Euler Graph → edge traverse
- Path → an open walk, edge/vertex will not Repeat, No self loop.
- Walk → No edge repeat, chain, self loop



Open walk → path

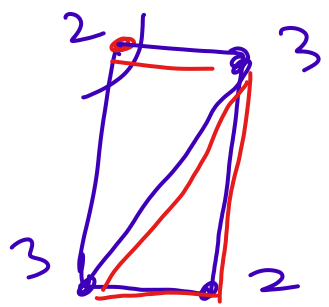
Closed walk → Circle

deg(N1) = N2 = N3 = N4 = 2

Euler graph → edge traverse

→ all nodes must be of even degree

Theorem → Exactly 2 vertices are of odd degree



all nodes
→ even degree
→ 2 node → odd degree

Path
Circuit
Graph

Euler path → all edges, circle skip — nodes can be repeated

Euler Circuit → start & end node should be same

Euler Graph → every edge traverse exactly once (edge will not repeat)

- Hamiltonian Graph

(A) - nodes visit, it can't be repeated

(B) Dirac's Theorem

concept

$deg(v) \geq n/2$

$n \geq 3$

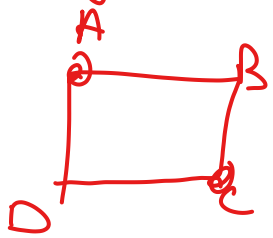
$n = 0, 1, 2 \rightarrow$

(C) Ore's theorem

$n \geq 3$

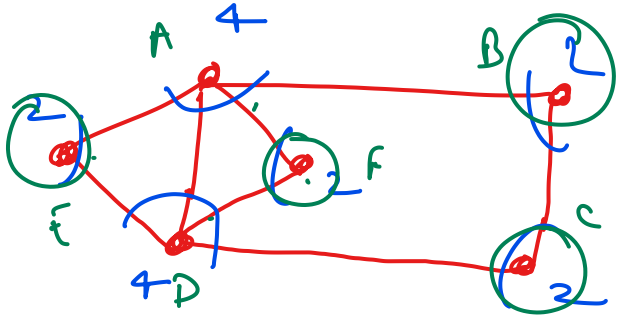
- $deg(u) + deg(v) \geq n$

$(u, v) \rightarrow$ adjacent nodes



A-C

B-D



eg

a) Euler → yes, degree of all vertices EVEN.
vertex can repeat

b) Hamiltonian →
vertex repeat X edge on repeat

$n = 6$

Dirac's: $\deg(v_i) \geq n/2$

$\deg(v_i) \geq 6/2 = 3$

$\deg(A) = 4 \geq 3$
$\deg(B) = 2 \geq 3$ X
$\deg(C) = 2 \geq 3$ X
$\deg(D) = 4 \geq 3$
$\deg(E) = 2 \geq 3$ X
$\deg(F) = 2 \geq 3$ X

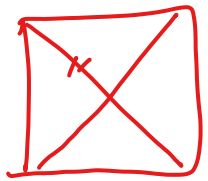
4 nodes ≤ 3 X

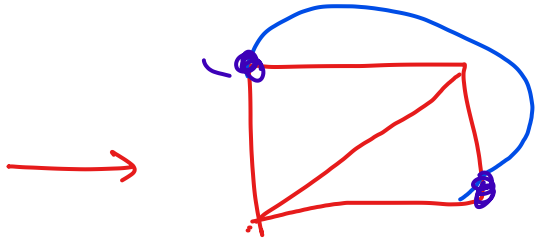
i represent vertex

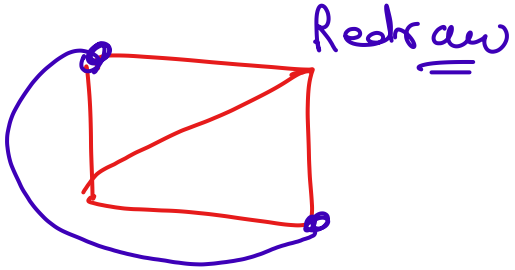
Not hamiltonian

Euler
Hamiltonian

- Planar Graph → Graph → redraw , NO Cross edge







Complete graph

every node is adjacent

→ (1) 2019.

→ (2) face

K_5, $K_{3,3}$ → Non-Planar

$$n + f = e + 2$$

node face edge

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Graph

- Isomorphic Graph

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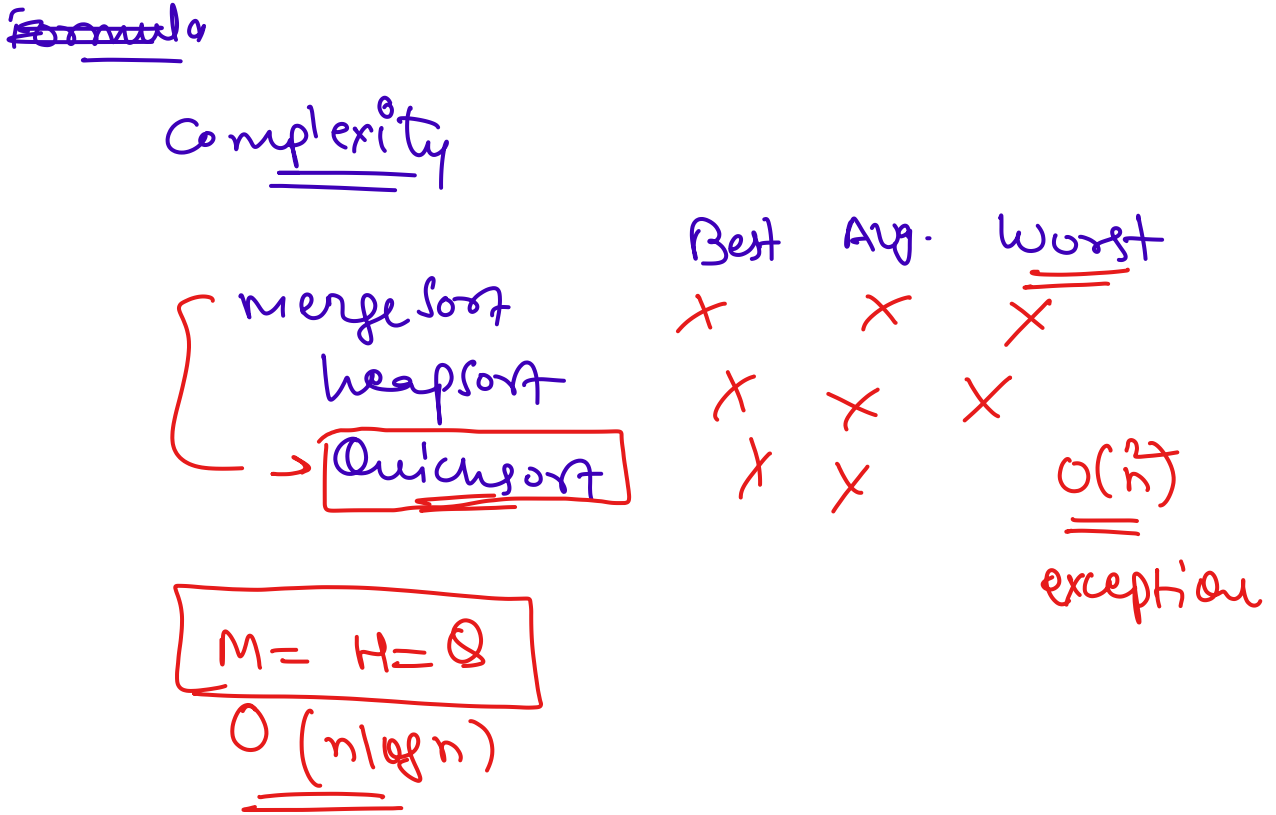
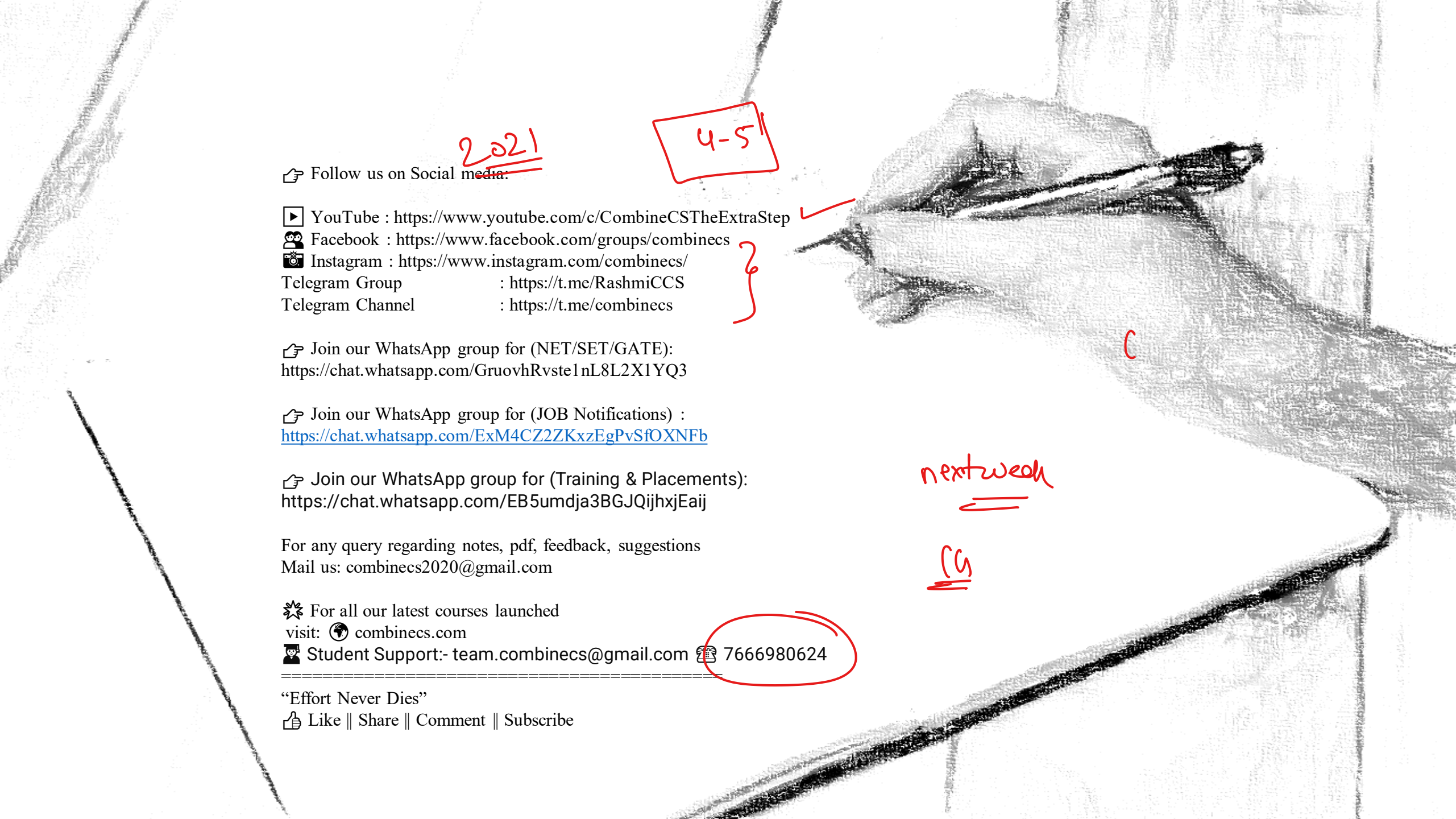
- Regular Graph
- Complete Graph
- Bipartite Graph





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