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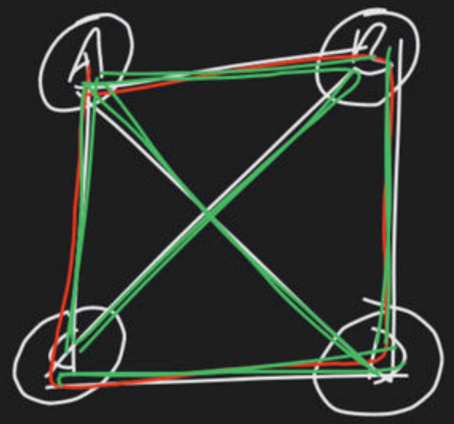
Dynamic Programming - Part XI

Complete Course on Algorithms - GATE

Subbarao Lingamgunta • Lesson 48 • May 16, 2023

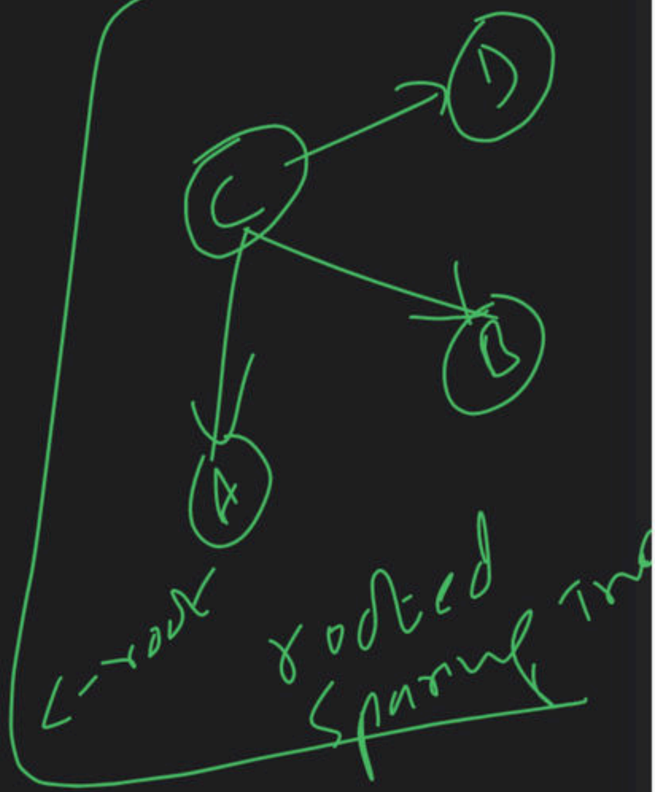
$6C_3 = 20 - 4 = 16$

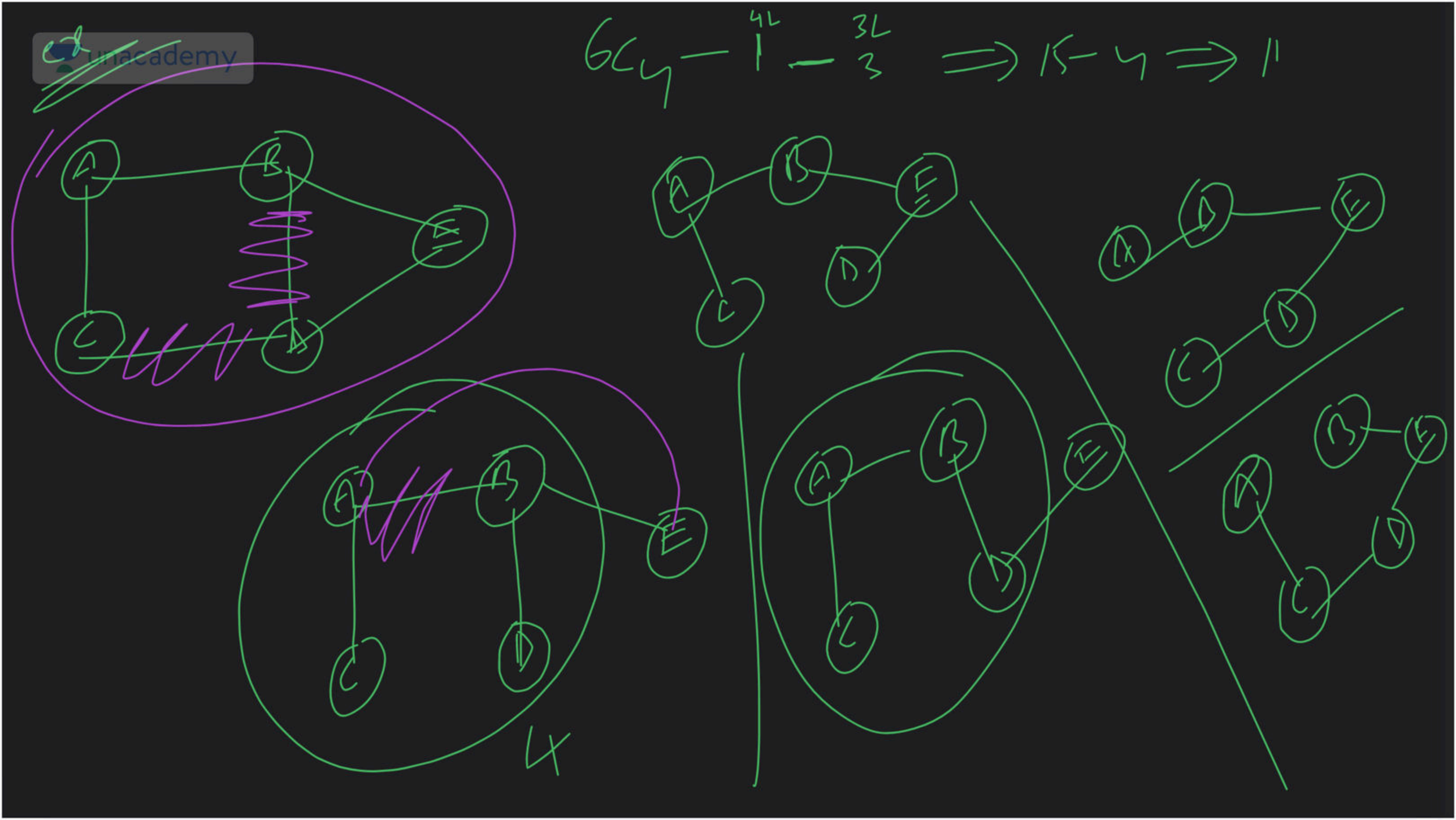


$ST(K_4) = 4^{4-2}$

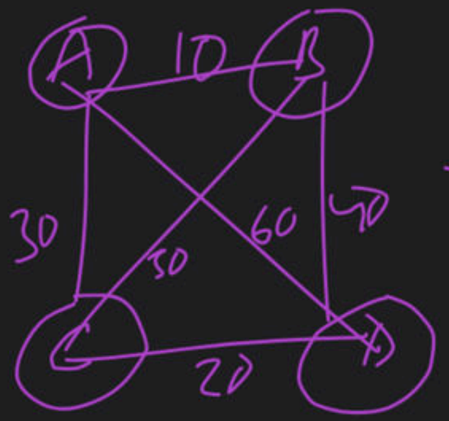
$= 4^2 = 16$

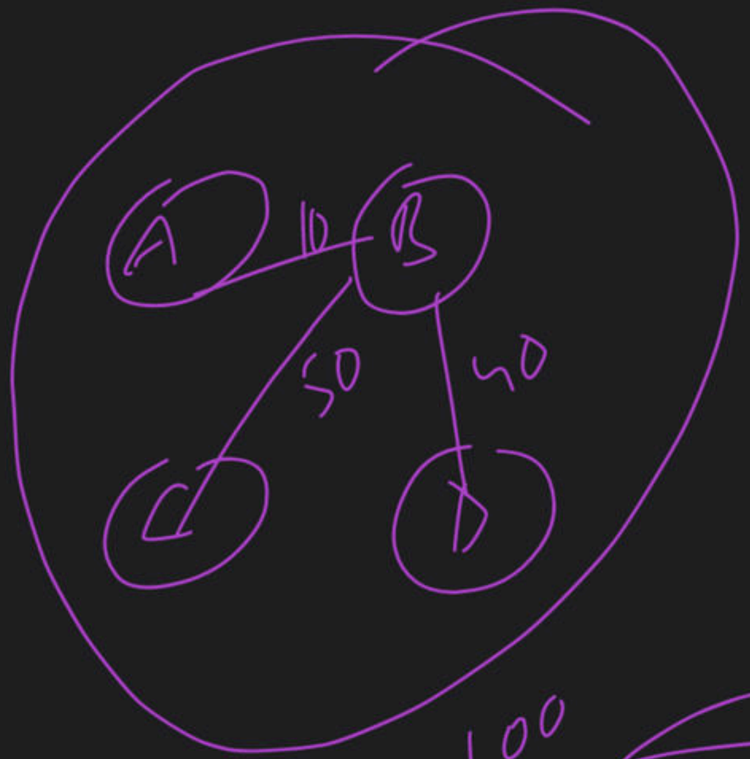
$ST(K_n) = n^{n-2}$




6C4 — 1 — 3
4L
3L
⇒ 15 − 4 ⇒ 11
A
B
C
D
E
4

MST

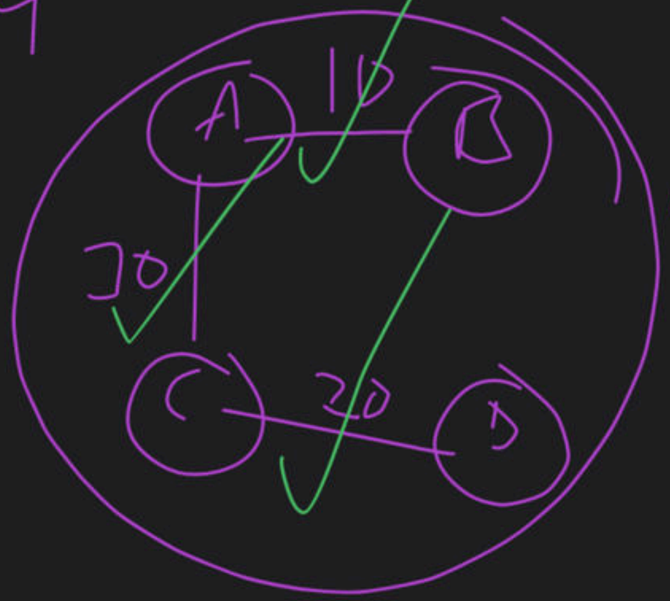




ST_1 MST ✓

ST_2 ... ST_{16}

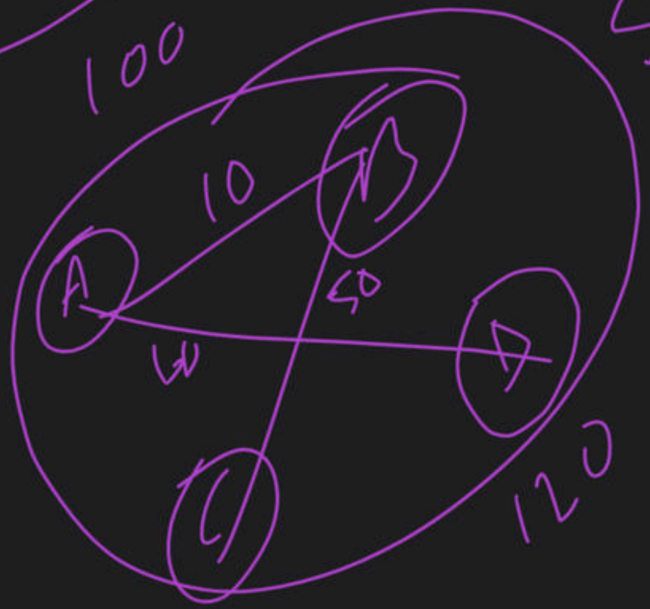
K4



G0

ST_3 MST ✓

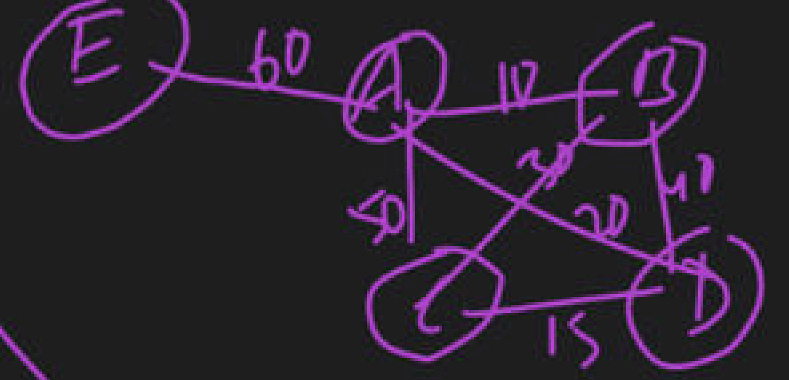
100



120

ST_4 MST ✓

Kruskal

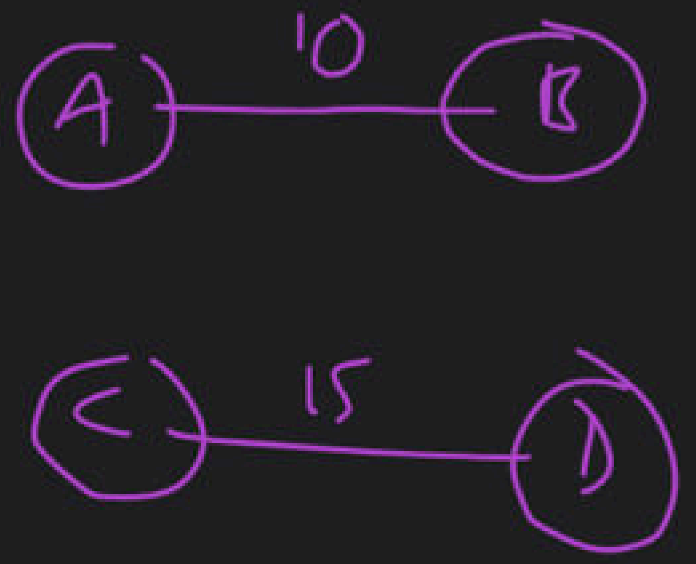


G(V, E)

① Take min-edge & add to MST

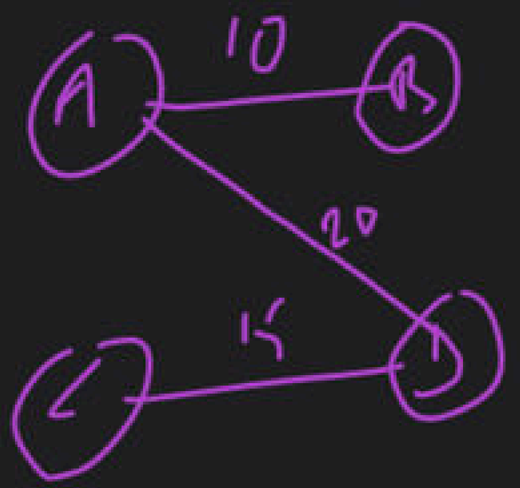
ElogE

② Take next min & add to MST



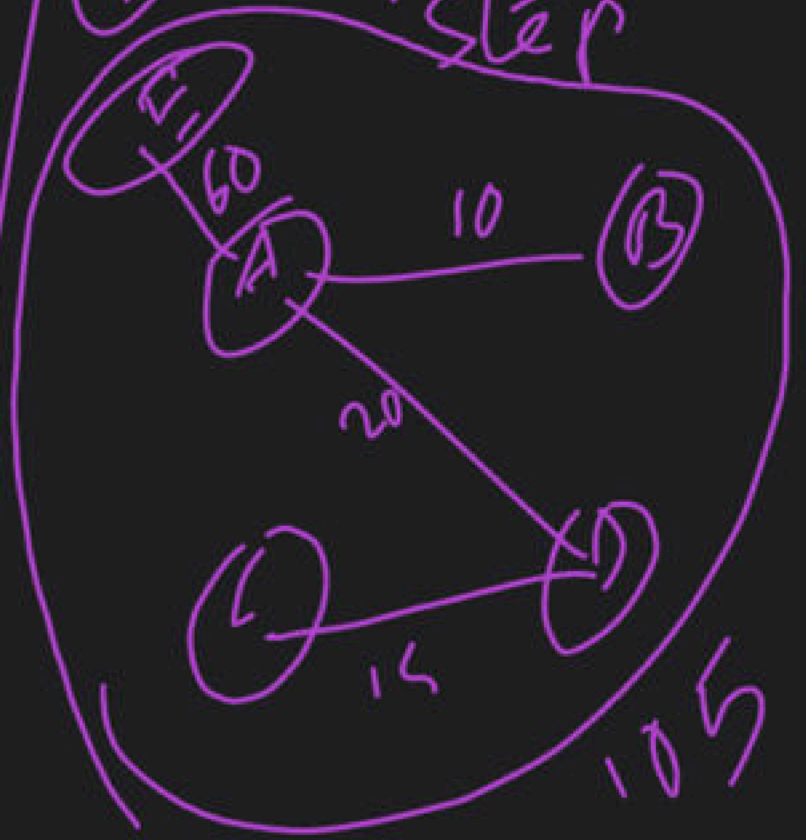
logE

③ Take next min & add MST if no-cycle



logE

④ repeat previous step



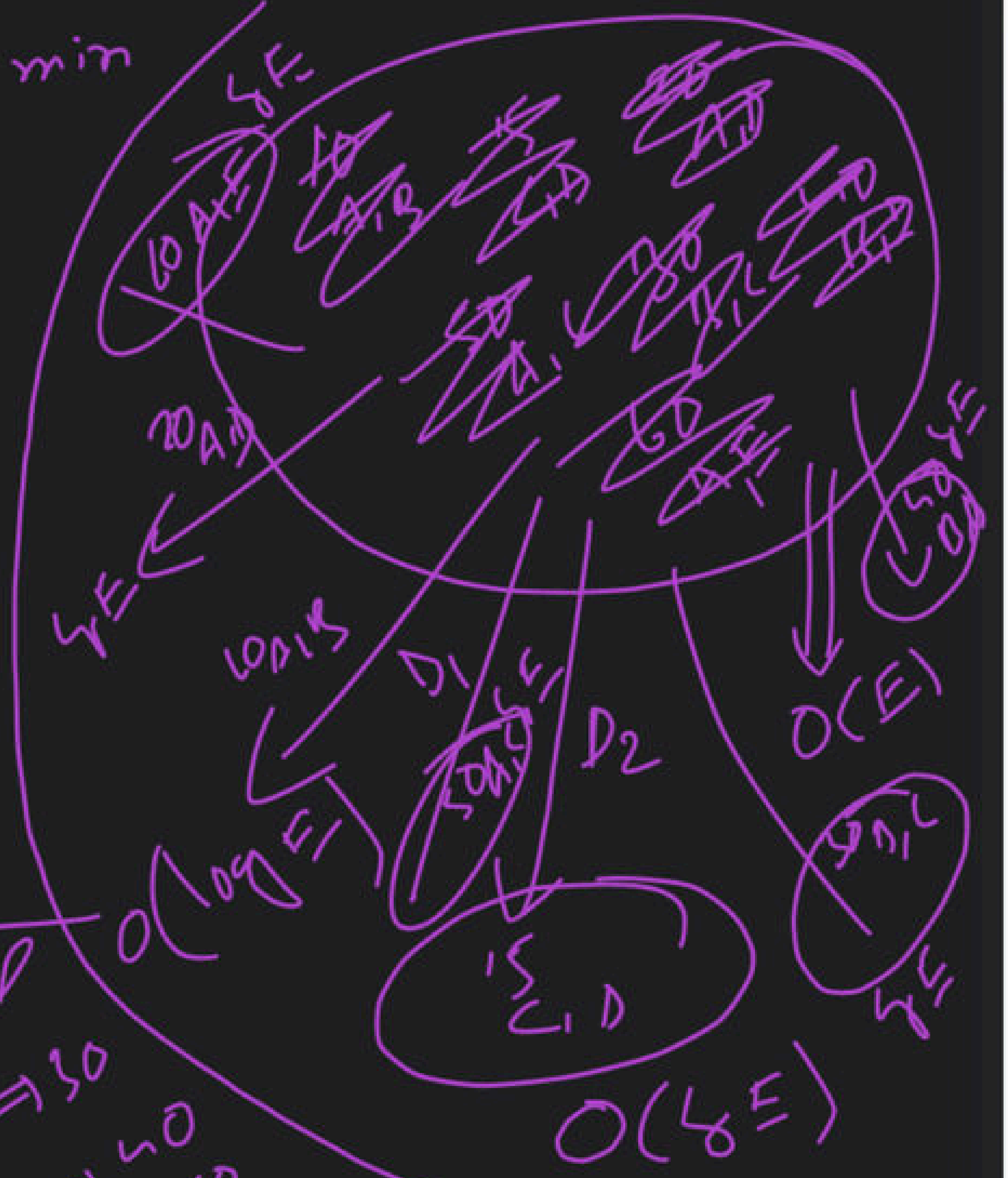
105

logE ⇒ 30

logE ⇒ 40

logE ⇒ 50

logE ⇒ 60



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TC – Kruskal

Prim's

$E + (V-1) * \log E$

$\Rightarrow E + V \log E$

$\Rightarrow E + V \log V$

$O(E + V \log V)$

Worst case

$E + E * \log E$

$\Rightarrow E \log E = O(E \log V)$

$\Downarrow$

$O(V^2 \log V)$

$E = O(V^2)$

$\log E = O(2 \log V)$

$\log E = O(\log V)$

Prims