unacademy

Dynamic Programming - Part IX

Complete Course on Algorithms - GATE

Subbarao Lingamgunta • Lesson 46 • May 15, 2023

① Huffman code

L-0 R-1

A-100 B-110 C-01 D-00

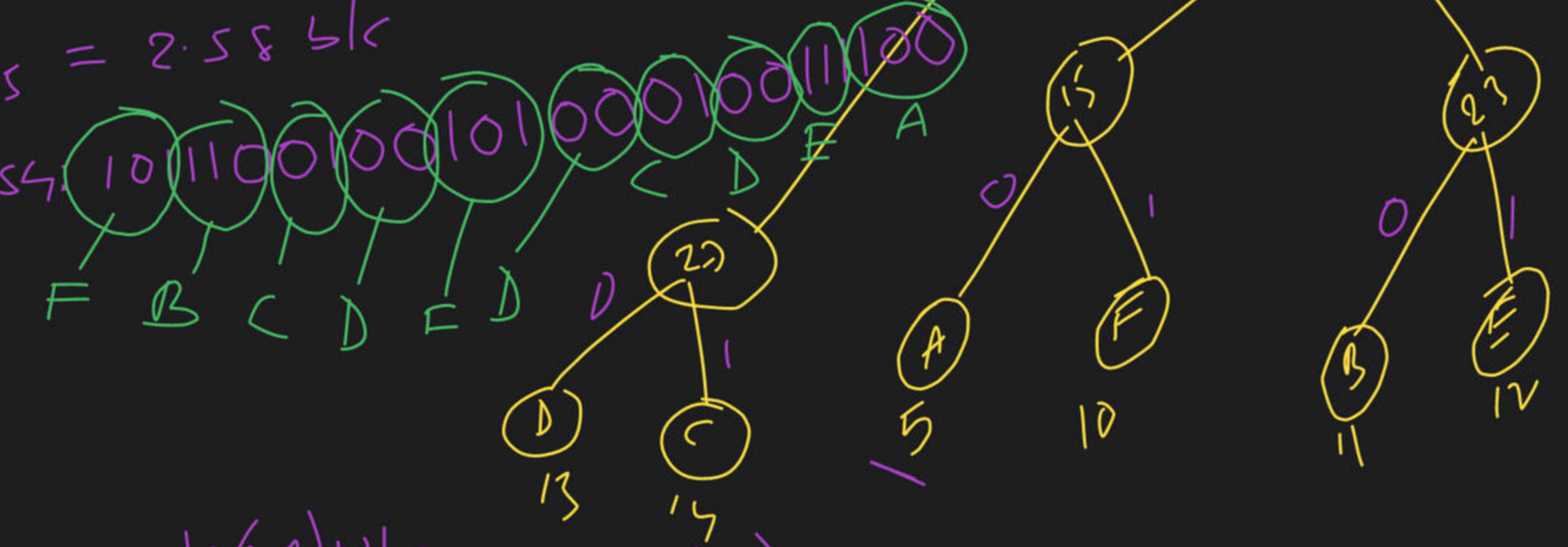
E-111 F-101

② Total Bit = 5b3 + 11b3 + 14b2 + 13b2 + 12b3 + 10b3 ⟹ 168

Avg = 168/65 = 2.58 b/c

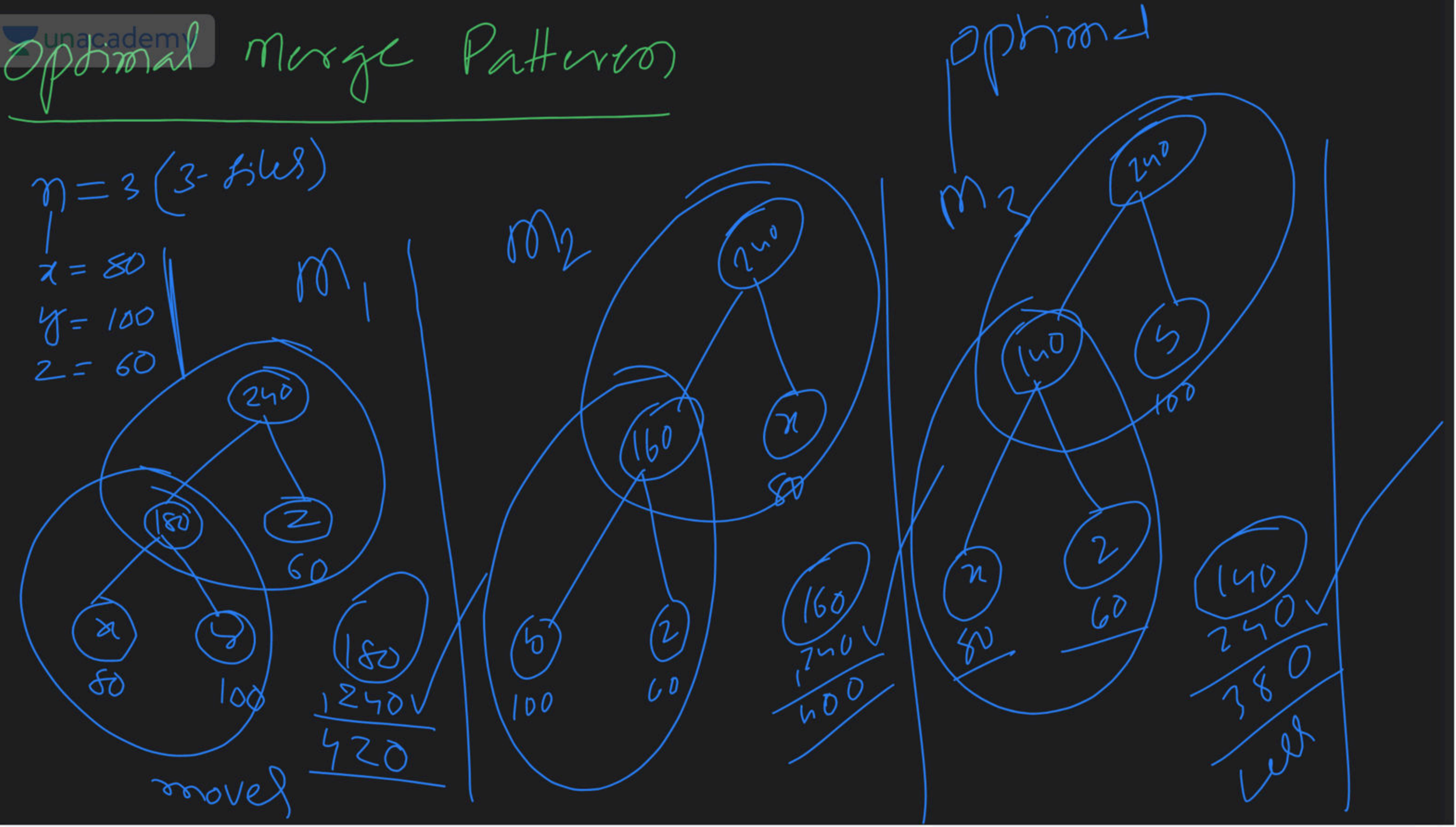
③ Encoded msg: 101110010010100011100

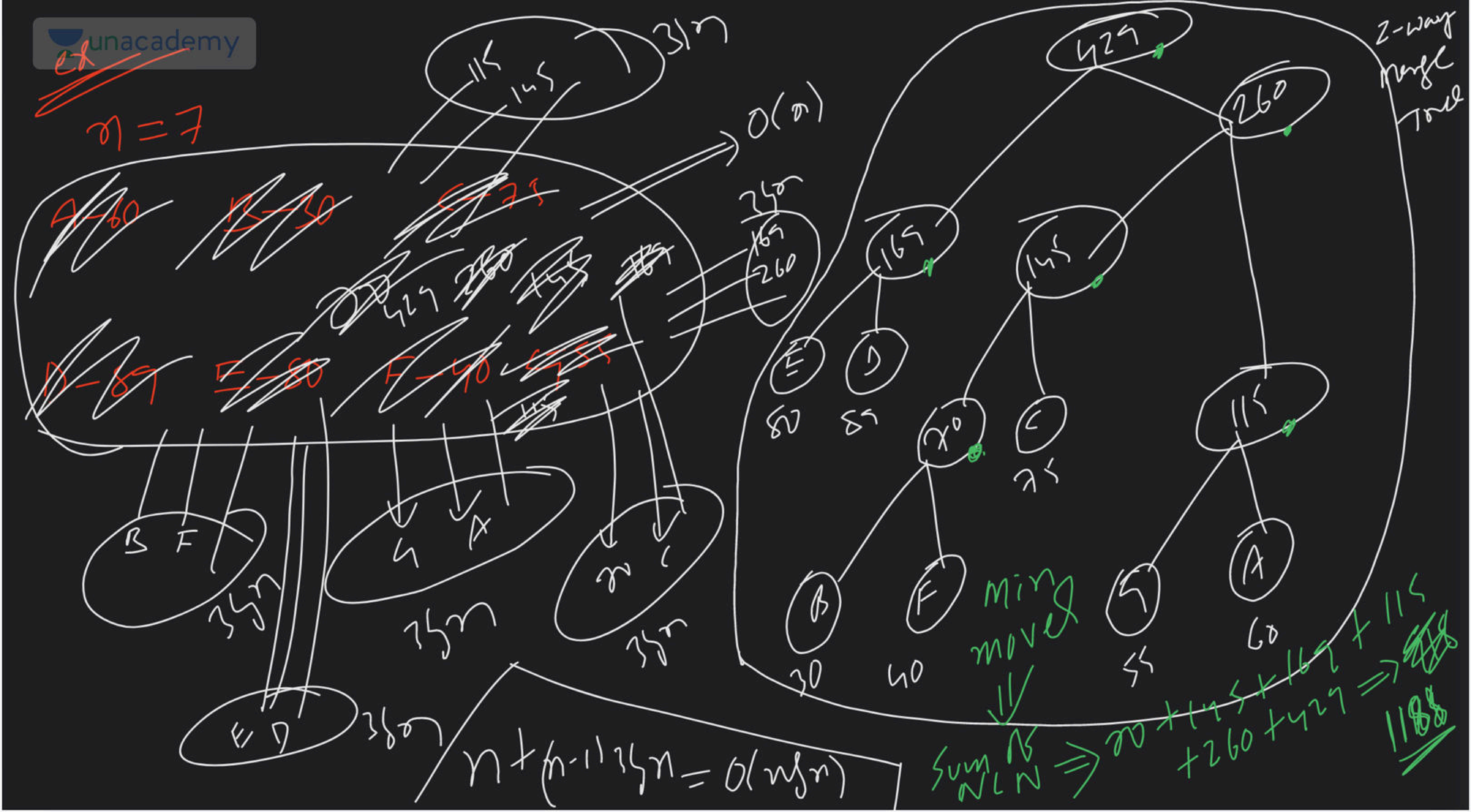
Decoded msg: F B C D E D D



n + (n-1) log n ⟹ O(n log n)

Optimal Merge Patterns

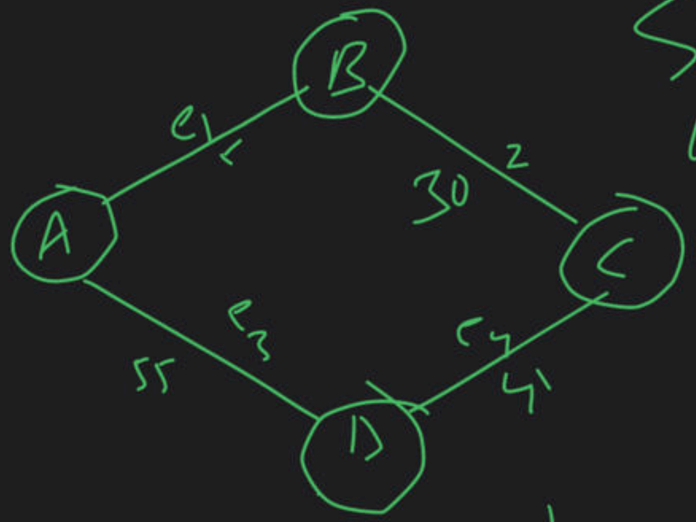




n = 7
A - 60
B - 30
C - 75
D - 85
E - 80
F - 40
G - 55
O(n)
3lgn
115
145
169
260
429
2-way Merge Tree
min move
sum of NLN ⇒ 70 + 145 + 169 + 115 + 260 + 429 ⇒ 1188
n + (n-1) 3lgn = O(nlgn)

Minimum Spanning Tree

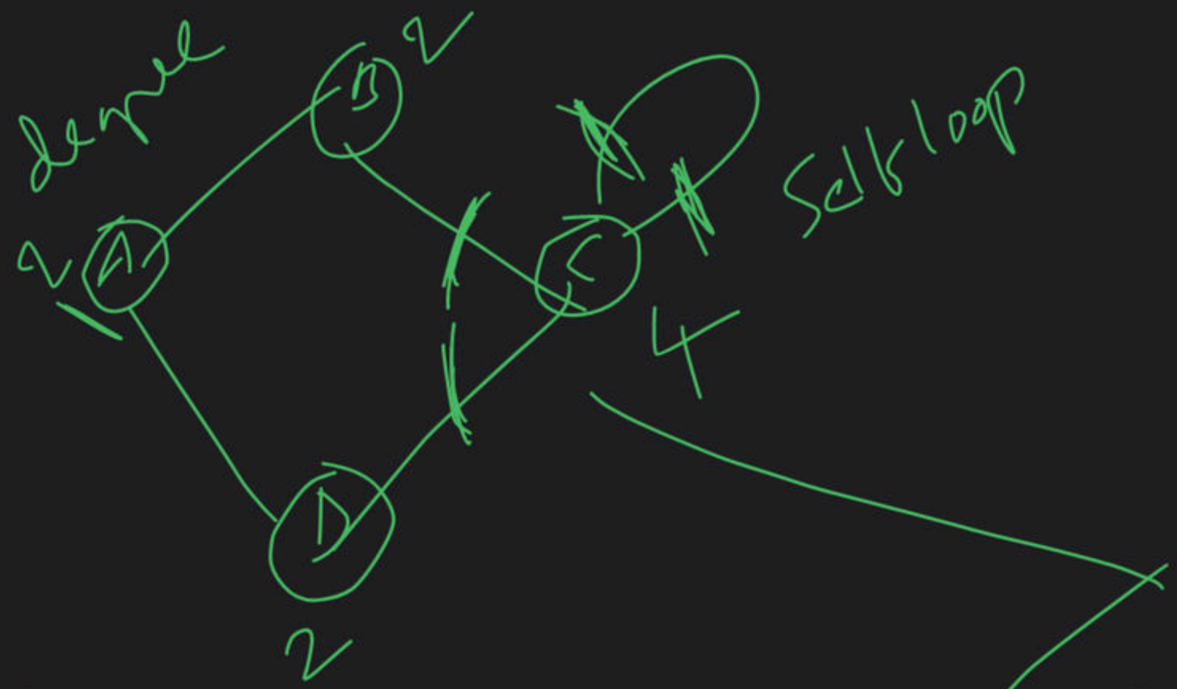
Graph $G = (V, E)$



Simple Graph

$V = \{A, B, C, D\}$

$E = \{e_1, e_2, e_3, e_4\}$



Multi Graph

Parallel edge