COMP 251 Assign 5

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1. Divide-and-Conquer - minimum spanning tree

$G = (V, E)$

$V - V_1$
$\quad - V_2$
$\}$ s.t. $|V_1| - |V_2| = 1$

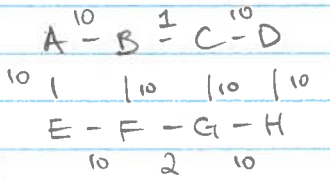
$E - E_1$ = set of edges incident only on vertices in V_1
$\quad - E_2$ = set of edges incident only on vertices in V_2

Minimum-spanning tree on
① $G_1 = (V_1, E_1)$
② $G_{12} = (V_2, E_2)$

Minimum-weight edge that crosses (V_1, V_2)
Use minimum-weight edge to unite two minimum spanning trees.

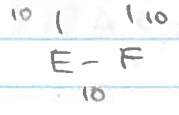
Result ① Algorithm is correct
② Algorithm fails ⇒ true

Given G

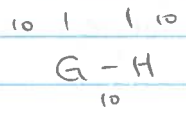


Divide G into G_1 and G_2 where $G_1 = \{A, B, E, F\}$
$G_2 = \{C, D, G, H\}$

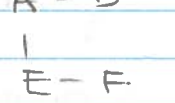
G_1



G_2

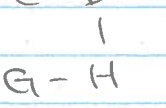


Minimum Spanning Tree of G_1 is



Cost = 30

Minimum Spanning Tree of G_2 is



Cost = 30