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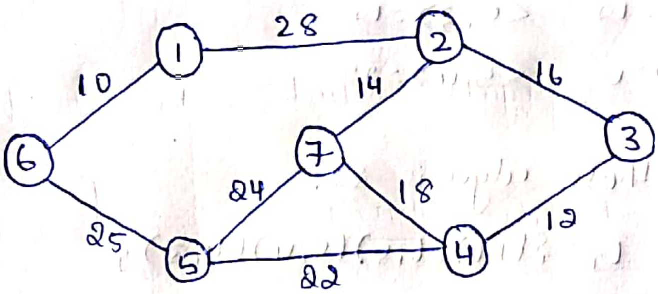
ADA Assignment

Find MST for the following graph using prim's algorithm.



The cost adjacency matrix for above graph is

$$\begin{array}{c|ccccccc} & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ \hline 1 & - & 28 & \infty & \infty & \infty & 10 & \infty \\ 2 & 28 & - & 16 & \infty & \infty & \infty & 14 \\ 3 & \infty & 16 & - & 12 & \infty & \infty & \infty \\ 4 & \infty & \infty & 12 & - & 22 & \infty & 18 \\ 5 & \infty & \infty & \infty & 22 & - & 25 & 24 \\ 6 & 10 & \infty & \infty & \infty & 25 & - & \infty \\ 7 & \infty & 14 & \infty & 18 & 24 & \infty & - \end{array}$$

$\langle 1,1\rangle = 0$
$\langle 1,2\rangle = 28$
$\langle 1,3\rangle = \infty$
$\langle 1,4\rangle = \infty$
$\langle 1,5\rangle = \infty$
$\langle 1,6\rangle = 10$
$\langle 1,7\rangle = \infty$

The least among these edges is 10.

$\therefore V_T = \{1, 6\}$ $E_T = \{(1,6)\}$

$\langle 1,1\rangle = 0$
$\langle 1,2\rangle = 28$
$\langle 1,3\rangle = \infty$
$\langle 1,4\rangle = \infty$
$\langle 1,5\rangle = \infty$
$\langle 1,7\rangle = \infty$
$\langle 6,2\rangle = \infty$
$\langle 6,3\rangle = \infty$
$\langle 6,4\rangle = \infty$
$\langle 6,5\rangle = 25$
$\langle 6,6\rangle = 0$
$\langle 6,7\rangle = \infty$

The least among these edges is 25

$\therefore V_T = \{1, 6, 5\}$ $E_T = \{(1,6)(6,5)\}$

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$\langle 1,1\rangle=0$	$\langle 1,7\rangle=\infty$	$\langle 6,7\rangle=\infty$	$\langle 5,5\rangle=0$
$\langle 1,2\rangle=28$	$\langle 6,2\rangle=\infty$	$\langle 5,1\rangle=\infty$	$\langle 5,7\rangle=24$
$\langle 1,3\rangle=\infty$	$\langle 6,3\rangle=\infty$	$\langle 5,2\rangle=\infty$	
$\langle 1,4\rangle=\infty$	$\langle 6,4\rangle=\infty$	$\langle 5,3\rangle=\infty$	
$\langle 1,5\rangle=\infty$	$\langle 6,6\rangle=0$	$\langle 5,4\rangle=22$	

The least among those edges is 22.

$\therefore V_T=\{1,6,5,4\}$ $E_T=\{(1,6)(6,5)(5,4)(4,3)\}$

$\langle 1,1\rangle=0$	$\langle 1,7\rangle=\infty$	$\langle 6,7\rangle=\infty$	$\langle 5,7\rangle=24$	$\langle 4,7\rangle=18$	$\langle 3,6\rangle=\infty$
$\langle 1,2\rangle=28$	$\langle 6,2\rangle=\infty$	$\langle 5,1\rangle=\infty$	$\langle 4,1\rangle=\infty$	$\langle 3,1\rangle=\infty$	$\langle 3,7\rangle=\infty$
$\langle 1,3\rangle=\infty$	$\langle 6,3\rangle=\infty$	$\langle 5,2\rangle=\infty$	$\langle 4,2\rangle=\infty$	$\langle 3,2\rangle=16$	
$\langle 1,4\rangle=\infty$	$\langle 6,4\rangle=\infty$	$\langle 5,3\rangle=\infty$	$\langle 4,4\rangle=0$	$\langle 3,3\rangle=0$	
$\langle 1,5\rangle=\infty$	$\langle 6,6\rangle=0$	$\langle 5,5\rangle=0$	$\langle 4,6\rangle=\infty$	$\langle 3,5\rangle=\infty$	

The least among those edges is 16.

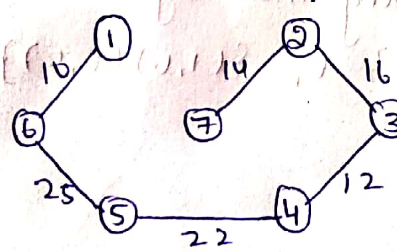
$\therefore V_T=\{1,6,5,4,3,2\}$ $E_T=\{(1,6)(6,5)(5,4)(4,3)(3,2)\}$

$\langle 1,1\rangle=0$	$\langle 6,2\rangle=\infty$	$\langle 5,2\rangle=\infty$	$\langle 4,4\rangle=0$	$\langle 3,6\rangle=\infty$	$\langle 2,6\rangle=\infty$
$\langle 1,2\rangle=28$	$\langle 6,3\rangle=\infty$	$\langle 5,3\rangle=\infty$	$\langle 4,6\rangle=\infty$	$\langle 3,7\rangle=\infty$	$\langle 2,7\rangle=14.$
$\langle 1,3\rangle=\infty$	$\langle 6,4\rangle=\infty$	$\langle 5,5\rangle=0$	$\langle 4,7\rangle=18$	$\langle 2,1\rangle=28$	
$\langle 1,4\rangle=\infty$	$\langle 6,6\rangle=0$	$\langle 5,7\rangle=24$	$\langle 3,1\rangle=\infty$	$\langle 2,2\rangle=0$	
$\langle 1,5\rangle=\infty$	$\langle 6,7\rangle=\infty$	$\langle 4,1\rangle=\infty$	$\langle 3,3\rangle=0$	$\langle 2,4\rangle=\infty$	
$\langle 1,7\rangle=\infty$	$\langle 5,1\rangle=\infty$	$\langle 4,2\rangle=\infty$	$\langle 3,5\rangle=\infty$	$\langle 2,5\rangle=\infty$	

The least among those edges is 14.

$\therefore V_T=\{1,6,5,4,3,2,7\}$ $E_T=\{(1,6)(6,5)(5,4)(4,3)(3,2)(2,7)\}$

$\therefore$ The Minimum Cost Spanning tree is



The minimum cost is

$\Rightarrow 10+25+22+12+16+14$

$\Rightarrow 99$ units//.