CO323 : Computer Communication Networks II Assignment

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1. **128.119.40.128/26**

   IP range -> 128.119.40.128/26 - 128.119.40.191/26

   One IP -> 128.119.40.130/26

   128.119.40.64/26

#	Network ID	Subnet Mask	Host ID Range	No. of Usable Host	Broadcast ID
1	128.119.40.64	/28	128.119.40.65 - 128.119.40.78	14	128.119.40.79
2	128.119.40.80	/28	128.119.40.81 - 128.119.40.94	14	128.119.40.95
3	128.119.40.96	/28	128.119.40.97 - 128.119.40.110	14	128.119.40.111
4	128.119.40.112	/28	128.119.40.113 - 128.119.40.126	14	128.119.40.127

2. **223.1.17.0/24**

#	Network ID	Subnet Mask	Host ID Range	No. of Usable Host	Broadcast ID
1	223.1.17.0	/25	223.1.17.1 - 223.1.17.126	126	223.1.17.127
2	223.1.17.128	/26	223.1.17.129 - 223.1.17.190	62	223.1.17.191
3	223.1.17.192	/28	223.1.17.193 - 223.1.17.206	14	223.1.17.207

3.

Size of one datagrams = 1500 bytes

IP header size = 20 bytes

Actual data size containing in one datagrams = 1480 bytes

MP3 size = 5000000 bytes

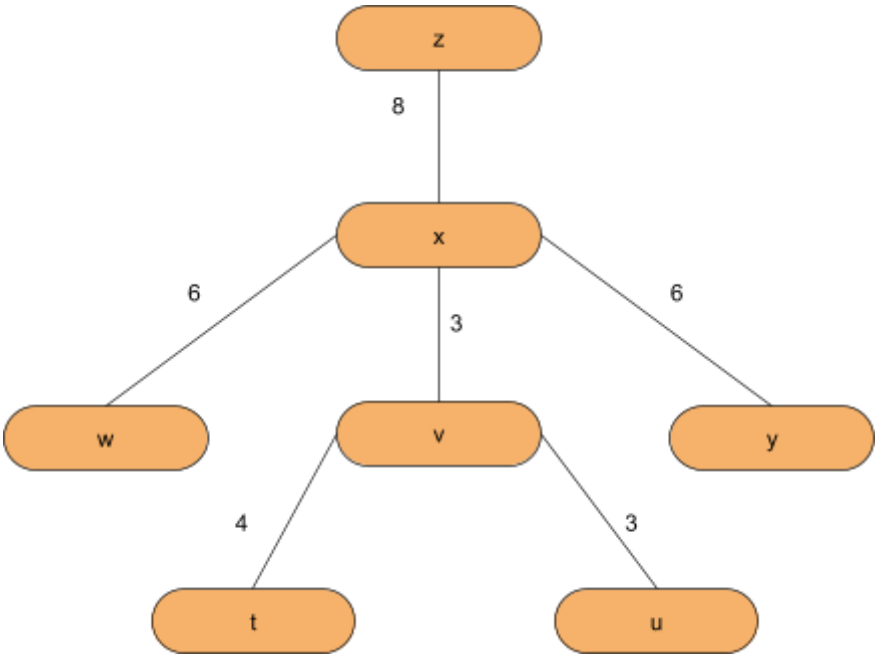
Number of datagrams required to send MP3 = 5000000 / 1480

= 3378.38

= 3379

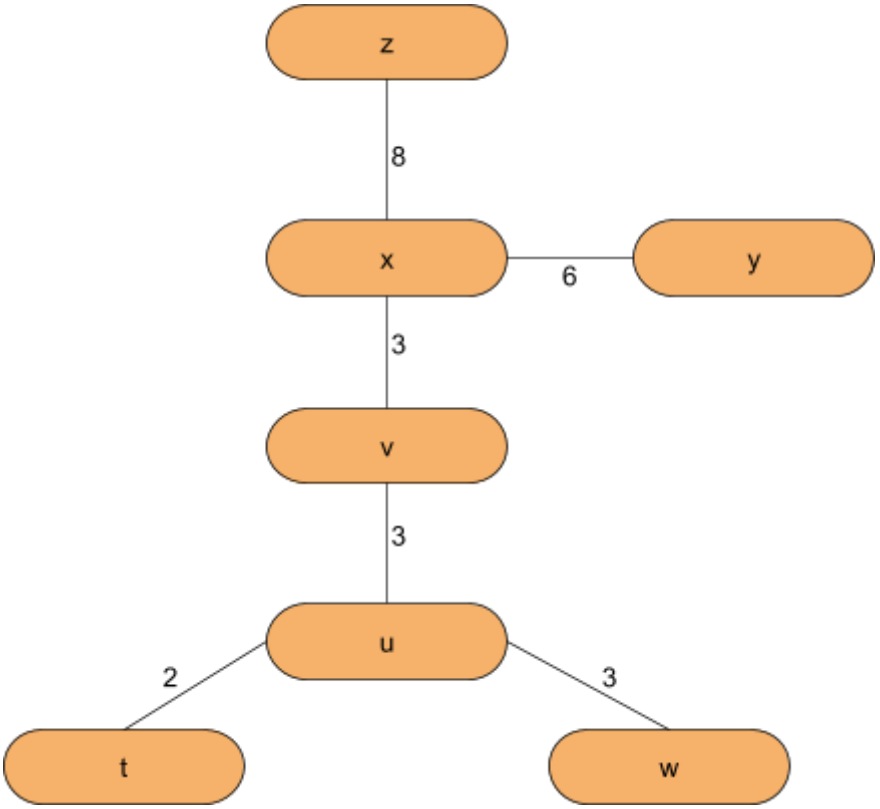
4.

Step	N	D(v) p(v)	D(w) p(w)	D(y) p(y)	D(z) p(z)	D(u) p(u)	D(t) p(t)
0	x	3,x	6,x	6,x	8,x	∞	∞
1	xv		6,x	6,x	8,x	6,v	7,v
2	xvw			6,x	8,x	6,v	7,v
3	xvwy				8,x	6,v	7,v
4	xvwyz					6,v	7,v
5	xvwyzu						7,v
6	xvwyzut						



5.

step	(u,x)	(T)
Initial	-	{ x }
1	{ x , v }	{ x , v }
2	{ v , u }	{ x , v , u }
3	{ u , t }	{ x , v , u , t }
4	{ u , w }	{ x , v , u , t , w }
5	{ x , y }	{ x , v , u , t , w, y }
6	{ x , z }	{ x , v , u , t , w, y , z }



1. Dijsktra's algorithm finds the minimum distance from node i to all nodes (you specify i). So in return you get the minimum distance tree from node i. Prim's algorithm gets you the minimum spanning tree for a given graph. A tree that connects all nodes while the sum of all costs is the minimum possible.
2. Prim's algorithm stores a minimum cost edge whereas Dijkstra's algorithm stores the total cost from a source vertex to the current vertex.
3. The shortest path tree is not guaranteed to be a minimum spanning tree, and the cost of building such a tree could be much larger than the cost of an MST.
4. Prim's algorithm works on undirected graphs only, since the concept of an MST assumes that graphs are inherently undirected. Dijkstra's algorithm will work fine on directed graphs. since shortest path trees can indeed be directed.

6. The only difference is that Dijkstra's algorithm cannot handle negative edge weights which Bellman-ford handles.And bellman-ford also tells us whether the graph contains negative cycle. If graph doesn't contain negative edges then Dijkstra's is always better.An efficient alternative for Bellman-ford is Directed Acyclic Graph (DAG) which uses topological sorting.