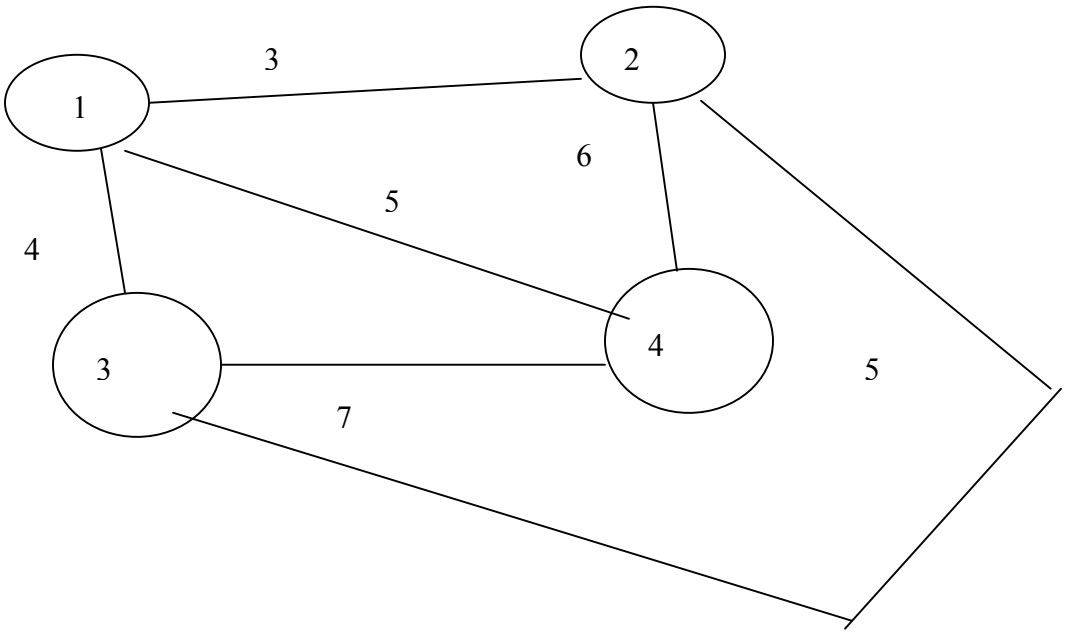
MINIMUM SPANNING TREES
KRUSKAL'S ALGORITHM

COMPLEXITY
$T(n) = O(e\ \alpha(e))$
$=O(e)$ practically
$e \leq n^2$ is number of edges

Consider a undirected graph of four vertices, v_i, $1<=i<=4$, with edge (vi, vj) having a weight of i+j, for I not =j.

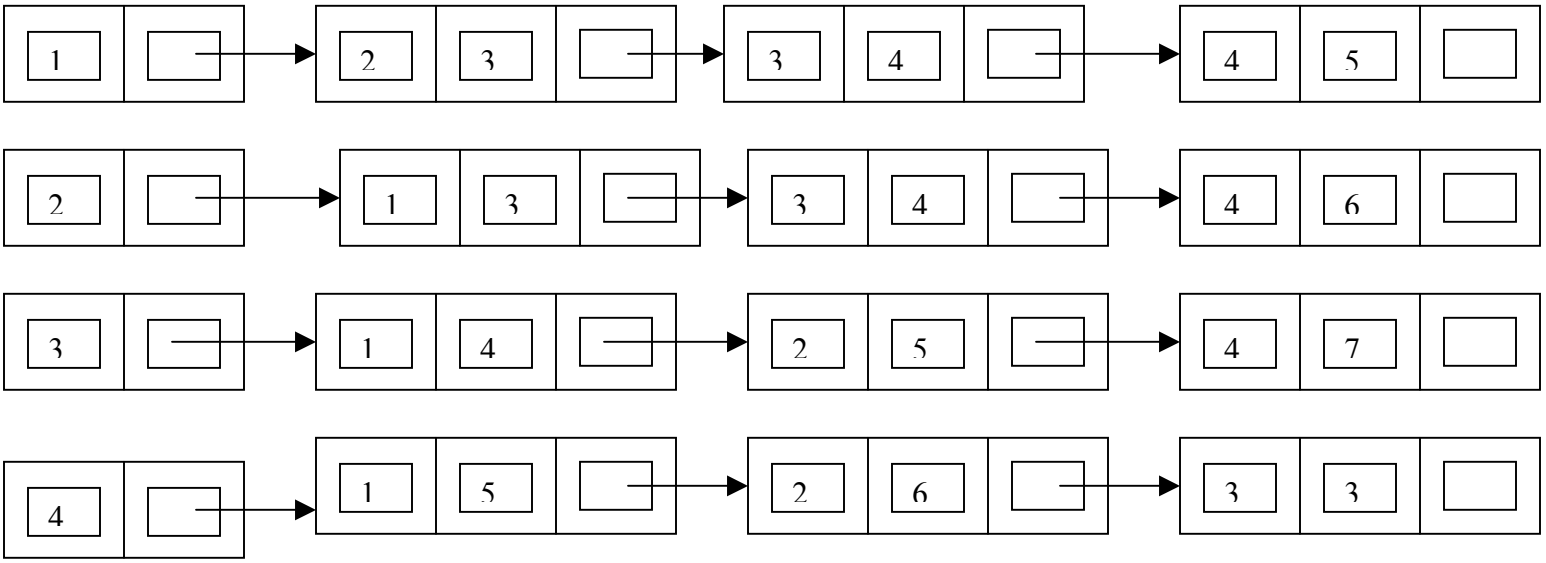
Pictorial view of the graph:



ADJACENCY MATRIX REPRESENTATION OF THE GRAPH

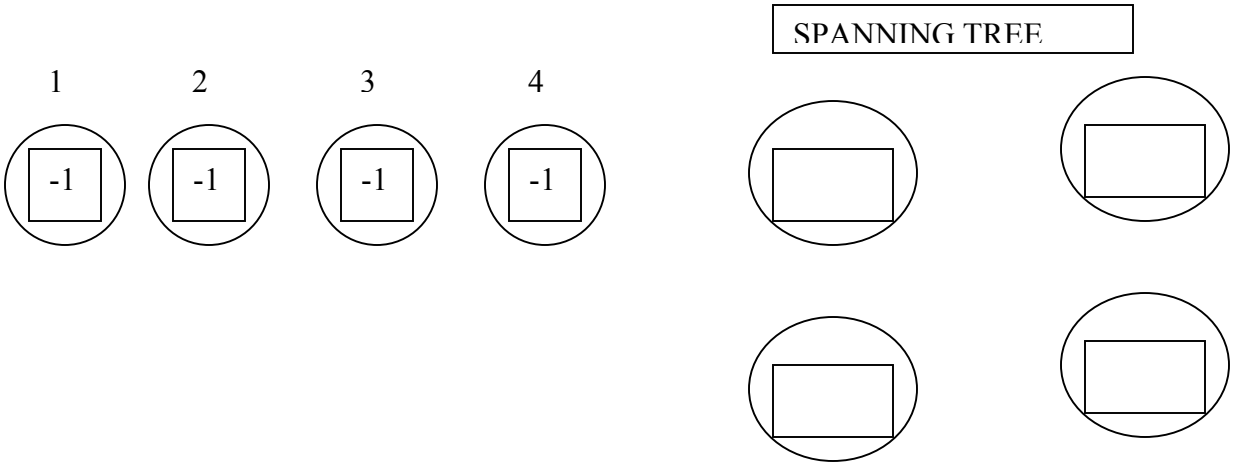
	1	2	3	4
1	∞	3	4	5
2	3	∞	5	6
3	4	5	∞	7

ADJACENCY LIST REPRESENTATION OF THE GRAPH



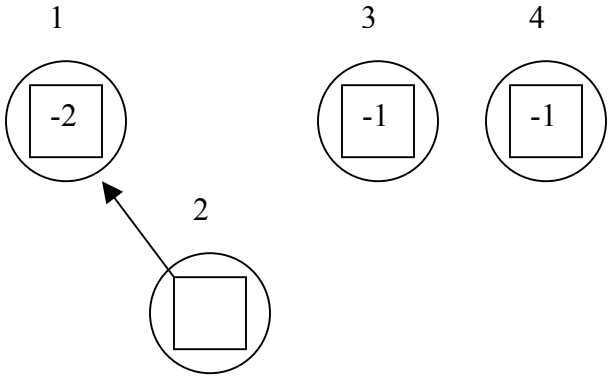
KRUSKAL'S ALGORITHM TO FIND THE MINIMUM SPANNING TREE

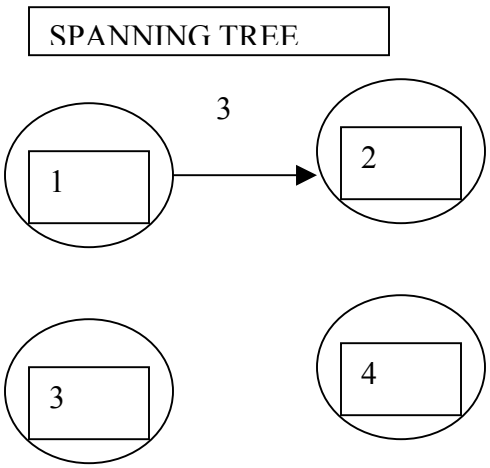
Consider the edges in nonincresing order.



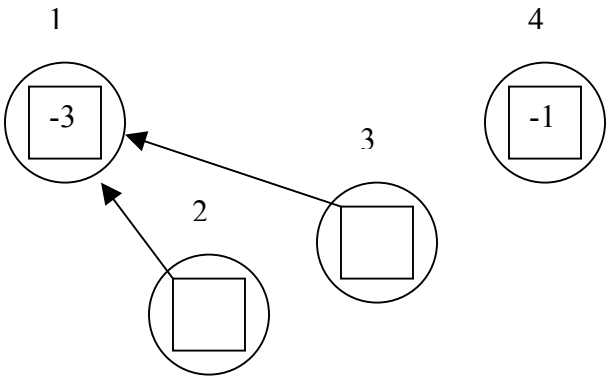
Least cost edge is cost(1,2) = 3.

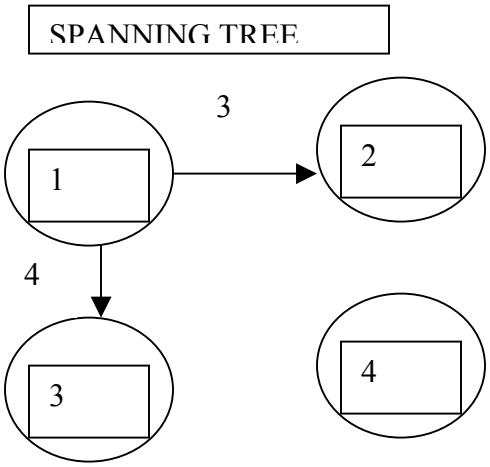
F(1), F(2)…1 and 2 are in different sets so we take U(1,2)





Next minimum cost edge, cost(1,3) = 4
F(1), F(3) as 1 and 3 are in different sets we take U(1,3)





Next minimum cost edge is cost (2,3) = 5
F(2), F(3)…..both are in the same set 1, so reject this edge.

The next minimum cost edge is cost(1,4) = 5
F(1), F(4)….they are in different set so U(1,4) is performed.