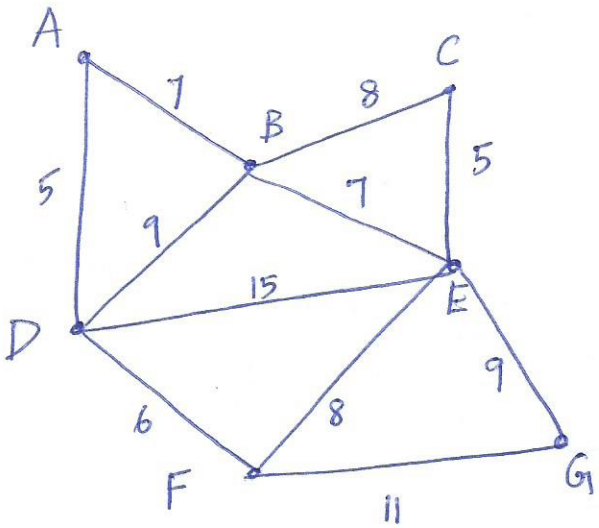
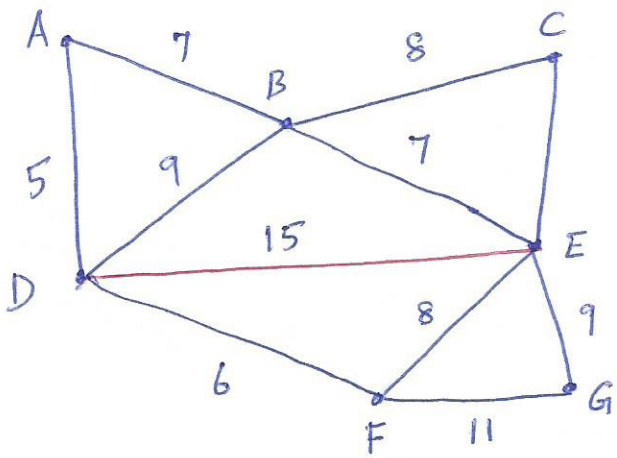
Reverse delete algorithm



This is the original graph. The numbers near the edges indicate the edge weight.

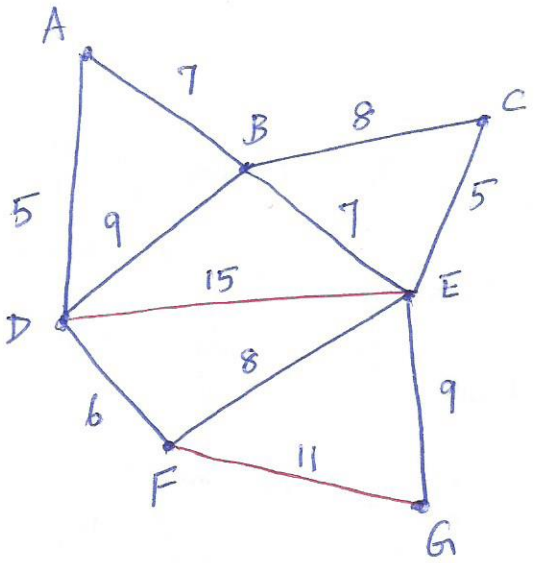
Let this be the initial Graph $G_1 = (V, E)$

Step 1: Start with maximum weighted edge. Here, it is DE with edge weight of 15. Delek the edge DE since it does not disconnect the entire graph.



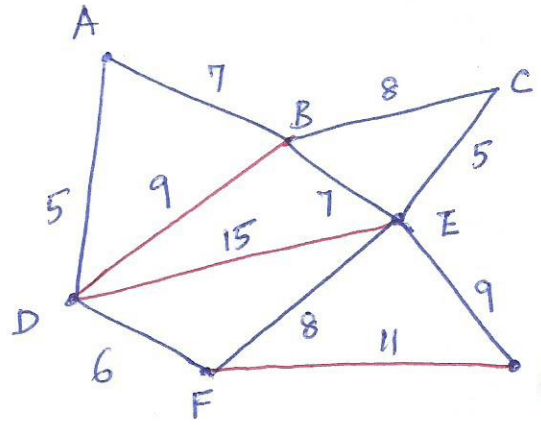
Step 2: The next largest edge is FG. The algorithm will check if by deleting this edge will further disconnect the graph.

Edge is now deleted.

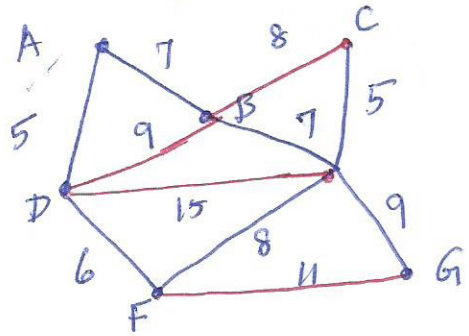


Let this be the graph after ~~nodes~~ edges DE, FG are deleted.

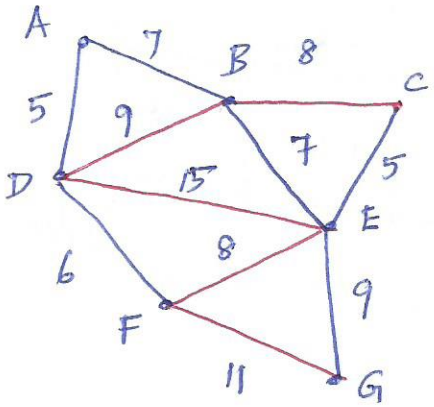
Step 3: The next largest edges are BD and EG. First consider BD. Since deleting BD does not disconnect the graph, the algorithm will check & delete this edge



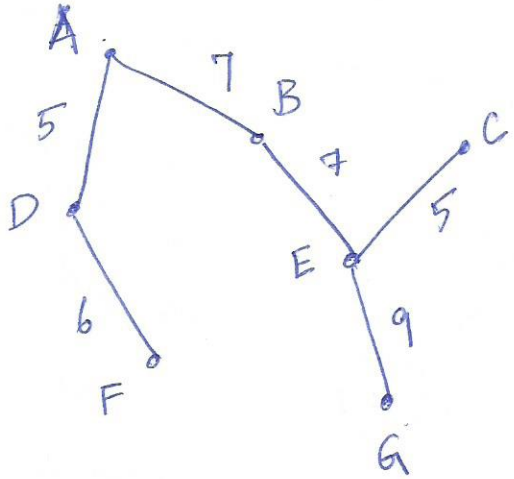
Step 4: The next largest edge is EG. This will not be deleted since it would disconnect node G from the graph. Therefore, the next edge to delek is edge BC.



Step 5: The next largest edge is edge EF. So the algorithm will check this edge and delete it.



Step 6: The algorithm searches for the remaining edges and will not find another edge to delete since doing so will disconnect the nodes from the graph G. Therefore, the final graph returned by the algorithm is



Huffman coding algorithm Example

Construct a Huffman tree by using these nodes:

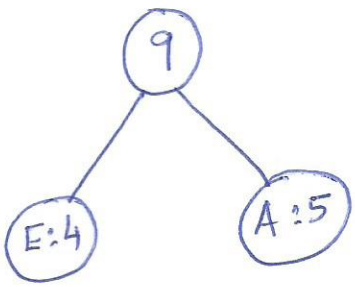
Value	A	B	C	D	E	F
Frequency	5	25	7	15	4	12

Solution: Arrange all elements in the ascending order of frequencies:

Value	E	A	C	F	D	B
Frequency	4	5	7	12	15	25

Step 1: Insert first two elements which have smaller frequency

Step 2:

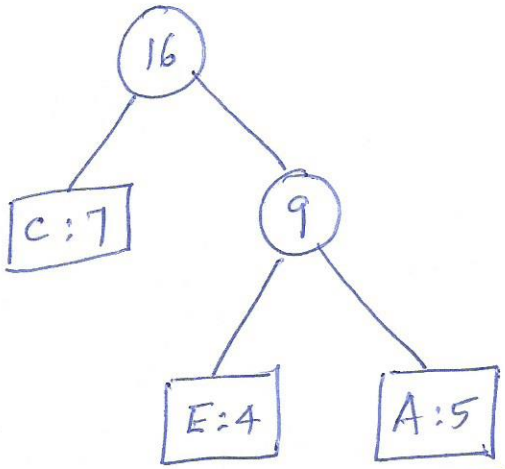


Then again order them in the table in ascending order with a new node

EA : 9

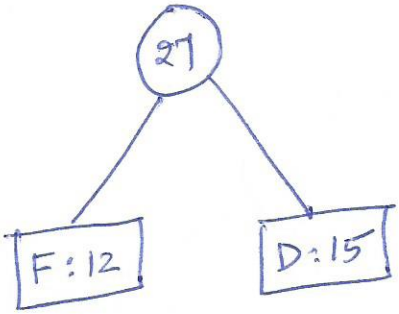
Value	C	EA	F	D	B
Frequency	7	9	12	15	25

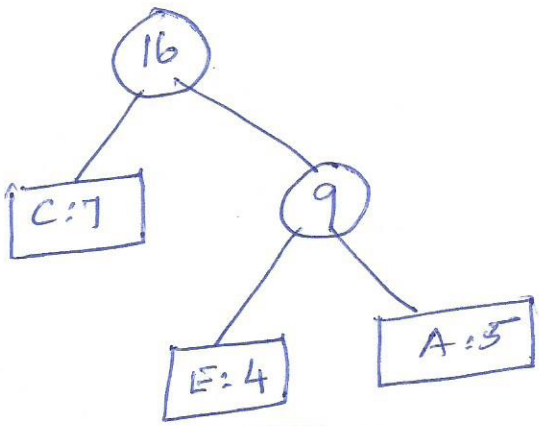
Step 3 : Taking the next smaller number and inserting it at the correct place.



Value	F	D	CEA	B
Frequency	12	15	16	25

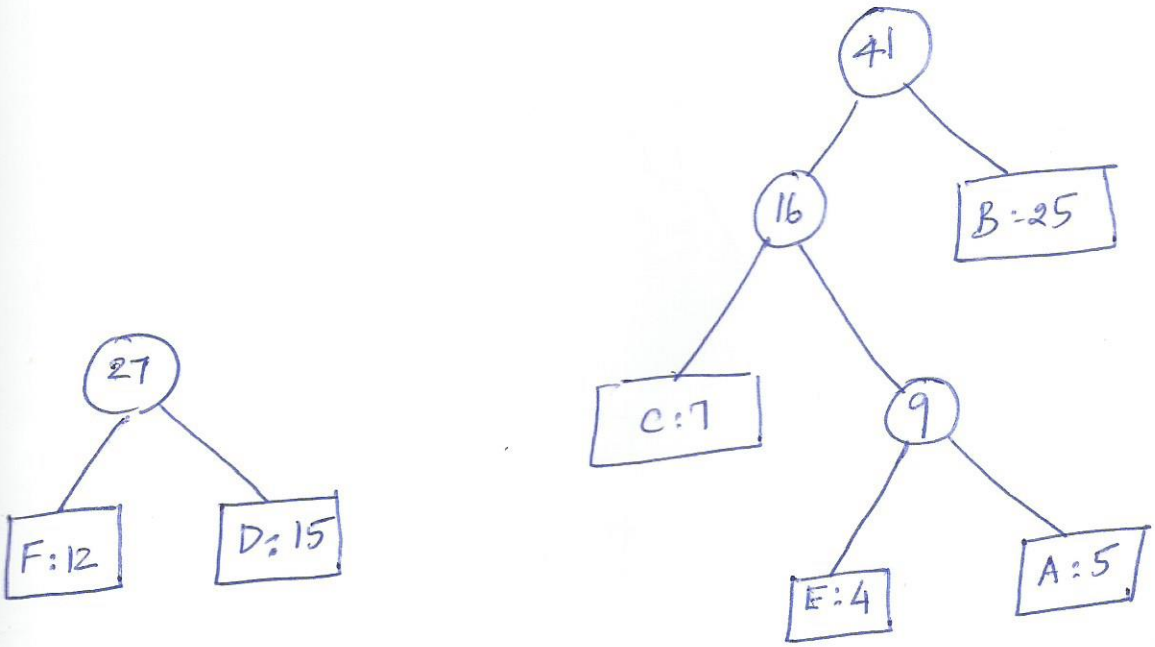
Step 4 : Next two elements are F and D. So, we construct another subtree for F and D.





Value	CEA	B	FD
Frequency	16	25	27

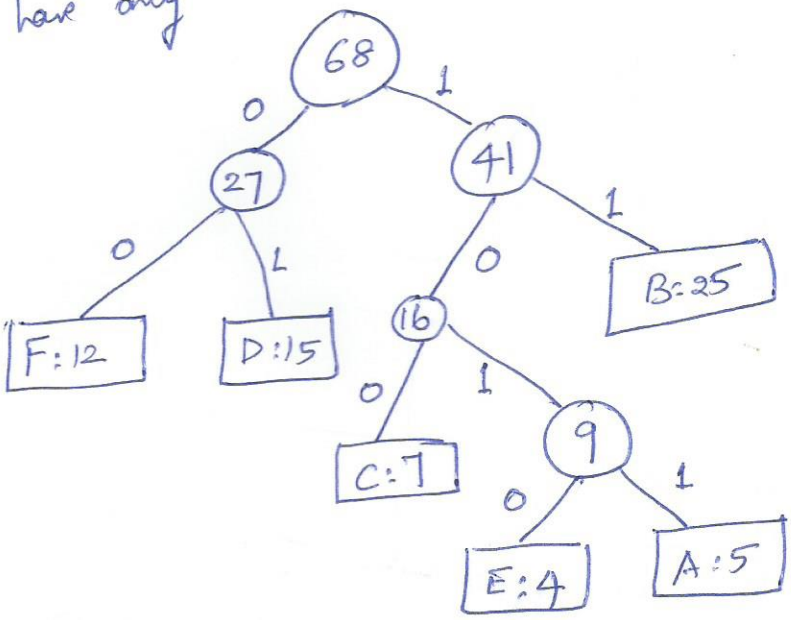
Step 5: Taking next value having smaller frequency and then adding it with CEA and inserting it at the correct place.



Value	FD	CEAB
Frequency	27	41

Step 6: We now have only two values. Combine them by adding them.

Huffman tree



Huffman tree

Value	FDCEAB
Frequency	68

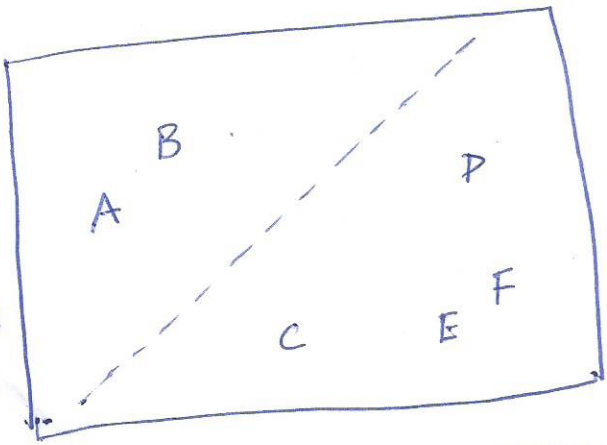
Dendrogram Example

A Dendrogram is a diagram showing hierarchical relationship between objects. It is commonly used in hierarchical clustering.

Which is the best way to allocate objects to clusters?

[A]

Look at the proximity of the observations and combine them together.



First, E and F are combined.
Then D combines with E & F.
Then C is combined with D, E and F.