

Homework 6 for EECS 340

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1 Warm-Up

a R-15.1

Draw a simple, connected, undirected, weighted graph with 8 vertices and 16 edges, each with unique edge weights. Illustrate the execution of Kruskal's algorithm on this graph. (Note that there is only one minimum spanning tree for this graph.)

Answer: The sequence of Kruskal algorithm is shown as Fig.1 through Fig.8.

b R-18.3

Give an example of a graph G with at least 10 vertices such that the greedy 2-approximation algorithm for VERTEX-COVER given above is guaranteed to produce a suboptimal vertex cover.

Answer:

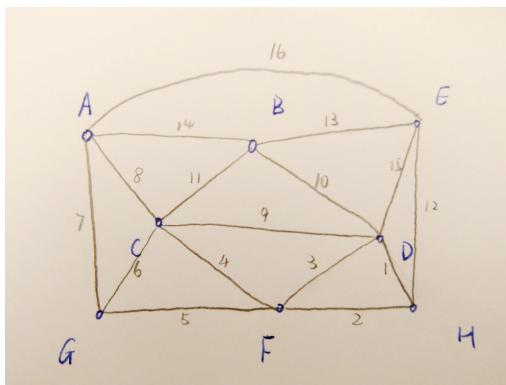
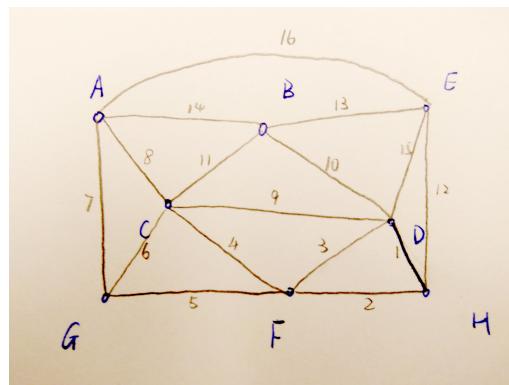
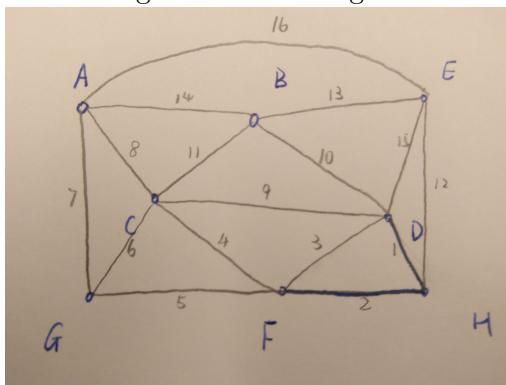
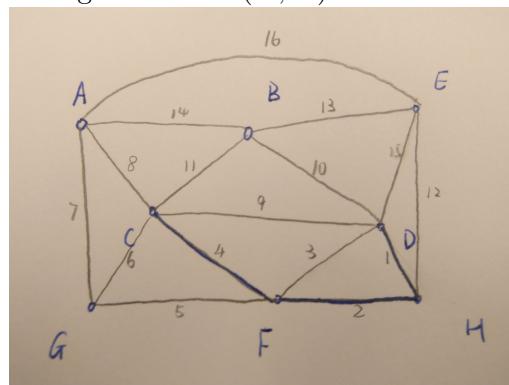
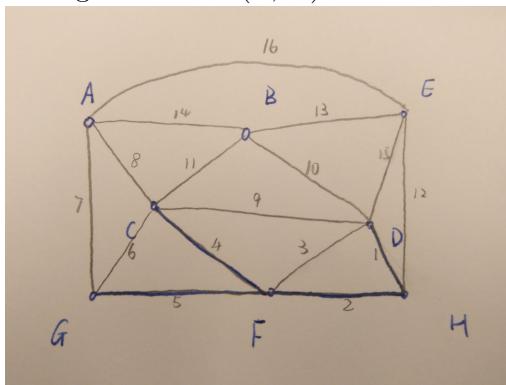
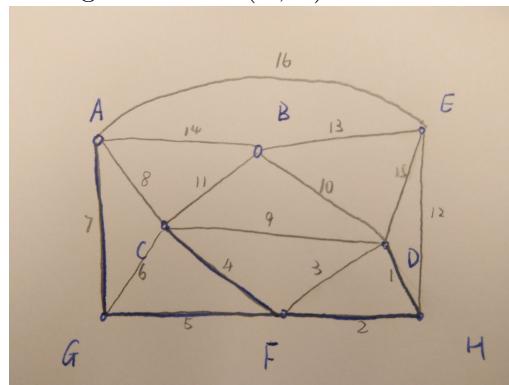
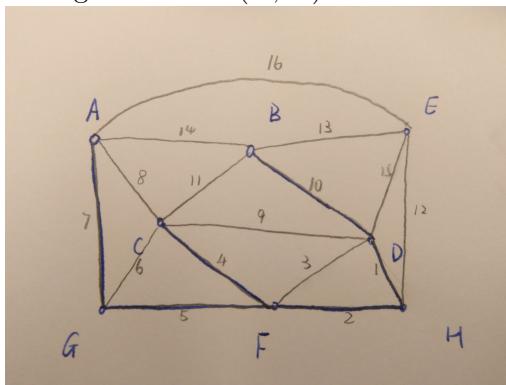
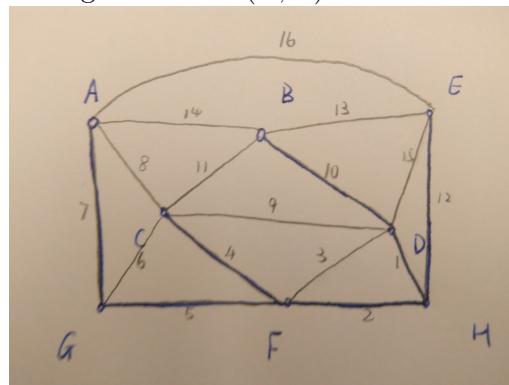


Figure 1: Initial Figure

Figure 2: Add (D, H) to the treeFigure 3: Add (F, H) to the treeFigure 4: Add (C, F) to the treeFigure 5: Add (G, H) to the treeFigure 6: Add (A, G) to the treeFigure 7: Add (B, D) to the treeFigure 8: Add (E, H) to the tree