Exercise Sheet: Kruskal and Prim's algorithm

Data Structures and Algorithms (X_400614)

1) Use Prim's algorithm for the following exercises.
    a) Show the minimum spanning tree for the graph in Figure 1. Also show the tree at each step of the algorithm.
    b) What is the total weight of the tree from 1a?

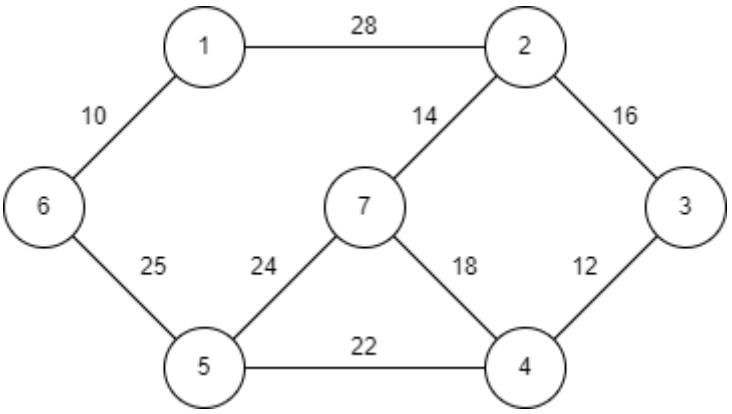

Figure 1. The graph to apply Prim's algorithm to.

2) Show the minimum spanning tree for the graph in Figure 1, but now with Kruskal's algorithm. Also show the tree at each step of the algorithm.

3) What is the complexity of Prim's / Kruskal's algorithm in terms of Big O?

4) What are the assumptions that must hold for Prim's algorithm and for Kruskal algorithm?

5) Which data structure can be used to speed up Prim's algorithm? Why? What is the running time when this data structure is used in terms of Big O?