CS 2233 : Data Structures : Practice Problems 2

IIT Hyderabad

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Questions

1. For the below figure, run Dijkstra's algorithm with the vertex marked 0 as the starting vertex. Show the step by step progress of the algorithm.

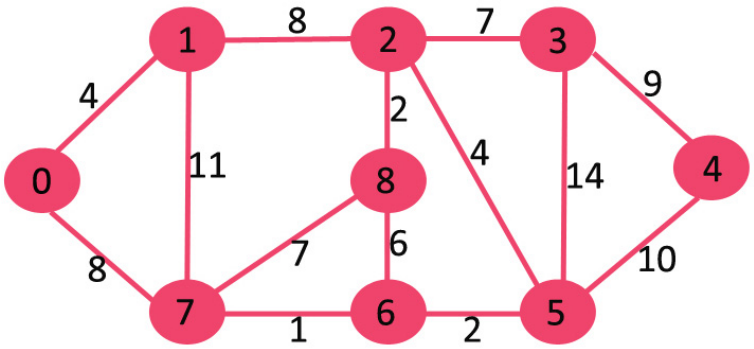

Figure 1: Dijkstra's Algorithm and Graph Representation.

2. Build a max heap, by entering the values $1, 2, 3, 4, 5, 6, 7, 8, 9, 10$ in that sequence. Show the heap after each insertion. Also show the max heap created where you start with the above values in the above sequence, and run the $O(n)$ BuildHeap procedure that was taught in class.

3. Given an undirected graph with edge weights from the set $\{1, 2, 3\}$, explain a "fast" algorithm in order to find shortest paths from a single source.

4. Provide the representation in adjacency matrix and adjacency list for the graph in Figure 1.

5. Explain the step-by-step execution of Kruskal's algorithm on the below graph in Figure 2.

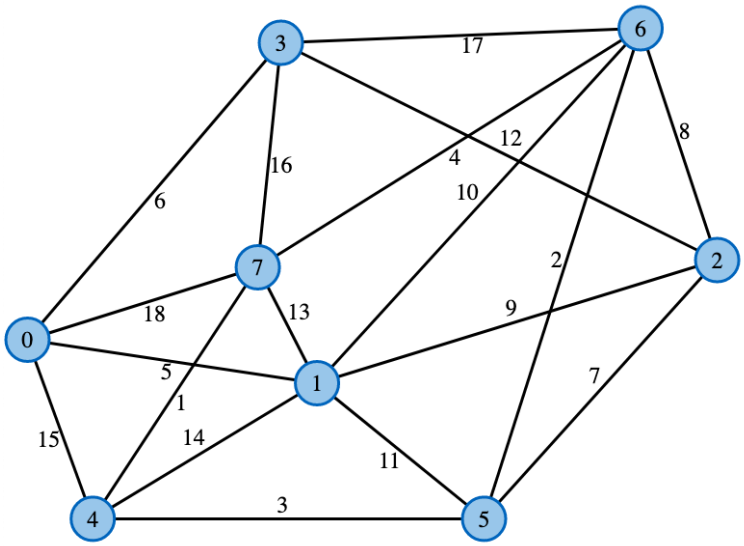

Figure 2: Kruskal's Algorithm