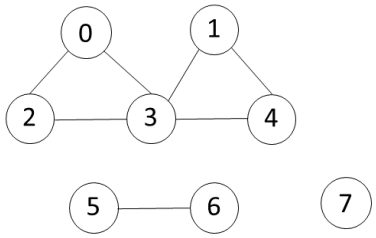
CS2302 Data Structures

Spring 2020

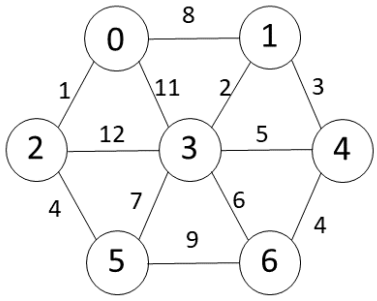
Exercises

Graphs and disjoint set forests

1. Trace the execution of the connected components algorithm using the following graph as input. Show the configuration of the disjoint set forest after every step.



2. Trace the execution of Kruskal's Minimum Spanning Tree algorithm using the following graph as input. Show the configuration of the disjoint set forest after every step.



3. A singleton is a set that contains only one element. Write the function *singleton(s,v)* that receives a disjoint set forest *s* and an integer *v* and determines if *v* is a singleton in *s*.

4. A disjoint set forest is compressed if every item is a root or points to a root. Write the function *is_compressed(s)* that receives a disjoint set forest *s* and determines if *s* is compressed.