

Homework 10: Graphs part 1**Problems**

1. (15 pts) Exercise 20.1-5.
2. (15 pts) Exercise 20.2-6.
3. (15 pts) Exercise 20.2-7.
4. (10 pts) Exercise 20.3-6.
5. (10 pts) Exercise 20.3-9.
6. (15 pts) Exercise 20.3-12.
7. (20 pts) Exercise 20.4-5.
8. (15 pts) Two special vertices s and t in the undirected graph $G=(V,E)$ have the following property: any path from s to t has at least $1 + |V|/2$ edges. Show that all paths from s to t must have a common vertex v (not equal to either s or t) and give an algorithm with running time $O(V+E)$ to find such a node v .
9. (Extra credit 25) Problem 20-3.
10. (Extra credit 25) Problem 20-4.
11. (25 pts) Exercise 21.1-3.
12. (25 pts) Exercise 21.2-2.
13. (25 pts) Exercise 21.2-4.
14. (25 pts) Exercise 21.2-5.
15. (Extra credit 40 pts) Problem 21-1.
16. (Extra credit 30 pts) Exercise 21.1-11.
17. (Extra credit 30 pts) Write the code for Kruskal algorithm in a language of your choice. You will first have to read on the disjoint sets datastructures and operations (Chapter 21 in the book) for an efficient implementation of Kruskal trees.