CS161: Design and Analysis of Algorithms **Spring 2001**

Assignment #5

Due: Thursday, May 31st, 2001. In class.

Problem 1. Do problem 17.2–4 in CLR. (page 337)

Problem 2. Let $G = (V, E)$ be a graph and $w : E \to \mathbb{R}$ be a weight function. Suppose that $w(e_i) \neq w(e_j)$ for all edges $e_i, e_j \in E$ with $e_i \neq e_j$. Prove that G has a unique minimum spanning tree.

Problem 3. Let $G = (V, E)$ be a graph and $w : E \to \mathbb{R}$ be a weight function.

a. Let $e = (u, v)$ be the edge of minimum weight in G. Prove that there exists a mininum spanning tree containing e.

b. Is it true that the edge of maximum weight in G is never contained in a minimum spanning tree? Either prove your claim or give a counter example.

Problem 4. Do problem 24.2–4 in CLR. (page 510)

Problem 5. Read Sections 22.1 to 22.3 and do problem 22.3–2 in CLR. (page 450)