

# CS 3500: Introduction to the Theory of Computation

## Problem Set 6

Due July 18, 2003.

### Problem 1 [20 Points]

Exercise 22.3-12 on page 552 of CLRS.

### Problem 2 [20 Points]

An undirected graph  $G = (V, E)$  is *2-colorable* if there is an assignment  $C : \{\text{Red, Blue}\} \rightarrow V$  of two colors, Red and Blue, to vertices of  $G$  such that no two adjacent vertices have the same color, i.e.  $\forall (u, v) \in E, C(u) \neq C(v)$ . Give an efficient algorithm that decides whether a given graph is 2-colorable. (**Hint:** You may find Breadth First Search helpful.)

### Problem 3 [20 Points]

Exercise 23.2-4 on page 574 of CLRS.

### Problem 4 [20 Points]

Exercise 23.2-7 on page 574 of CLRS.

### Problem 5 [20 Points]

Exercise 24.3-4 on page 600 of CLRS.

### Problem 6 [20 Points]

Exercise 24.3-6 on page 600 of CLRS.