CSE 565	Martin Fürer	Algorithm Design and Analysis

Assignment 6 Given: 10/4/18 Due: Wednesday 10/10/18

Exercises

Exercises are for your own practice. Don't hand them in.

1. Solve Exercise 1, Chapter 5 on page 246 of the Textbook.
   (Median of 2 sequences)
2. Solve Exercise 2, Chapter 5 on page 246 of the Textbook.
   (Significant inversions)
3. Solve Exercise 6, Chapter 5 on page 248 of the Textbook.
   (Local minimum in tree)

Problems

Problem solutions have to be handed in. A subset of them will be graded.

1. [5+10=15 points] (Multiplication)
   (a) Show how to compute a product of two complex numbers by 3 multiplications of real numbers and a constant number of additions.
   (b) The integers in the number field $\mathbb{Q}(\sqrt{2})$ are the numbers of the form $a + b\sqrt{2}$ where a and b are rational integers (i.e., usual integers). Show how to compute the product of two integers in $\mathbb{Q}(\sqrt{2})$ doing 3 integer multiplications and some other operations that can be done in linear time. We assume rational integers are represented in binary.
2. [20 points] Solve Problem 5, Chapter 5 on page 248 of the Textbook.
   (Visible lines)
3. [25 points] Solve Problem 7, Chapter 5 on page 248 of the Textbook.
   (Local minimum in grid)