

## Introduction to Computer Science E09 – Week 5

### **Lecture: Monday, September 21**

Lene Monrad Favrholt gave a lecture on algorithms based on Chapter 5.

### **Lecture: Wednesday, September 23**

Lene Monrad Favrholt continued to lecture on algorithms based on Chapter 5 and gave a brief introduction to Maple.

### **Lecture: Monday, September 28, 12-14 (U20)**

Rolf Fagerberg will lecture on files, merging, and hashing, based on Section 9.5.

### **Lecture: Wednesday, September 30, 14-16 (U28)**

Rolf Fagerberg will lecture more on files, merging, and hashing, based on Section 9.5.

### **Lecture: Monday, October 5, 12-14**

Lene Monrad Favrholt will give a brief introduction to cryptography and lecture on online algorithms.

## Discussion section: September 29, 12:15-14 (U133)

Discuss the following in groups of three or four (the page numbers and problem numbers are from the textbook):

1. Pages 239–240: Problems 1, 3.
2. Pages 250–251: Problems 5, 7.
3. Page 260: Problems 2, 3, 4.
4. Page 270: Problems 3, 5.
5. Pages 271–276: Problem 50.
6. Consider the following problem (mentioned in lecture): There are three politicians,  $A$ ,  $B$ , and  $C$ . You know that one of them always tells the truth, one of them always lies, and one of them sometimes tells the truth and sometimes lies. You are allowed to ask these three politicians any three true/false questions you like, and you may choose which politician is asked which question. How would you determine how to order the politicians by how often they tell the truth? This problem is quite difficult. Try your problem solving abilities, but do not be disappointed if you fail.
7. Page 277 questions 1, 2, 3, 5, 6.

## Lab: October 2, 10:15-12 (U26)

The goal of this lab is to deepen your knowledge of Maple and L<sup>A</sup>T<sub>E</sub>X. Start with Maple:

1. Make sure you have solved the first three parts of the Maple exercises on Weekly Notes 4.
2. Compare your solutions to Part 3 of the Maple exercises. Do you have any open questions? Have you found any particularly clever solutions?
3. Solve Part 4 of the Maple exercises, i.e., implement merge sort in Maple.

4. Read up on the the main functions you have used in the Maple help files.

Next, improve your L<sup>A</sup>T<sub>E</sub>X skills. Examples for T<sub>E</sub>Xfiles can be found at <http://imada.sdu.dk/~uthor07/DM526E2009/latex/>.

1. Make sure you understand the complete content of the L<sup>A</sup>T<sub>E</sub>X introduction found at <http://imada.sdu.dk/~petersk/DM526/latexintro.pdf>. Try to make a simple L<sup>A</sup>T<sub>E</sub>X document with some mathematical formulas and some tables.
2. Label different parts of your program and make references to these parts. More specifically, insert a figure with a caption and refer to it in your text. Where does L<sup>A</sup>T<sub>E</sub>X place your figure?
3. Include source code placed in a file outside your L<sup>A</sup>T<sub>E</sub>X document, e.g., by using the `listings` package.
4. Write down an algorithm in pseudo-code in L<sup>A</sup>T<sub>E</sub>X using the `algorithm` and `algorithmic` packages. You can obtain the packages from <http://www.ctan.org/tex-archive/macros/latex/contrib/algorithms/>.
5. Find documentation for the L<sup>A</sup>T<sub>E</sub>X packages that you know.

## Assignment due 14:15, October 8

Late assignments will not be accepted. Working together is not allowed. You may write this either in English or Danish. Write clearly if you do it by hand. Even better, use L<sup>A</sup>T<sub>E</sub>X.

1. Page 271: Problem 7.
2. Page 273: Problem 21.
3. Page 273: Problems 25, 26.
4. Page 273: Problem 31.