Institut for Matematik og Datalogi
Syddansk Universitet

September 21, 2011
JFB

Introduction to Computer Science E11 – Lecture 7

Lecture, September 20, 8:15–10, U26

We covered up through section 4.4 of chapter 4 (section 4.5 will be covered later in the course).

Lecture, September 22, 12:15–14, U26

We will cover most of chapter 5 in the textbook.

Lecture, September 27, 8:15–10, U26

Kim Skak Larsen will lecture on chapter 9 in the textbook.

Discussion section (and study group before that): September 30

For the problems below Group 1 should prepare to present Problem 1 on page 217, Problem 5 on page 227, Problem 2 on page 236, Problem 3 on page 244. Group 2 should prepare to present Problem 2 on page 217, Problem 6 on page 227, Problem 2 onpage 236, Problem 50 on page 250. Group 3 should prepare to present Problem 3 on page 217, Problem 7 on page 227, Problem 4 on page 236, Problem 53 on page 250.

1. Page 217: Problems 1, 2, 3.
2. Page 227: Problem 5, 6, 7.
3. Page 236: Problem 2, 3, 4.
4. Pages 244: Problem 3.

5. Pages 250: Problems 50, 53 (what precondition and loop invariant should hold)?

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. (You may assume that the politicians will actually give "true" or "false" as an answer.) 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 251 questions 1, 2, 3, 4, 6.

Assignment due 8:15, October 4

Late assignments will not be accepted. Working together is not allowed. (You may write this either in English or Danish.) Explain your answers.

Write your solution to this assignment in LaTeX. Submit a PDF file through the Blackboard system and turn in an identical paper copy. Write your full name and your section number clearly on the first page of your assignment.

1. Consider the problem of crossing a river that contains stepping stones. Assume that the stepping stones are placed such that one person could cross the river alone using these stepping stones, but the stones are such that only one foot can be on any stone at any time. A deadlock can occur if two people try to cross the river in opposite directions and meet in the middle. Explain how the three conditions for deadlock are met.

   Describe an algorithm for this which avoids deadlock, but allows more than one person to be going in the same direction at the same time, following each other. Which of the three conditions does your algorithm avoid?

2. On pages 196–7, do problem 28.

3. On page 148, do problems 32a and 32c - specify which operating system. You may search on the Web for answers for both parts of this last question, though this is not generally allowed (and is not allowed for the other questions).