Institut for Matematik og Datalogi
Syddansk Universitet

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JFB

Introduction to Information Technology
E01 – Lecture 3

Lecture, September 21

We started with section 1.4 in the textbook. Then, algorithms from chapters 2 and 3 in the textbook (sections 2.1 through 2.3.1 and the algorithm from 3.5.3) were presented, and spreadsheets from section 11.2 were introduced. (Section 11.2.4 was skipped since it assumes too much knowledge from earlier in the textbook.) Connections between the theoretical pseudocode for representing algorithms and the concrete program Excel were discussed.

Lecture, October 1, 16:15–18:00 in U45

We will continue talking about algorithms from chapters 2 (from section 2.3.2 to the end of the chapter) and 3 (the first three sections) in the textbook. We will also talk about Maple, a program for symbolic computation, and demonstrate how to use it. Read section 11.4 in the text, but keep in mind that the syntax you will you use with Maple is different from the syntax in Mathematica, which is used for the examples in the textbook.

Weeks 43 and 44

The description of the primary lab for week 43 and the topics for the lecture in week 44 will be on the next weekly note, which will be given to you in your lab in week 41. Read chapter 1 in *Calculus the Maple Way* before the lab in week 43.

Announcement 1

You can buy a CD containing Maple from the bookstore, so that you can install it on your own computer. It only costs 25 kr. Maple 7 is installed on the computers you will use in the laboratories, so there is no requirement that you buy the program. It is, however, a very useful program, and this is a very good price arranged through the university.

Announcement 2

Please check that the following items are set up correctly in your computer accounts. If they are not, please inform your lab instructor so that they can be fixed in time. First, within **Outlook Express**, which you will use in this lab, check that you have a button **Launch PG..** and a padlock (hængelås) somewhere in the lower right hand corner of your screen. Second, check that you have the folder **Salsa**. Third, make sure that you have received either e-mail from Joan Boyar or from the DM07 mailing list.

Primary Lab 3 - for week 41

The purpose of this lab is to learn how to use Excel to perform some common statistical calculations.

We have had some help from the Department of Statistics and Demography for this lab. They have prepared some Web pages which you can find by following the link from our course home page. You can follow directions there while working in Excel, switching between Internet Explorer and Excel, by alternately iconifying them.

Start up Excel (click on your **Start** button, then on **Programmer**, and then on **Microsoft Excel**). Start up Internet Explorer and click on the link **statistics lab**. This will get you to a page with three links, which define three different parts of this lab. You should follow all three links, one at a time, and follow the directions you find there.

The spreadsheets you e-mail to your lab instructor should contain the results of following either the first two links (easier) or the last two (harder). Try all three parts if you have time.

Save your spreadsheets (you will probably create more than one), either in your folder “Excel files”, or in a new folder for statistics, since you will later be doing a Maple lab on statistics. When doing the Maple lab, you will need to use one of the spreadsheets you create at this lab, so save them such that you can easily find them again. Remember to e-mail your spreadsheet to your instructor and logoff your computer.

Each of the three parts of this lab, starts with a short explanation of the theory behind what you will be doing. If you get a chance to read this before coming to your lab section, please do. Statistics are too often used incorrectly! You will probably take a statistics course later to learn more about the theory.

In each part, the description of your lab is entitled “Praksis i Excel”. Below, find additional comments about each of the three parts:

Beskrivende statistik: Choose whatever 20 numbers you want. They could for example, be integers between 0 and 100.

Linear regression: Try clicking on the **example** link and moving the line in the example. It's cute. :-)

Do not type in your own data. First use the data from your last lab, in your spreadsheet, under the headings **1/s** and **1/v**. (When you copy, you want only the data, not the formulas.) As a second set of data, use the data in the e-mail from me with the subject "regression data".

The "figurknap" mentioned is the one called "Chart Wizard" which you used in Lab 2 for making plots.

Remember to use some labels for your plots. For the data from my e-mail, the y-values were created by computing $x(\ln x)^2$ and then rounding, in case you want to write that.

When you are inserting the regression line in the plot, rather than clicking on **OK** immediately, notice that it is possible to try fitting other types of curves through the points. We will just try linear now, but try clicking on **Instillinger**. Under **Prognose**, you can get it to extend the line some distance in either direction. Try changing the value in **Fremad** to 10. Then click on the bottom two boxes so that you get the formula for the line and R^2 . Now click on **OK**.

χ^2-test: Before doing this, close Excel. For the χ^2-test part of the lab, you can get data from the link on the home page for DM07 or by directly using the URL:

www.imada.sdu.dk/~joan/IT/chi-square.xls

Find this using Internet Explorer, and Excel will open up within Internet Explorer. Save this file, and open it up again in Excel. **Ark2** contains the original data in columns A and B. You can see that this was copied to columns J and K and sorted. (To try sorting yourself, you can select the columns you want sorted (A and B, for example) and click on the symbol $\boxed{\begin{matrix}\text{A} \\ \text{Å}\end{matrix} \downarrow}$). The other two columns were made by copying and pasting. From columns D and E, you can quickly figure out the numbers of men with different hair colors, and from G and H, the numbers of women with different hair colors.

These results are in **Ark1**. In columns A through F, the data needed for a χ^2-test on all the data has already been calculated. You can click on different cells to see what formulas were used. There are two smaller tables with only some of the data filled in. Complete those two tables yourself.