

It is best to work in groups so that you can discuss the exercises and any problems that come up, but each of you should have your own individual workstation so that you can do out the exercises yourself.

Class plan: For each part listed below, brief examples will be covered together through the class notes. Afterwards, you can try to do out the examples yourself at your workstation. There are also several further suggested exercises that will help you understand how SAS works. I will go around to answer questions.

Familiarization with SAS .

To start familiarizing yourself with SAS , we'll go over the different SAS Windows. Note that the control bar changes depending on the window you choose.

Exercises

1. Create a directory on your workstation and the `multi` data library which will be directed to the latter.
2. Copy the `elnino.sas7bdat` file into the `multi` directory. Make sure you can access it through SAS .
3. Import the `aapl.csv` file into the `multi` library.
4. Open the AAPL file in the Explorer window to see if everything is correct. Note that you can't change values (as in Excel for example). It is important to close the file before running a program with it, otherwise there will be an error.

DATA and PROC statements

The vast majority of operations in SAS are done with orders. There are two main kinds:

- DATA statements allow datasets to be manipulated.
- PROC statements are used to call a SAS analysis module.

Exercises

5. The `aapl.csv` file used in Exercise 3 gives the value of Apple's share month by month from 1984 to 2010 (opening price, closing, minimum and maximum monthly, etc.) First, order the dataset in ascending order of dates. Then create a new dataset where you'll set variables for:
 - (a) The difference between the minimum value and the maximum in each month.
 - (b) The percentage increase between the value at the opening and the value at the close of the stock for each month.
 - (c) A variable equal to 1 if the value of the stock has increased during the month and equal to 0 if not.
 - (d) [★] The percentage increase between the adjusted value (`adjusted_close`) from month to month.
6. Using the MEANS procedure, give an overview of the characteristics of the variables calculated in 5, from (a) to (d) (average, standard deviation, min, max, etc.)

ODS

The ODS module allows you to present SAS results in a more elegant way. Among other things, it allows you to create RTF files whose elements can be taken up in a written relationship with Word. ODS also allows you to extract part of the SAS output and save it to a dataset.

Exercises

7. Redo question 6 above, but this time produce the result in the form of an RTF document through ODS.
8. [★] Save the averages calculated in question 6 in an SAS data file.

Graphics in SAS**Exercises**

9. Produce a histogram of the percentage increase between the value at the opening and the value at the close of the stock for each month (calculated in 5.b)

Consult the SAS help

Let's explore the SAS help ... We will be looking for information on PROC MIXED that is used for fitting mixed linear models. Like many statistical functions, PROC MIXED is part of SAS /STAT module. The SAS documentation is very complete: don't be intimidated by the volume of information!