Introducing SAS

What is SAS?

• SAS stands for **Statistical Analysis System**

• Powerful and flexible tool for many purposes: data management, estimation, optimization, visualization...

• Mixture of 'easy-to-use' procedures and manual programming

• Macro language for recurring code sequences
Introducing SAS

The SAS User Interface

1. Log window:
   - **Blue** is ok (in general)
   - **Green** is a warning (should be checked)
   - **Red** is an error message (**do not ignore!**)

2. Output window: Results are printed in this screen

3. Editor window: Write your program commands in here.
A few general concepts of SAS

- Data steps: create data sets, create new variables, subset existing datasets,...

- Procs: analyze your data, estimation, visualization,...

- Proc SQL: gives access to SQL commands, merging different data sets,...

- Proc IML: Interactive Matrix Language, access to matrix operations (similar to MATLAB or GAUSS),...
Introducing SAS

• Macros: often recurring pieces of code can be written as macros, very efficient programming!!!
Introducing SAS

Basic handling of data

To use a SAS-dataset saved on your harddisk or to create a permanent dataset, assign a library pointing to the respective folder:

```
libname name "drive:\ folder";
```

Now, you can find all datasets already in folder or newly created datasets in the respective library name in your SAS-Explorer.
Introducing SAS

Working with temporary files vs. permanent files

The name of a SAS dataset consists of two parts:

\[ \text{library} \cdot \text{dataset} \]

**Permanent dataset**: choose \textit{name} as your library, if you want to write the dataset permanently into \textit{folder}

**Temporary dataset**: skip the library or choose \textit{work} as your library to create temporary datasets.

Temporary datasets will be lost when you terminate SAS.
Getting data into your SAS system

Reading Ascii data into SAS via Data Steps and a first introduction into Proc SQL

Example: SAS_session1.sas
Creating a table with SQL code

Proc SQL;
create table name as select variables
from dataset;
quit;
Merging two tables with SQL code

Proc SQL;
create table name as select a.variables , b.variables from dataset1 a dataset2 b on a.idvar1=b.idvar2;
quit;
Some procedures (Procs) for descriptive statistics

- Proc MEANS: calculates mean, median, standard error, confidence limits for the mean,...

- Proc CORR: calculates several correlation coefficients

- Proc FREQ: one-way frequency table, n-way contingency tables, several test statistics

- Proc UNIVARIATE: several descriptives, histograms, kernel densities,...
Introducing SAS

Example for Proc MEANS

Proc MEANS data=dataset;
var variables;
output out= outdataset mean=meanvar ...;
run;

Example: SAS_session2.sas