

Chapter 1: Introduction to SAS

- *SAS programs*: A sequence of statements in a particular order.

Rules for SAS statements:

1. Every SAS statement ends in a semicolon!!!;
2. Upper/lower case does not matter in SAS.
3. Statements can continue on next line.
4. Statements can be on same line as other statements.
5. Statements can start in any column.

Comments: Two possible styles: * . . . ; or /* . . . */

```
* Here is a comment;
```

```
/* Here's another comment */
```

SAS Data Sets

- Variables represented by *Columns*
- Observations represented by *Rows*
- Two Data Types: *Numeric* and *Character*
- Choose data type based on how you *use* the variable
- **Example:** ZIP code could be character
- Missing data in SAS denoted by a period (.) for numeric data and blank space for character data

Rules for Naming SAS variables (SAS 9)

- Names can be 32 characters or fewer
- Names must begin with a letter or underscore (_)
- Names may contain *only* letters, numbers, and underscores
- Can contain upper/lower case

Two Parts to SAS Programs

DATA step:

- Begins with DATA statements
- Reads in and modifies data
- Creates SAS data set

PROC step:

- Begins with PROC statements
- Performs (statistical) analyses on data
- Produces results/output

- Steps may contain many statements.
- Steps usually end when:
 1. another step begins
 2. a `RUN;` statement appears.

```
DATA height;  
...lots of SAS statements ...  
run;  
  
PROC PRINT DATA = height;  
RUN;  
  
PROC REG;  
...lots of SAS statements ...  
run;
```

- SAS executes steps line by line.
- Be sure to do things in correct order.
- SAS reads data sets *one observation at a time*.

PCs in lab and classroom use **windowing** environment.
See Sec. 1.5 for information on other SAS environments.

SAS windows

- 3 main windows and 2 secondary. *Primary:*
- “**Editor**”: Type in and edit SAS programs in the editor window
(Color coded in new versions of SAS)
- “**Log**”: Contains notes about submitted SAS programs, and info about any errors/warnings
- “**Output**”: Printable results (if any) are printed here *Secondary:*
- “**Results**”: Table of contents for Output window
- “**Explorer**”: Icons for file folders and SAS libraries

SAS Studio environment is very similar, but slightly different window names:

- 3 main windows and 2 secondary. *Primary:*
- “**Code**”: Type in and edit SAS programs in the Code window
(Color coded in new versions of SAS)
- “**Log**”: Contains notes about submitted SAS programs, and info about any errors/warnings
- “**Results**”: Printable results (if any) are printed here *Secondary:*
- Window on left side with information about libraries, files, folders, etc.

- Once program is entered into “Editor”, choose “Submit” under “Run” menu (or click “running man” icon) to submit it.
- Go to Output (or Results) and Log windows for results or notes.
- There are the usual editing tools to cut, copy, paste selections of code, or to clear all code.
- Log window → error messages, number of observations and variables created.

Printing/Saving Output:

- Directly from Output window (wastes paper)
- Using Results window (can print/save partial output)
- Copy to file (Word or Notepad); print that.

In SAS Studio:

- Can print output directly from Results window (might be wasteful)
- Can download results from Results window as .html, .pdf, or .rtf file
- Can edit .rtf file in Word before printing (can produce more concise output)

SAS Libraries

- Location where SAS data sets and SAS files are stored.
- “Libraries” icon in “Explorer” window:
Opens “Active Libraries” window
- In SAS Studio, click on “Libraries” tab on left window.
- `Sashelp`, `Sasuser`, `Work`
- `Work` is the default library SAS will use if another is not specified.
- **Creating Libraries:** In Active Libraries windows, “File → New”
or “Right Click → New”
- **Name:**
libref (8 characters or fewer)
Path (location for data sets to be stored)
Enable (so you don’t have to redefine library each time SAS starts)

Viewing Data Sets in Explorer

- Double-click on a Library, then double-click on available data set (e.g., “Class” in `Sashelp`)
- Right-click on data set, select “Properties” to view its properties.
- Right-click → “View Columns” gives info on the variables in data set
- Can be done similarly in SAS Studio.

SAS System Options

Easiest way to set: Use `OPTIONS` statement at beginning of SAS program.

```
OPTIONS LINESIZE=80 NOCENTER NODATE PAGESIZE=64 NONUMBER;
```

Others given on page 27.