SAS Components

- This class
  - Base SAS – basic procedures and data management
- SAS has over 200 components, including
  - SAS/STAT – statistical analysis
  - SAS/GRAPH – high quality graphics & presentations
  - SAS/ACCESS – reads data directly from databases
  - SAS/ETS – econometrics and time series
  - SAS/INSIGHT – data mining
  - SAS/QC – quality control
  - SAS/PH – clinical trials

Applications

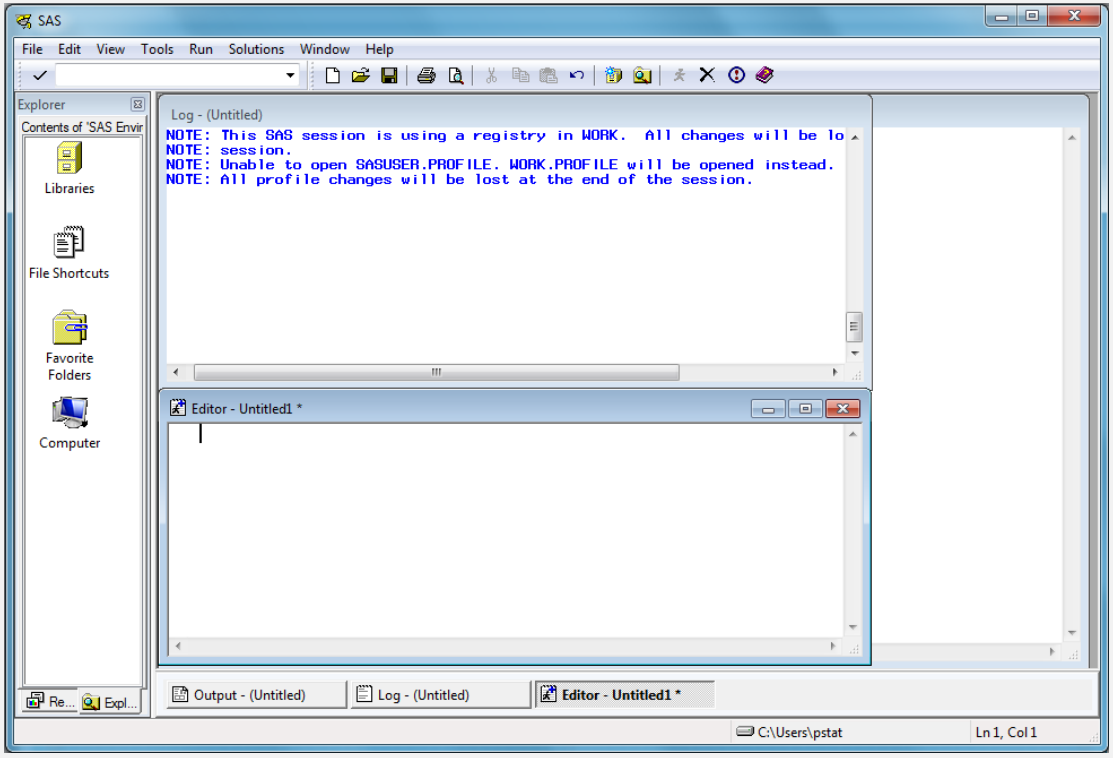
- Why are we using it?
- What are some of the applications?
  - Statistical analysis
  - Data management
  - Creating reports

Today's Objectives

- Open the program
- Learn how to navigate the program
- Learn some basic syntax
- Create our first SAS program!

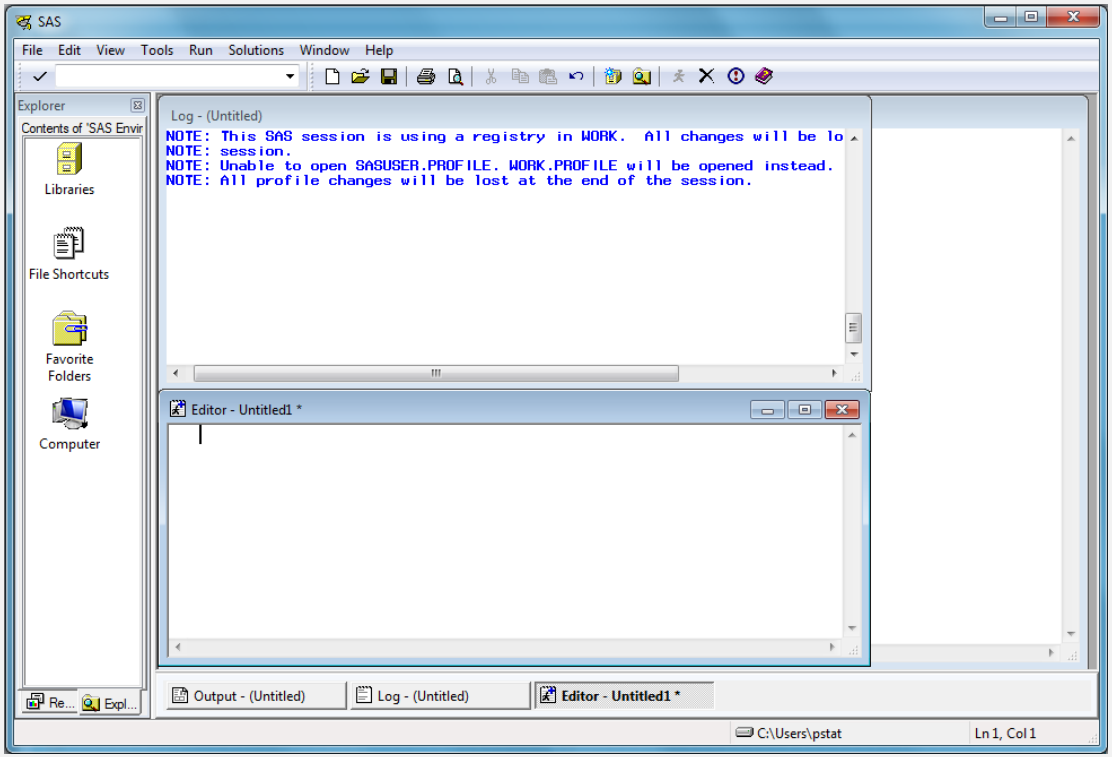
First Step

- Open SAS
  - Menu -> All Programs -> Math & Stats -> SAS -> SAS 9.4



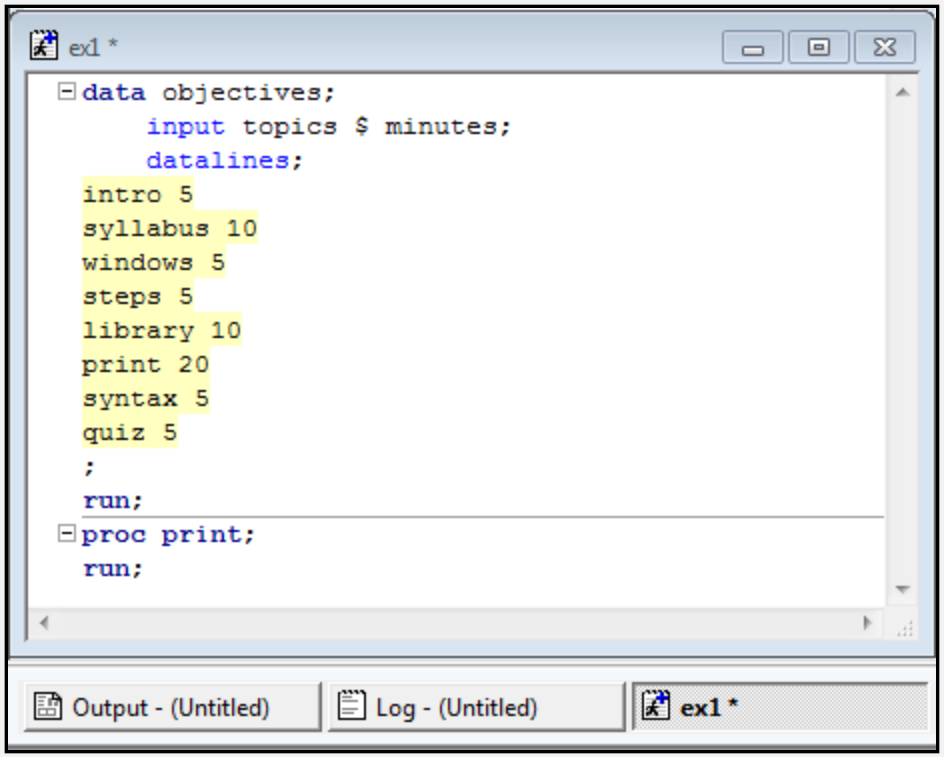
The Main Windows

- Five Main Windows
  - Editor
  - Log
  - Output
  - Results
  - Explorer



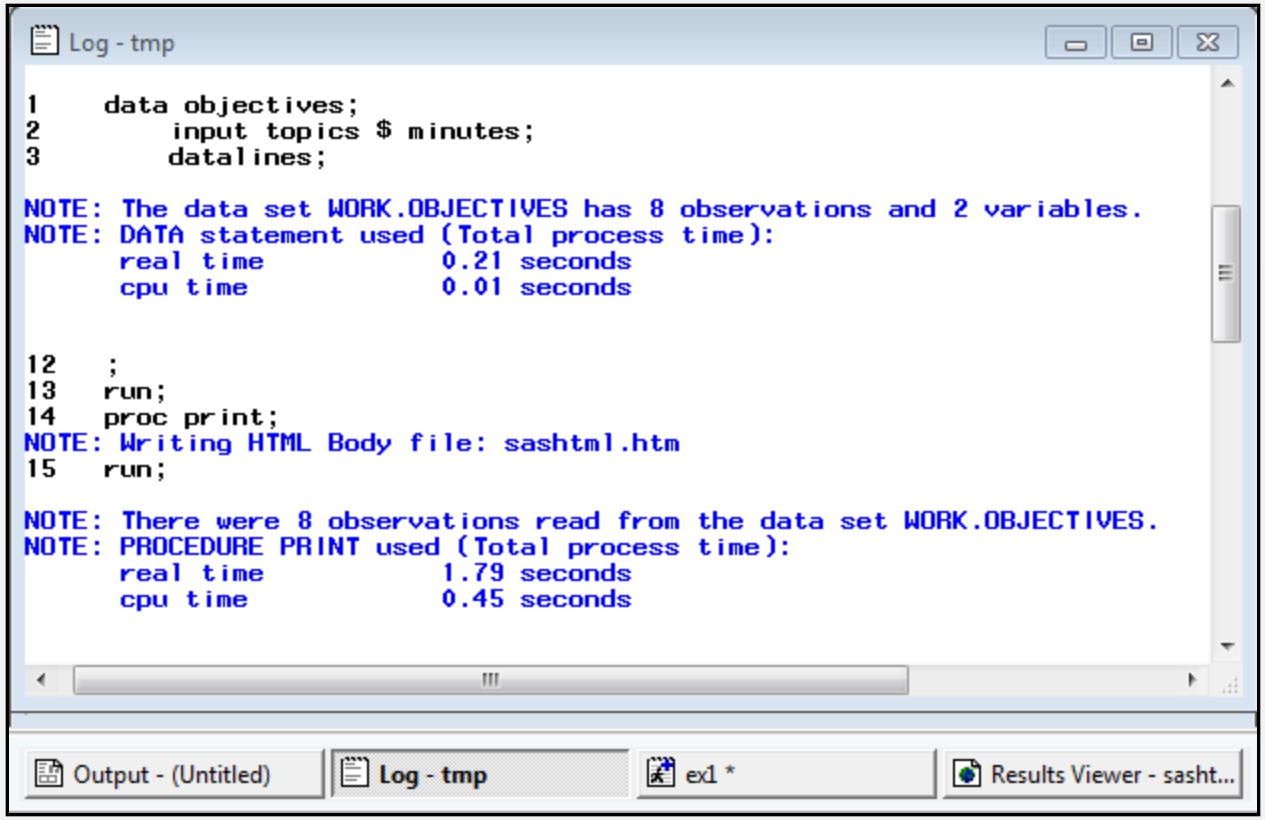
Editor

- Edit, execute, and save SAS programs



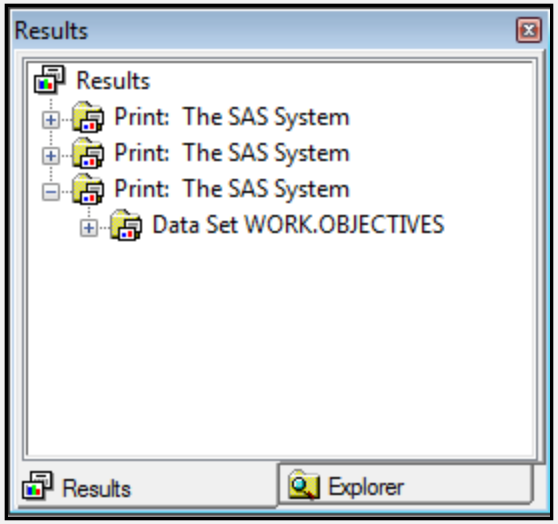
Log

- Displays status messages regarding the execution of SAS procedures



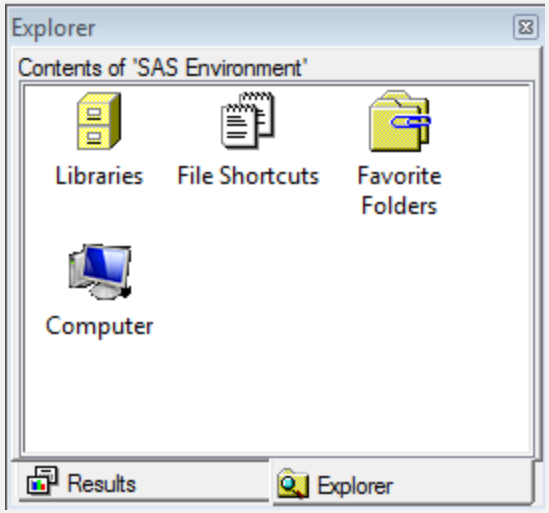
Results

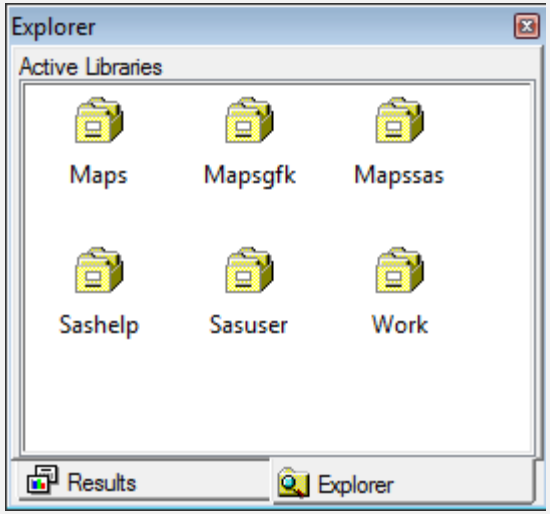
- Displays links to previously executed results

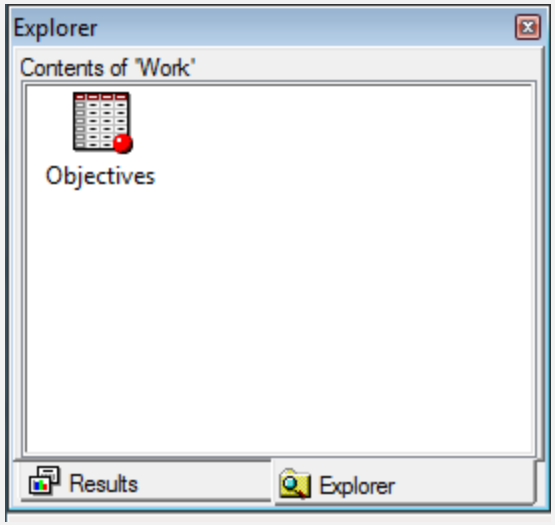


Explorer

- Navigate libraries, data sets, and other SAS objects







Output + Results Viewer

- Output window:

```
                The SAS System          13:49 Wednesday, March 18, 2015   1

     Obs     topics       minutes

       1     intro              5
       2     syllabus          10
       3     windows            5
       4     steps              5
       5     library           10
       6     print             20
       7     syntax             5
       8     quiz               5
```

- Results viewer
  - Default output for SAS 9.4
  - A single, continuous html report
  - Not affected by options like
    - Page size, page number, etc.

The SAS System

Obs	topics	minutes
1	intro	5
2	syllabus	10
3	windows	5
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5	library	10
6	print	20
7	syntax	5
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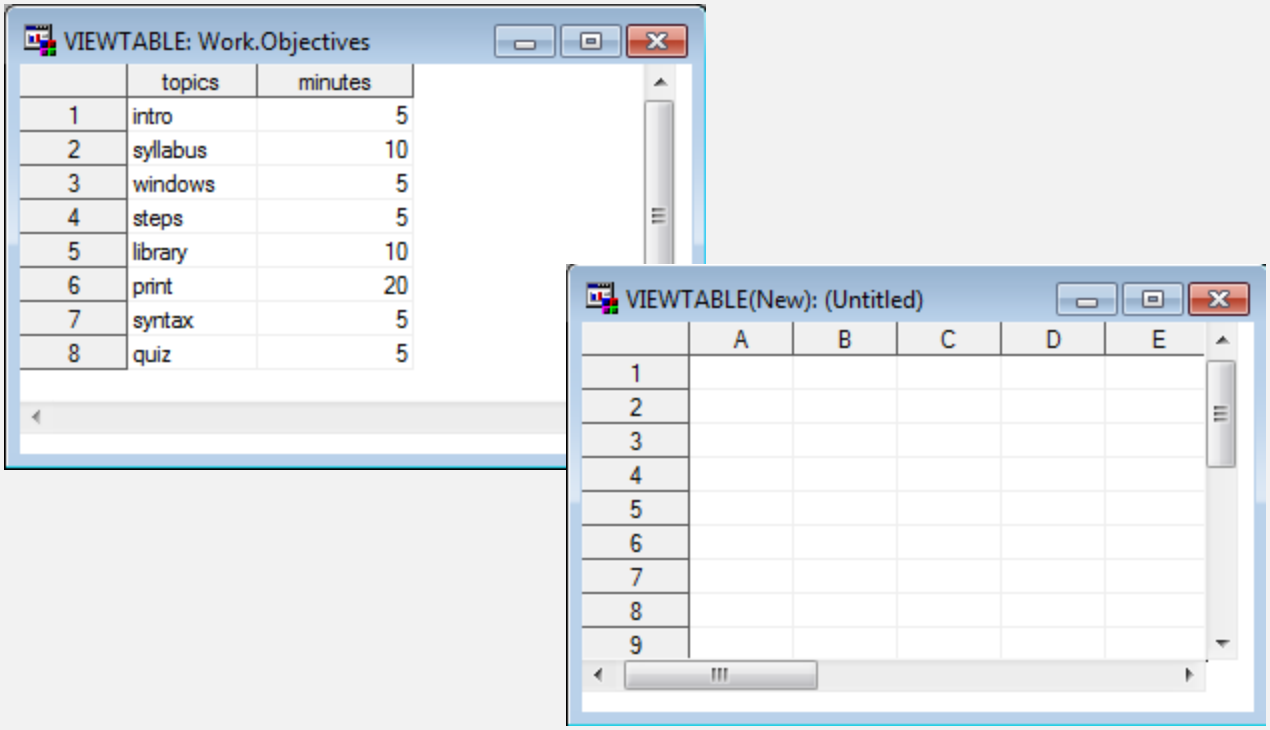
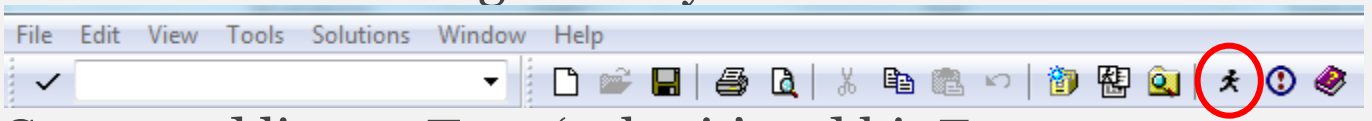
Another Useful Window: Table Editor



Getting Started

- How to submit/execute a program?
  - Make sure the Editor window is active
    - Submitting the entire program
      - Run → Submit
      - Click on the "running man" symbol in the toolbar



      - Command line → Type 'submit' and hit Enter
      - F8
    - Submitting a portion of the program
      - Highlight the portion you'd like to submit
        - <right click> → Submit Selection
        - F8

Getting Started

- How to save a program?
  - File → Save
  - Ctrl + S

File Extensions

- What are the file extensions for
  - A SAS program?
    - .sas
  - A SAS data set?
    - .sas7bdat
  - A SAS log file?
    - .log
  - A SAS output file?
    - .html (by default)

The Basics: SAS Process

The Basics

- SAS statements
  - Always begin with a keyword
  - Always end with a semicolon (;)
  - Are free format
    - i.e. Can begin at any location and end at any location
      - Entire program can be written on one line, or many lines
    - EXCEPT when using the datalines; statement
- SAS
  - Is not case sensitive
    - i.e. daTa nOtCaseSensitive;
    - EXCEPT in the case of string comparisons

The Basics

- Names of SAS data sets and variables must
  - Be no longer than 32 characters
  - Begin with a letter or underscore
  - Contain only letters, numbers, or underscores (_)

The Basics

- Comments
  - What are they?
  - Why should we use them?
  - Single line: begin with an asterick (*) and ends with a semicolon (;)
  - Multiple line: begins with a /* and ends with a */

The Basics

- SAS 9.4 has context-sensitive help.
  - Highlight a keyword and press F1

Libraries

- SAS file names are always contain 2 levels
  - Level 1: <library-name>
  - Level 2: <data-set-name>
    - i.e. <library-name>.<data-set-name>

- What does this mean?
  - SAS references folders called libraries when accessing SAS data sets
  - Libraries are simply pointers to folder locations on the disk drive
    - i.e. 'X:\PStat 130\data1'

Libraries

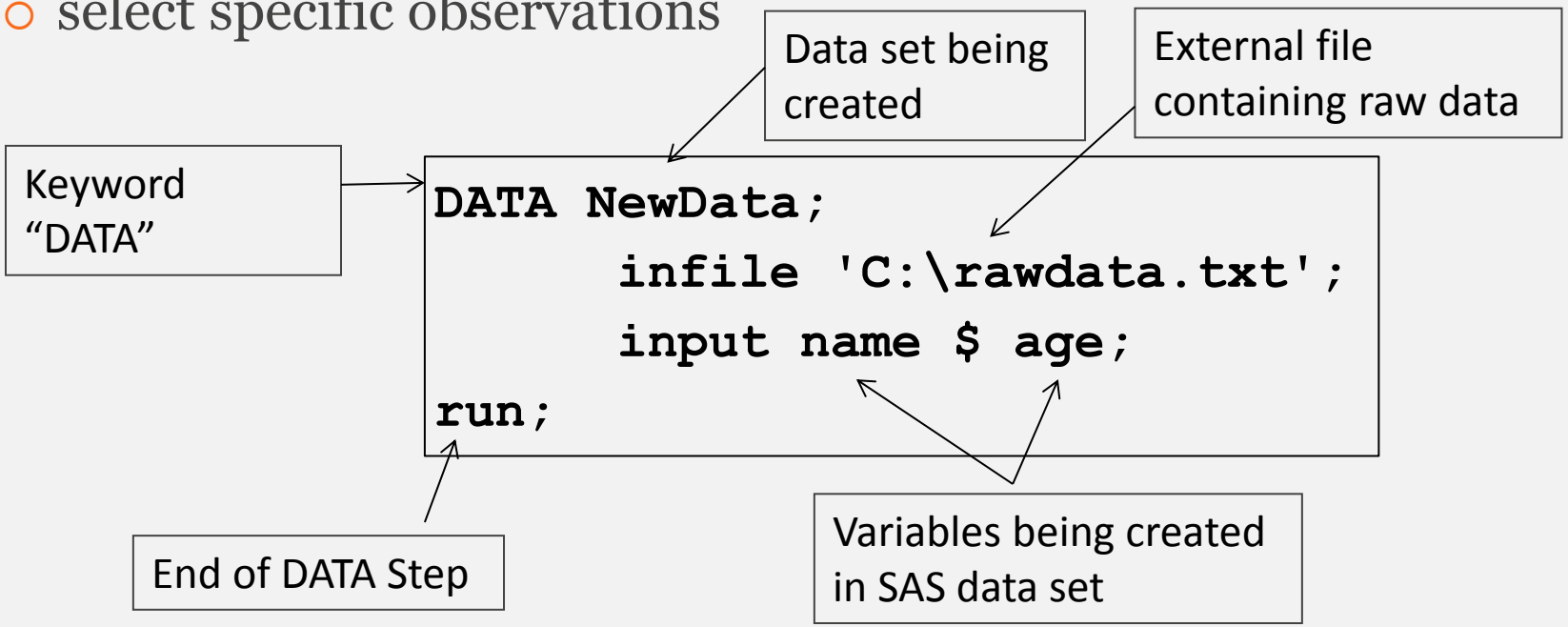
- SAS has 2 existing libraries:
  - work
  - sasuser
- work
  - Is a temporary library
  - Is the default library
- sasuser
  - Is a permanent library
- All other libraries must be assigned

Libraries

- Library references (libref) must
  - Start with a letter or an underscore
  - Be 8 characters or less
- To define a library, you need
  - The **libname** keyword
  - A user-defined libref name
  - A folder location
- General format:
  - `libname desktop 'C:\desktop';`

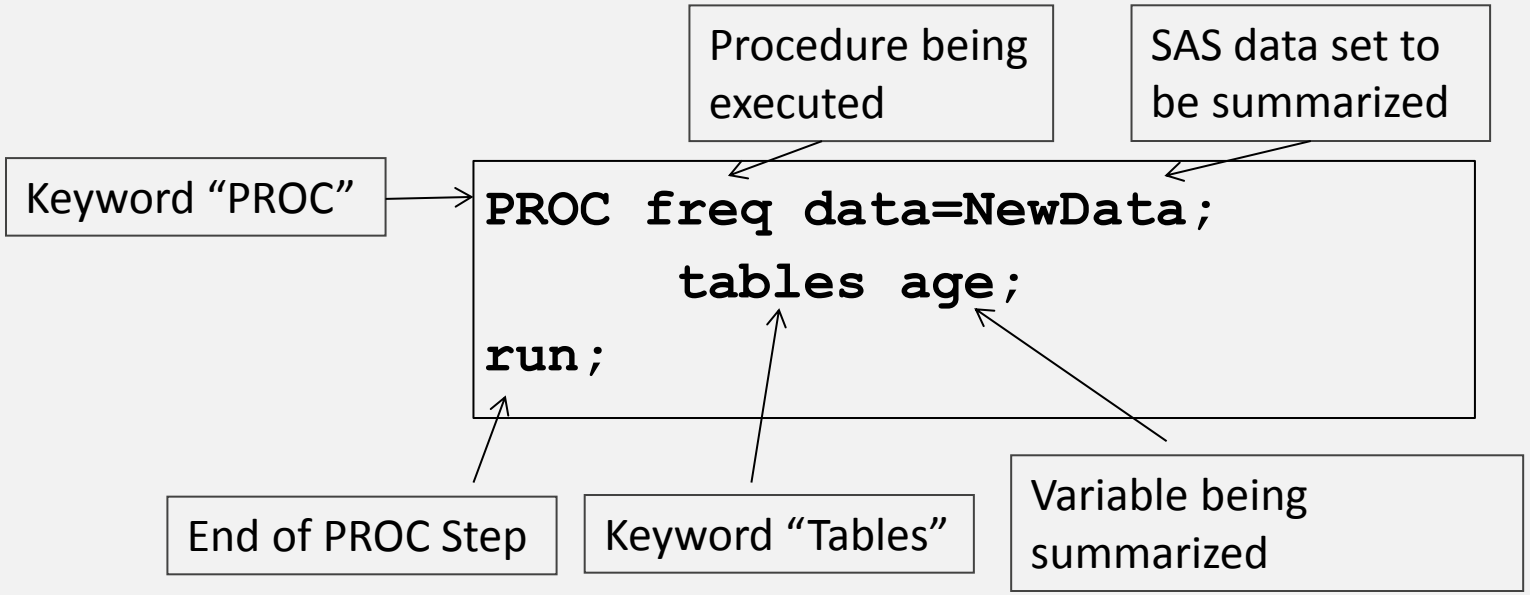
The DATA Step

- DATA Step: A set of statements that
  - read in a data file
  - assign variable names, labels, and formats
  - select specific observations



The PROC Step

- PROC Step: A set of statements that
  - perform “utility” operations on a data set
  - analyze data
  - output results or reports



First SAS Program

```
DATA intelligence;
   input IQ;
datalines;
99
140
125
118
104
;
run;

PROC print;
run;
```

i.e. work.intelligence

Obs	IQ
1	99
2	140
3	125
4	118
5	104

The SAS System 23:08 Tu

Obs	IQ
1	99
2	140
3	125
4	118
5	104