

# Intro to SAS

Clay Ford

UVa StatLab

# About the workshop

## Assumptions

- No prior knowledge of SAS
- Access to SAS

## Teach you how to...

- Load data into SAS
- Do basic data manipulation, graphing and statistical analyses
- Navigate SAS documentation

# About SAS

- SAS is actually the name of the company. They sell many products.
- This workshop introduces the product SAS 9.4, but should be fine for earlier versions, such as 9.3 or 9.2
- Available for Windows and Linux
- At UVa, obtain from ITS or access through the Hive
- If not at UVa or institution that provides SAS, try SAS University Edition (free but with restrictions)
- Programming Certifications available from SAS

# How SAS 9.4 works

- SAS 9.4 is not interactive and has no graphical user interface (GUI); you must write a SAS program to do something
- Typical usage
  - Write a SAS program (usually a few lines)
  - Highlight code and click the “running man”, or press F8
  - Inspect the log for warnings or errors
  - Review the output, if any expected
  - Repeat as needed
- SAS programs can also be run in “batch mode” but we won’t cover this

# Two basic parts to a SAS program

- DATA step
  - Read, generate and/or modify data
  - Create a SAS data set
- PROC step (PROC is short for “procedure”)
  - Perform analyses and/or generate graphs
  - Output results
- Most SAS programs start with a DATA step that prepares data for a PROC step

# Example SAS Program

```
example_program.sas *  
1  *example program;  
2  
3  data grades;  
4      input name $ grade;  
5      datalines;  
6  Clay 89  
7  Michele 99  
8  Chelsea 94  
9  ;  
10 run;  
11  
12 proc means data=grades;  
13     var grade;  
14 run;
```

# SAS Programming Conventions

- End every line with a semicolon ( ; )
- Not case-sensitive (*NAME=Name=name=nAmE*)
- SAS programs end with `.sas` extension
- A SAS program is just a text file
- SAS data sets end with a `.sas7bdat` extension
- Add comments between `*...;` or `/*...*/`
- End DATA and PROC steps with `run;`
- Turn on **Show line numbers** in **Tools -> Options -> Enhanced Editor**

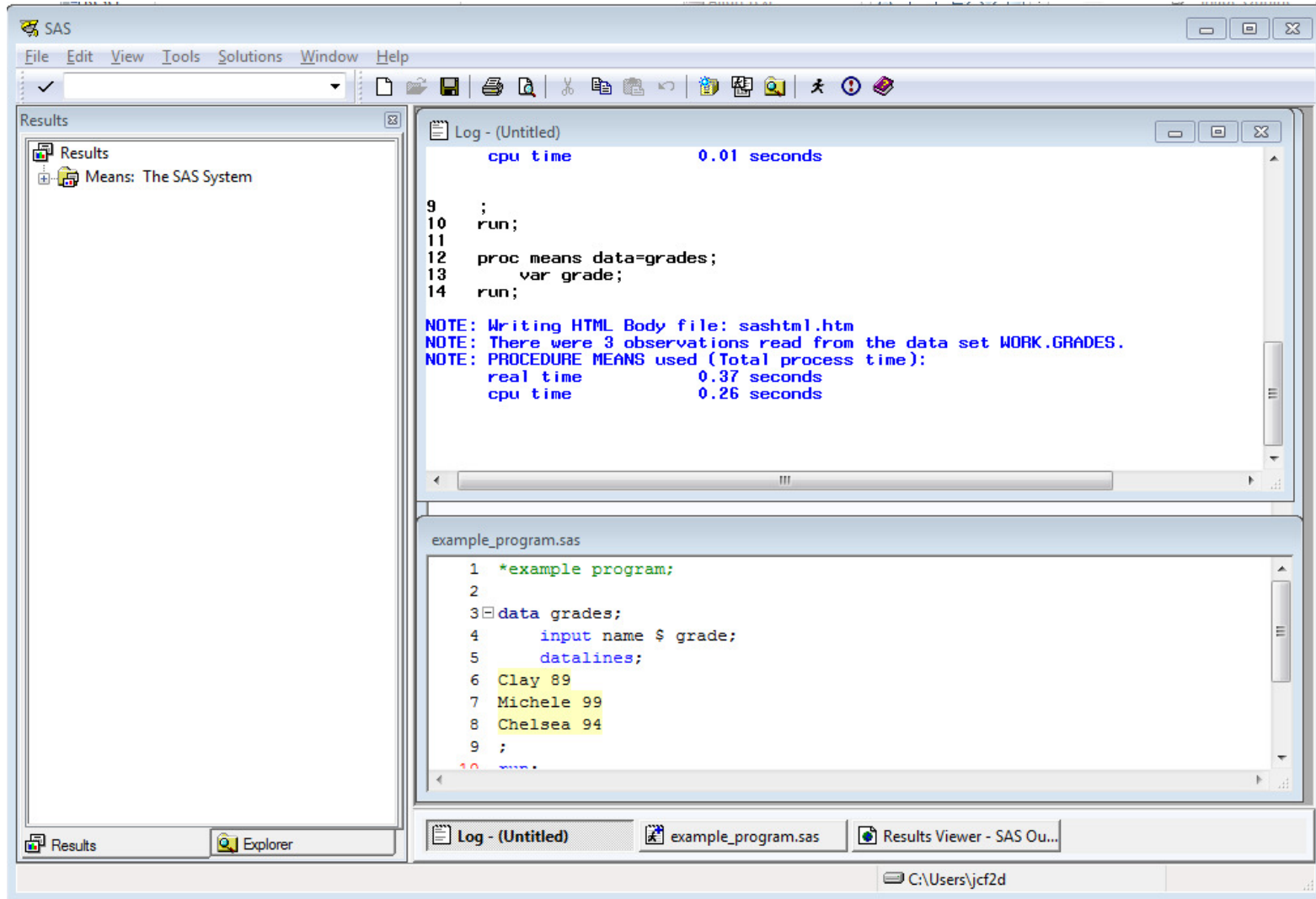
# The SAS Environment

You typically work with four windows:

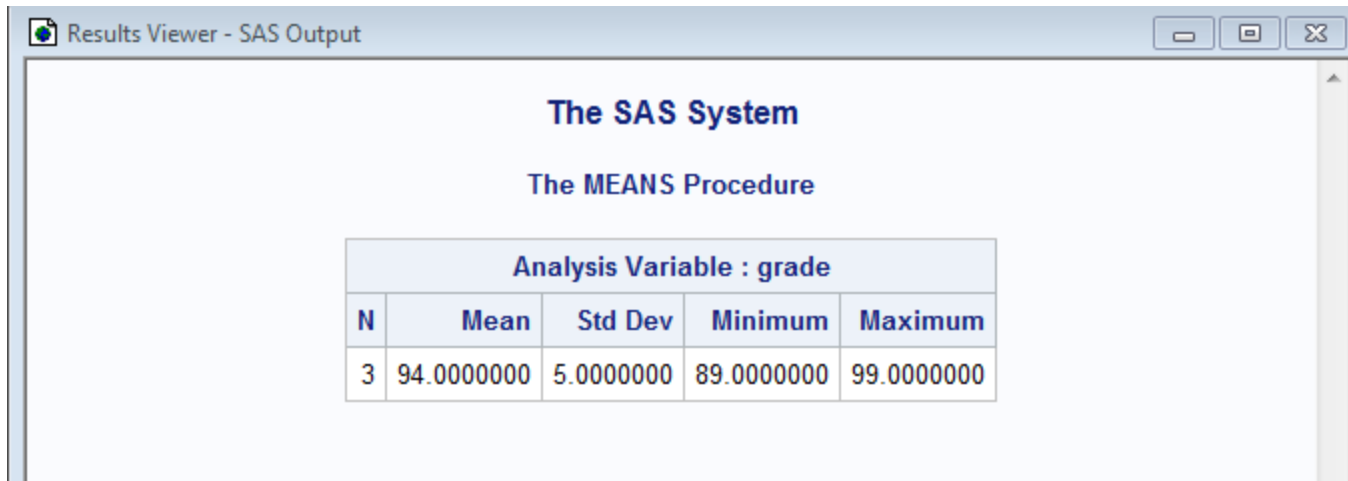
1. The editor
2. The log
3. The results
4. The results viewer



# SAS program and log



# SAS results viewer



The screenshot shows a window titled "Results Viewer - SAS Output". Inside the window, the text "The SAS System" and "The MEANS Procedure" is displayed. Below this, a table titled "Analysis Variable : grade" is shown. The table has five columns: N, Mean, Std Dev, Minimum, and Maximum. The data row shows N=3, Mean=94.000000, Std Dev=5.000000, Minimum=89.000000, and Maximum=99.000000.

Analysis Variable : grade				
N	Mean	Std Dev	Minimum	Maximum
3	94.000000	5.000000	89.000000	99.000000

# Handy SAS hot keys

- Select text from start of block: **Shift + Down Arrow**
- Submit highlighted code (ie, run code): **F8**
- Wrap selection (or current line) in a comment: **Ctrl + /**
- Unwrap selection (or current line) from a comment: **Ctrl + Shift + /**
- Convert selected text to upper case: **Ctrl + Shift + U**
- Convert selected text to lower case: **Ctrl + Shift + L**
- Go to line: **Ctrl + G** (prompts for a line number)
- Clear log or results viewer: **Ctrl + E**
- To start a new SAS Program: **Ctrl + N**

# Let's go to SAS

I have written a SAS file for today's workshop:

`intro_to_sas_workshop.sas`

This allows you to reproduce what I have already done in SAS.

To follow along, simply highlight SAS code as we get to it and hit **F8** (or click the running man)

Feel free to add comments or modify the program.

Let's go to SAS!

# Getting Help/Going Further

**Google!**

## **Books**

Learning SAS by Example (Cody)

The Little SAS Book (Delwiche & Slaughter)

Statistical Programming in SAS (Bailer)

## **Web Sites**

<http://www.ats.ucla.edu/stat/sas/>

<http://support.sas.com/training/tutorial/>

# UVa StatLab

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