

# STA 303 / 1002

## Using SAS on CQUEST

A review of the nuts and bolts

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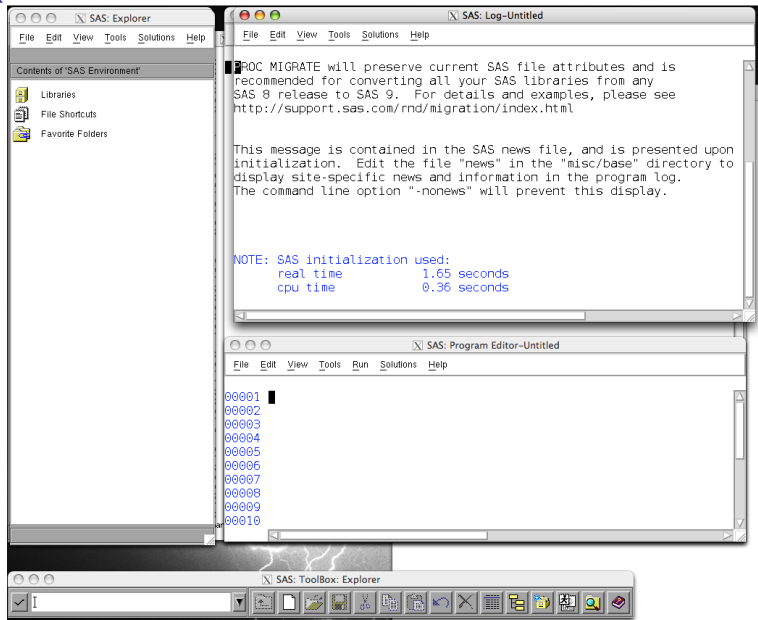
# Some Basics of CQUEST

- ▶ If you don't already have a CQUEST account, go to [www.cquest.utoronto.ca](http://www.cquest.utoronto.ca) and request one. Do that **NOW**.
- ▶ The CQUEST labs are in RW 107, 109 and 211.
- ▶ Go to [www.cquest.utoronto.ca](http://www.cquest.utoronto.ca) to find out:
  - ▶ hours of operation of the CQUEST labs
  - ▶ when labs are booked by other classes
  - ▶ how to get access to CQUEST printers
- ▶ The operating system in the RW labs (107/109 and 211) is Windows XP. There are a few terminals in RW 213 running Linux. SAS is run from a Linux server. Your account is the same and files are accessible in all labs / operating systems.
- ▶ To logout:
  - ▶ Windows: look under *Start*
  - ▶ Linux: look under *System*
- ▶ To open a web browser:
  - ▶ Windows: *Firefox* is an icon on your desktop.
  - ▶ Linux: *Firefox* is the mouse on a globe icon on the toolbar.

## Some Basics of CQUEST – 2

- ▶ If backspace doesn't work in SAS, turn off Num Lock.
- ▶ Use the Insert key to toggle between insert and type-over modes.
- ▶ The SAS Windowing Environment on CQUEST (Linux) is similar to the version of SAS I'll demonstrate in lecture (MS Windows).
- ▶ I'm running SAS version 9.2 in lecture. The version in CQUEST is 9.3. I won't do anything for which this makes a difference.
- ▶ Starting the SAS Windowing Environment
  - ▶ MS Windows in a CQUEST lab: Under *Start* choose *Statistics Apps* and then *SAS*
  - ▶ Linux machine in RW 211: Under *Applications* choose *CQUEST* and then *SAS*
  - ▶ You will have to enter your CQUEST password.
  - ▶ Double-clicking on a previously saved SAS program doesn't work. To open a previously saved program, open SAS and then choose *File > Open*.

# A Picture of the SAS Windowing Environment on CQUEST



## Starting the SAS Windowing Environment continued

Many windows will open including:

- ▶ a program editor where you type your SAS program
- ▶ a log window
- ▶ an output window
- ▶ an explorer for navigating through your windows and output
- ▶ a graphics window will open once you've run a program that produces graphics plots (except if the plots are produced using the Output Delivery System (ODS))

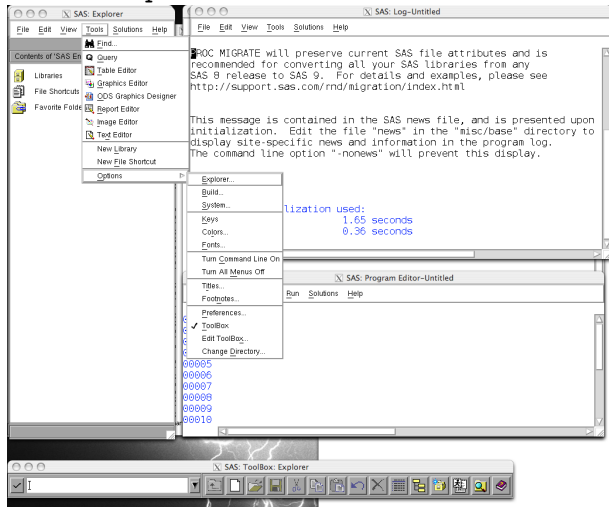
The first step for your assignments will be to save the data from the assignment web page into your CQUEST home directory.

# IMPORTANT FIRST STEP

The version of SAS on CQUEST is 9.3. By default, this version of SAS uses ODS to save output in an html file sashtml.htm.

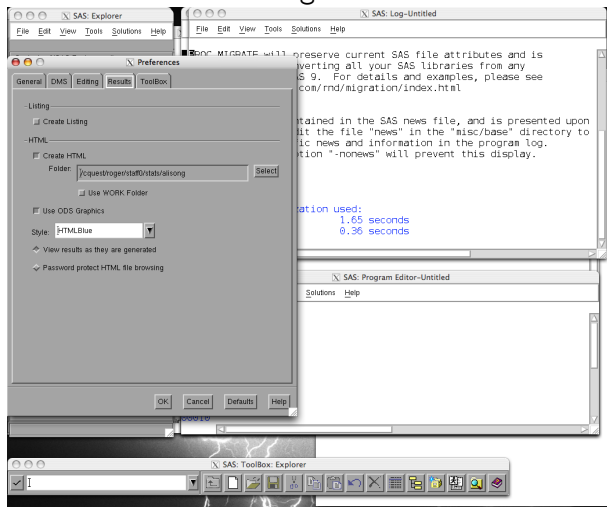
**TURN THIS OFF.** (ODS graphics is OK.) To do this:

Tools > Options > Preferences...



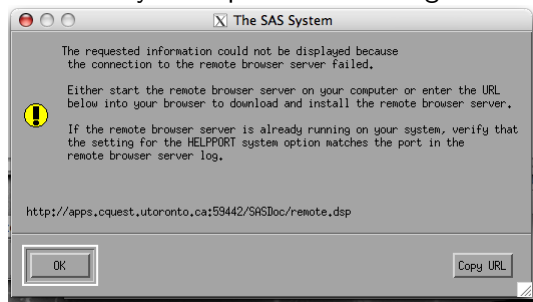
# IMPORTANT FIRST STEP continued

## Select: Create Listing



## SAS Help on CQUEST a.k.a. What else can go wrong?

The SAS help is not completely installed on CQUEST. You may accidentally end up with this dialogue box.



If you do, everything will stop until you click OK.

Don't use the SAS help. What you can find on the internet is better.



## More on the SAS Windowing Environment

- ▶ To insert a line after the current line in the SAS program editor, type an `i` in the leftmost column over the first zero and hit enter. (For more tricks you can use in the SAS program editor, google “SAS Text Editor Line Commands”.)
- ▶ To run a program: Make the program editor window your primary window (click on it) and click on the running man or select `Run` and then `Submit`. Running a program writes output to a log window, an output window (if the program ran without errors) and sometimes a graphics window. Your code will also disappear. To get it back under `Run` select `Recall last submit`.
- ▶ Note that you need to save your program, your output, and your log separately if you want to keep them.
- ▶ Graphics plots (produced by ODS graphics) are saved in `.png` files in your Home directory (despite what directory you're working in).

## SAS Log Window (or .log file)

Messages from SAS about your program written when you run it.

**Always check for ERRORS.**

# Basics of SAS Programming

- ▶ Every line ends with a semi-colon.
- ▶ SAS is not case sensitive; GIBBS and gibbs are the same within a program.
- ▶ Every line ends with a semi-colon.
- ▶ Anything between `/*` and `*/` is a comment.
- ▶ You can also comment out a single line by starting with a `*` but then it must end with a semi-colon.
- ▶ A typical SAS program has data steps (to create and manage your datasets) and procedures starting with the reserved word `proc`.

## More Basics of SAS Programming

- ▶ Use `run;` after every procedure.
- ▶ You can add titles to your output with the command `title 'This is my title';` at the beginning of your program or within any procedure.
- ▶ SAS has crazy ideas about line lengths. To fix this make options `linesize=79;` the first line of your program. (There are many other options you can set, but this is the only one that is essential.)
- ▶ Every line ends with a semi-colon.
- ▶ For more basics of SAS programming, see the extended version of these slides used in STA 302 at <http://www.utstat.utoronto.ca/alisong/Teaching/1112/Sta302/SASlecture.pdf>

## Where is my ...

### ▶ *Data?*

- ▶ You need to store the data file (download it from the assignment web page) on your CQUEST account. You can work in your home directory, or create new directories to organize your account.

### ▶ *Output?*

- ▶ Check the log file for errors. Errors can stop the creation of the output listing.
- ▶ If there are no errors in the log file and the output window is empty, you probably have ODS output on. Go back to “IMPORTANT FIRST STEP”. Note that an option is selected if the button is dark (pushed in).

### ▶ *Plot?*

- ▶ (Unless you've turned off ODS graphics) Your plots will be stored as `graphicsfilename.png` in your home directory. The filename varies, depending on the type of plot and the procedure that created it. If more than one plot of this type is created within your program, the second is called `graphicsfilename1.png` and the third is called `graphicsfilename2.png`, etc.

## Accessing CQUEST Remotely

- ▶ Mac: Use an X11 terminal window. Command:  
`ssh -X -l cquestuserid login.cquest.utoronto.ca`
- ▶ Windows: need PuTTY and Xming (free downloads). See the course announcements on Blackboard for a link to complete instructions to set this up.
- ▶ All files will be on CQUEST and **not** on the computer you're working on. So the data file needs to be saved on your CQUEST account and SAS output will be on CQUEST. Use an sftp program to transfer files. For example, to print SAS output at home you'll need to transfer the files to your home computer. (I recommend the sftp programs WinSCP for MS Windows and Fugu for Mac OS X; both can be downloaded for free.)
- ▶ To start SAS, type `sas` at a command prompt.

## I want to use CQUEST from home, but it's too slow

- ▶ Try using batch mode. In batch mode, you create your SAS program using the editor of your choice and run it at a command prompt.
- ▶ Store your program in a (text) file called `filename.sas`. To run it, at a command prompt type `sas filename`. This creates `filename.log` and, if your run was successful, `filename.lst` and any plots in `.png` files.
- ▶ To see the output, use a text editor to view `filename.lst`. You can see your graphics files by typing `display graphicsfilename.png` at a command prompt.
- ▶ To print your output or plots, sftp them to your home computer using WinSCP or Fugu and then print them from your home computer.
- ▶ If any of your SAS batch jobs have a problem and keep running, you must kill them. Type `ps` at a prompt to get the number of the SAS job (the PID), and then type `kill -9 thePIDnumber` to kill a job.

## A Few Unix Commands

These may be useful when accessing CQUEST remotely.

`exit` Logs you off.

`passwd` Change your password.

`man command` Unix help for command.

`ls` List the files in the current directory.

`mkdir directoryname` Make a new directory.

`cd directoryname` Change directory to directoryname.

`cd` Change to your home directory.

`less filename` Displays filename on your screen. (q to quit.)



## A Few Unix Commands continued

`rm filename` Removes filename.

`cp filename1 filename2` Copies filename1 to filename2.

`mv filename1 filename2` Moves (renames) filename1 to filename2.

**Editors:** Try `nano filename`. Nano is an extremely easy to use text editor that doesn't require any instruction. My favourite Unix editor is `vi` but you need to learn about it before you use it. If you google "vi unix editor" you'll find some good tutorials.