

# Instructions for Computing in Statistics 401

A substantial part of Statistics 401 requires the use of a statistical computing program to analyze data. I use the statistical computing program *SAS* in all my examples and provide *SAS* code on the course web site. During the first part of the course, the homework problems that involve computing will seldom require you to do more than run *SAS* programs provided on the course web site, examine the output, and write down your answers. Eventually you will need to write your own *SAS* programs, but this usually can be accomplished primarily by copying and pasting from one or more of the programs provided on the web site.

Students need to be able to access the internet and *SAS* from a computer on or off campus. On-campus students have access to both the internet and *SAS* through personal computers (PCs) in many on-campus computing labs. This is likely to be the most user friendly environment for students familiar with the Windows operating system. At last report, *SAS* was installed on Windows machines in one of the public PC rooms in Durham, Snedecor 321 and 322, Mackay 108, Agronomy G528, Lagomarcino W205, and several departmental or lab computing rooms on campus.

It is also possible to use *SAS* from a computer on which *SAS* is not installed as long as the computer is connected to the internet. To use *SAS* in this manner you need to have an Iowa State University Network-ID. You already have an ISU Network-ID if you have an @*iastate.edu* e-mail address. Your Network-ID is the part of your @*iastate.edu* email address that comes before @. (Mine is *dnett* because my e-mail address is *dnett@iastate.edu*.) If you do not already have a Network-ID, visit <http://www.ait.iastate.edu>, click on the "Getting Connected" link on the right side of the page, and follow the instructions. Once you have your Network-ID, you may run *SAS* in batch mode using a *HostExplorer* telnet window as described later in this handout.

## Running SAS from a PC on which SAS is Installed

1. Double click the *SAS* icon located on the Windows desktop or click the *Start* button in the lower left corner of the screen, select *Programs*, and select *SAS* from the list of programs that should appear.
2. There are three main window in *SAS*: *Editor*, *Log*, and *Output*. Near the bottom of the screen, you should see three buttons with the labels *Editor*, *Log*, and *Output*. If the *Editor* window is not already activated, activate it by clicking the *Editor* button.
3. Enter your program in the editor window. Often this can be most easily accomplished by copying code from the Statistics 401 web site and pasting it into the *Editor* window. If you are use *Internet Explorer* as your web browser, clicking on a *SAS* file name on the Statistics 401 web site may automatically complete steps 1 through 3 depending on the local settings of the machine you are using.
4. Run your *SAS* program by clicking on the button that has a figure of a person running. This button should be located near the top of the screen. If you do not see the button, click on *Run* near the top of the screen and then click on *Submit* in the drop-down menu that should appear.

5. Activate the *Log* window by clicking on the *Log* button at the bottom of the screen. Check the *Log* for errors which should be indicated with red text. Correct errors, make sure the *Editor* window is activated, and rerun the program as necessary.
6. Active the *Output* window by clicking on the *Output* button at the bottom of the screen. The *Output* window contains the results of your program. Make note of the relevant parts of the output, copy it and paste into a word processor document for later viewing if you wish, or (if absolutely necessary) print it by clicking *File* near the top of the screen and clicking *Print* in the drop-down menu that should appear.
7. If you wish to save your *SAS* program, activate the *Editor* window, click *File* near the top of the screen, and click *Save As...* in the drop-down menu that should appear. Save the file in a location where you can access it again – perhaps to a personal floppy, zip disk, or CD.
8. End *SAS* by clicking the X in the upper right corner of the screen.

### **Running SAS in Batch Mode Using a HostExplorer Telnet Window**

*HostExplorer* should be installed on most on-campus PCs. If you wish to work from home on your own PC, you need to download and install a free copy of *HostExplorer* provided by Iowa State University. You need to obtain *Scout* software (a utility helps you download and install site-licensed software) and use *Scout* to install *HostExplorer*. Instructions for completing these tasks can be obtained by clicking on the “Downloads” link at <http://www.ait.iastate.edu>. If you do not have a high-speed internet connection and downloading time is excessive, you may wish to obtain a Solutions! CD available for \$4 from the Durham Center at Iowa State University. Once you are working from a PC on which *HostExplorer* is installed, you may access *SAS* as follows.

1. Start *HostExplorer* by clicking on its desktop icon or by clicking the *Start* button in the lower left corner of the screen, selecting *Programs*, and selecting *HostExplorer* from the list of programs that should appear.
2. An *Open Session* window should appear. If you have previously created a session profile, double click its icon. Otherwise create a new session profile by clicking the *New Profile* button. You will be prompted for a *Profile Name*, *Profile Type*, and a *Host Name*. Enter any profile name of your choosing, select *VT* as the profile type, and enter *isua.iastate.edu* as the host name. A new icon should appear in the *Open Session* box. Double click this icon.
3. Enter your ISU Network-ID at the *login:* prompt.
4. Enter your ISU Network-ID password at the *password:* prompt.
5. Several messages may appear. Once you progress to the point where you see a *vincent%* prompt, you are ready to begin work. If you have not already done so, create a directory to hold your Statistics 401 work. Type *mkdir stat401* at the *vincent%* prompt.
6. Move into your Statistics 401 directory by typing *cd stat401* at the *vincent%* prompt.

7. Type *add sas* at the *vincent%* prompt. You should see many messages that are typically safe to ignore.
8. Type *pico filename.sas* at the *vincent%* prompt. (Here *filename* can be any name that you choose. You will often want to choose a filename that matches one of the filenames on the Statistics 401 web site.)
9. Enter your file into the *pico* editing window that will appear. You may wish to copy *SAS* code from the course web site and paste it into the *pico* editing window. To copy from the course web site, click the name of the *SAS* file that you wish to run, highlight the text that should appear, select *Edit* and then *Copy* from menu near the top of your browser window. To paste into the *pico* editing window, click *Edit* and then *Paste* near the top of the *HostExplorer* window.
10. While pressing and holding the *control* key (*ctrl*), hit the *x* key. Hit the *y* key when asked if you wish to save the file. Then press the return key to accept the file name suggested (or edit the filename as you wish).
11. Type *sas filename.sas* at the *vincent%* prompt to run your program.
12. When the *vincent%* prompt returns, type *ls* to see a list of all the files in your *stat401* directory. If the program ran properly, you should see new files by the names of *filename.log* and *filename.lst* which contain the contents of the *SAS Log* and *Output* windows, respectively.
13. To view any file, type *cat filename.extension* at the *vincent%* prompt, where *filename* is any name and *extension* is the three-character extension (e.g., *sas*, *log*, or *lst*). If you would like to page through the file a page a time rather than scrolling through the file, use *more* instead of *cat*. Also, you can always look at the contents of a file by typing *pico filename.extension* at the *vincent%* prompt.
14. You may wish to copy the *SAS* output to a word processor file for storing or printing from your PC. One of the easiest ways to do this is to type *cat filename.extension* at the *vincent%* prompt, scroll up to the beginning of the file, use the mouse to highlight the desired output, select *Edit* near the top of the *HostExplorer* window, select *Copy* from the drop-down menu, and paste into a word processor window that you open from your PC. You can also transfer files between your PC and your ISU account using FTP, but that will not be described in this handout. By default, the *HostExplorer* window only keeps track of the last 100 lines of a file that is displayed on the *HostExplorer* window using *cat*. This is a problem if your output file is more than 100 lines long. You can fix this problem as follows. From near the top of *HostExplorer* window, click *Options*, click *Edit Session Profile...*, double click *Display*, click *General*, change *Lines Available in Scrollback* from 100 to 1000, and click *OK*.
15. When you are finished using *HostExplorer*, type *exit* at the *vincent%* prompt, click the X in the upper right corner, and click *Yes*.

## Summary of some useful commands that can be issued at the vincent% prompt

<b>cat</b> <i>file.ext</i>	Display the contents of <i>file.ext</i> .
<b>cd</b>	Return to your home directory.
<b>cd</b> <i>directoryname</i>	Move from the current directory into <i>directoryname</i> .
<b>cp</b> <i>file1.ext file2.ext</i>	Makes a copy of <i>file1.ext</i> and names it <i>file2.ext</i> .
<b>exit</b>	Log out of your account.
<b>ls</b>	Lists all files in a directory.
<b>more</b> <i>file.ext</i>	Display the contents of <i>file.ext</i> one page at a time.
<b>pico</b> <i>file.ext</i>	Edit <i>file.ext</i> .
<b>rm</b> <i>filename.extension</i>	Removes (deletes) a file from your directory.