Lab, accounts(UCID, AFS), Programs, Linux

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Disclaimer: *These abbreviated notes DO NOT substitute the textbook for this class. They should be used IN CONJUNCTION with the textbook and the material presented in class. If there is a discrepancy between these notes and the textbook, ALWAYS consider the textbook to be correct. Report such a discrepancy to the instructor so that he resolves it. These notes are only distributed to the students taking this class with A. Gerbessiotis in Fall 2013 ; distribution outside this group of students is NOT allowed.*

AFS and UCID

0.0 ist.njit.edu Familiarize yourselves with the NJIT IST web-page. If you create a login name (in NJIT parlance it is called UCID) and its corresponding password, you can do it online through that page. To avoid chicken-and-egg problems (connection requires a UCID that you don't yet have) go to the NJIT library, do it from a friend's machine at NJIT who did it first, or from home (it may not work), or may from the Support office at the basement of the parking deck. If you click on `directory.njit.edu` and write your last-name/first-name you might find out your UCID if it as already set up for you.

0.1 UCID account creation. One can obtain a UCID account (a pair of UCID login and UCID password), by going to
`http://ist.njit.edu/accounts/index.php`
Click on the Services link on the left that will then expand; its first link `Accounts` can be clicked to also expand it. The two choices of interest is the first link `UCID` under `Accounts` for `University Computing ID (UCID)` and the sixth link `Password`.

0.2 AFS password. Unless you matriculated to NJIT long time ago, your AFS login IS your UCID. The AFS password might or might not be the same. If your current UCID password does not work, try the `Password` link above and reset all your passowrds to a new `UCID` password (that will then change). Or read the next step.

0.3 Password reset. To reset your AFS password so that it is the same as the UCID password, you should know your UCID login and UCID password. Either `http://ist.njit.edu/support/afs/afspassword.php`
or `http://afspassword.njit.edu/`
will work. Scroll down and click on option 3 (Make all passwords the same as your UCID password).

0.4 Helpful URLs (URL stands for Uniform Resource Locator).

1 **NJIT IST Central:** `http://ist.njit.edu`

2 **NJIT Accounts:** `http://ist.njit.edu/accounts/index.php`

3 **NJIT Software:** `http://ist.njit.edu/software/download.php`

4 **NJIT Password Management:** `http://ist.njit.edu/support/password/index.php`

5 **NJIT Password Reset:** `http://afspassword.njit.edu/`

6 **NJIT Password Reset (same):** `http://ist.njit.edu/support/afs/afspassword.php`

7 **AFS resources/help:** `http://web.njit.edu/`

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0.5 Login screen preliminaries. In order to login on any of the lab machines, you need to provide a login name and password in the popped-up Login Window. In addition, certain options might be set up by clicking buttons and selecting options through them. In order to login, you must know your UCID login and the corresponding AFS/UCID password.

Numlock? key Before you do anything, make sure that there is no light ON on the top of the keyboard. If the `Numlock` light is ON you can leave it as is, or switch it OFF by pressing once the `Numlock` key which is usually located in the numerical keypad on the right part of the keyboard (over `key 7` and to the left of `key /`).

CAPS LOCK? key If the `CAPS LOCK` light is ON, it MUST BE TURNED OFF by pressing the `CAPS LOCK` key once (or if this does not work, the `SHIFT` key instead). The `CAPS LOCK` key is usually located on the left of the `A key`.

0.6 Login Option Selection. Before you type in the login or password, click on one of buttons located beneath the login/password textbox. Select there the `Gnome Desktop` or `GNOME` option.

0.7 Login Name and Password. The input field has a label on top of it or the left of it `User name` or `login` that prompts you to submit your login. Type it in and press the ENTER key. The label `Password` signifies the text field that is ready to accept your password. Type it in, and then press ENTER. If you made a mistake and typed an incorrect password wait until a diagnostic pops up with instructions to retype the password. Sometimes the password text field gets reset (cleared up) and the system is ready to accept your correctly typed password. If there are no labels on the side of the text-boxes, the topmost text box is the one accepting the login name and the bottom one the password.

0.8 Environment. After a while you will get logged on. The status bar is on the top of the screen as opposed to MS Windows that is usually located at the bottom. Click on the left of the three or four buttons at the top. Options of interest are `Internet` if you plan to start the Firefox browser, or `Mathematical/Scientific applications` for `Matlab`. Explore the environment if you have not encountered it before.

0.9 Screen Saver Headaches/ Logout. Never leave the workstation idle for more than 10 minutes or so. The screen saver will pop up and this usually means you will be typing your password to get in again! Make sure you **LOG OUT SOON AFTER THE CLASS ENDS BEFORE YOU LEAVE THE LAB**. If you don't and the screen saver pops up fellow students won't be able to use that workstation!

Login window and Desktop

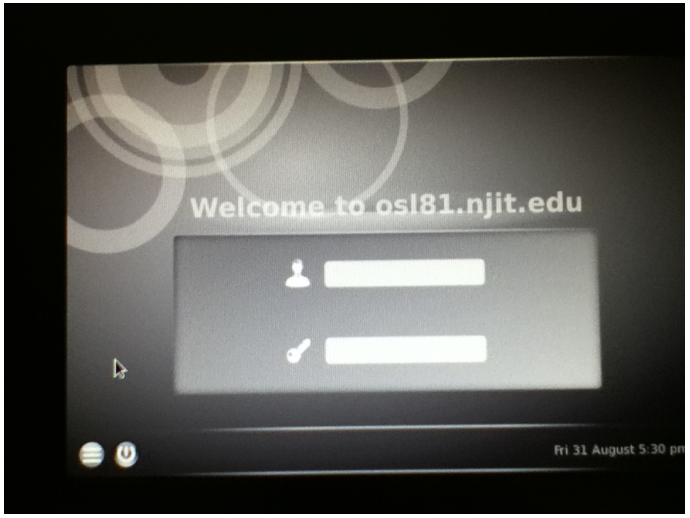


Figure 1: Login window

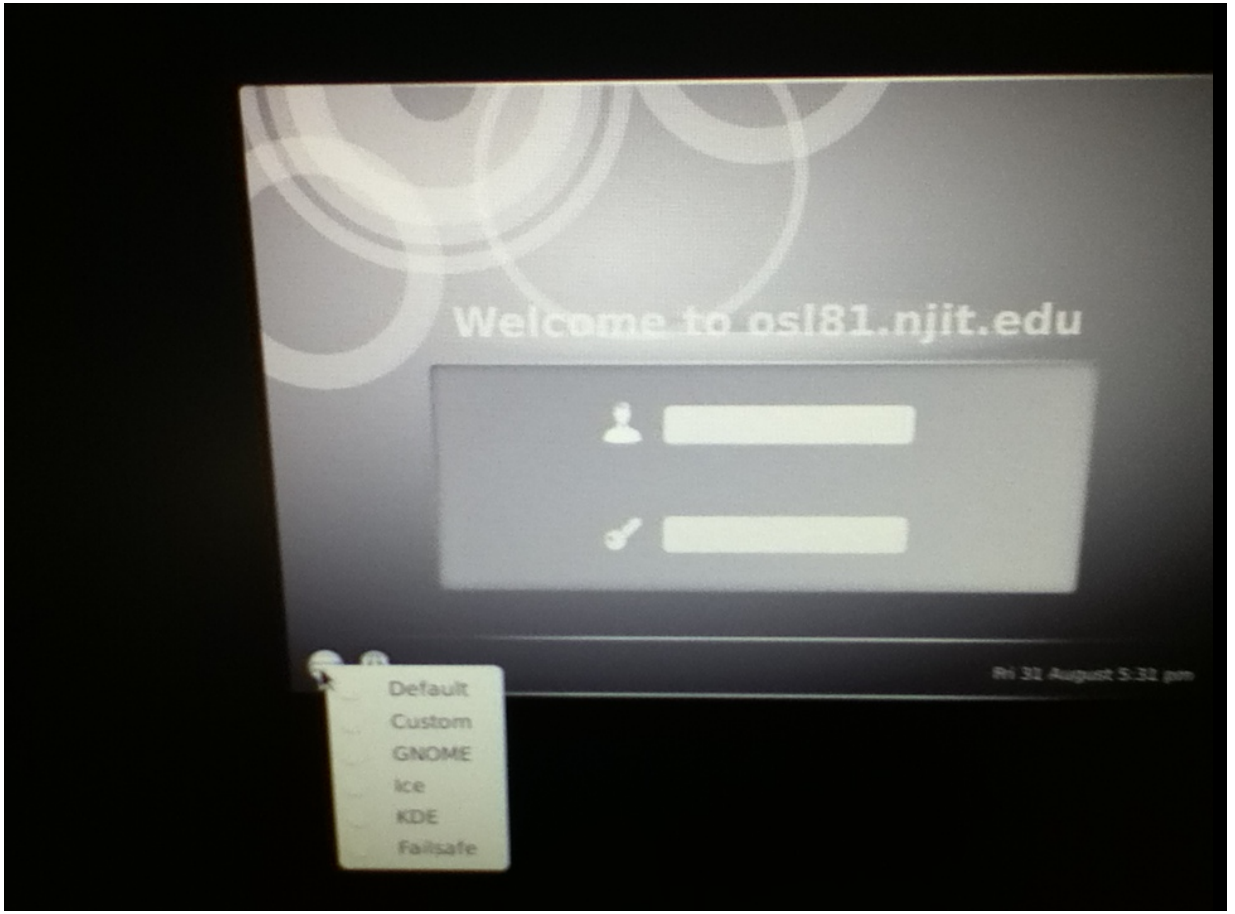


Figure 2: Selecting a Desktop (GNOME)

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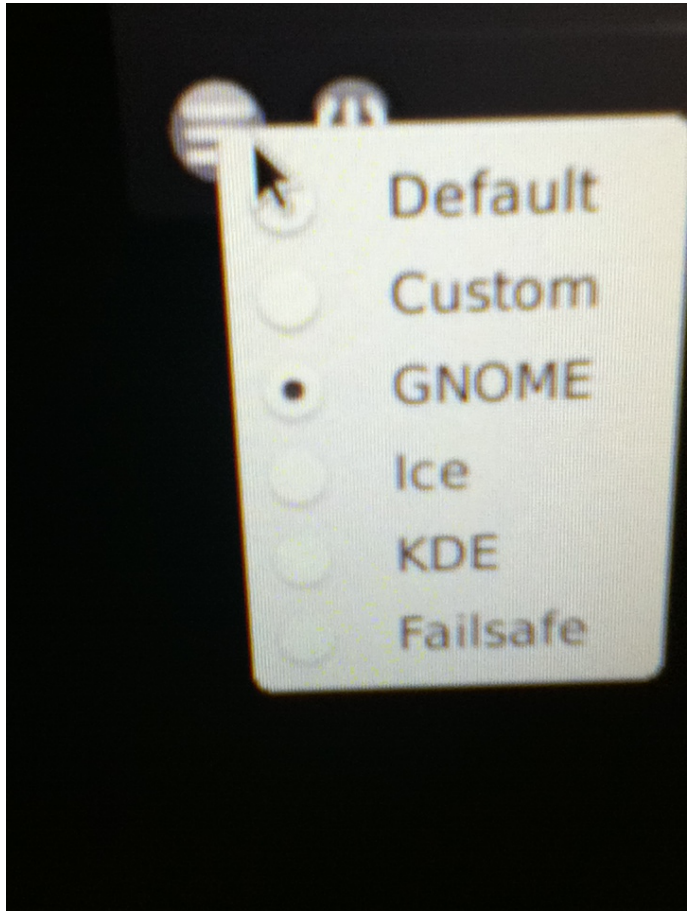


Figure 3: GNOME selected

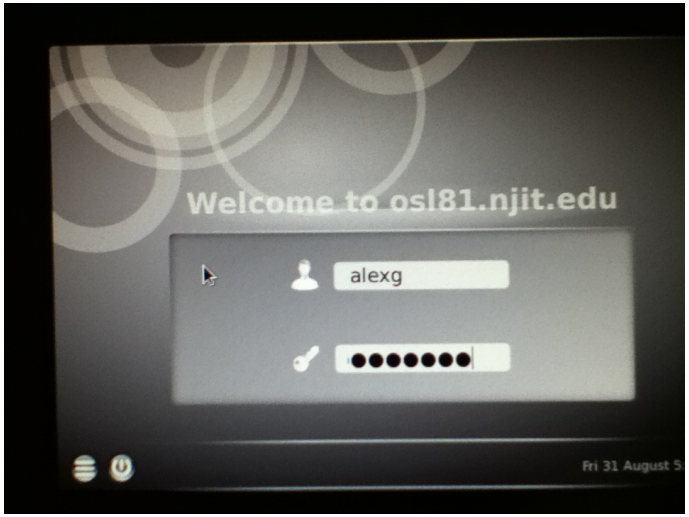


Figure 4: Ready to type in AFS login and password

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0.10 Login screen(s) (previous two pages). With reference to Figures 1, 2 and Figures 3, 4 we highlight the following

- Obtain a Welcome screen such as Figure 1 by hitting the ENTER key on the keyboard. A black screen my turn into Figure 1.
- Click on the icon on the bottom left corner as shown in Figure 2 to obtain the Desktop selection subwindow shown there. Make sure you click on GNOME as shown in Figure 3.
- Enter the AFS login (in my case, alexg is shown), and then, type in the box below the AFS password. This step assumes that you know both of them. Note that the password does not show on screen. After you press ENTER the second time (password field) the login process commences.
- If authentication fails, an error message will be printed with a suggested action.

0.11. Software. You can complete all coursework in from of the Lab workstations or use any lab at NJIT that has MATLAB. If you plan to work on your own machine (laptop or desktop) and your own OS (MS Windows, Linux, or OSX) then you might need to donload one or all of the following programs. The URL for downloading software at NJIT is the Softare link in section 0.4 (third link there) of this Subject. All software downloading must be done from WITHIN NJIT.

1. **Matlab.** The appropriate version of MATLAB for your OS (Windows, Linux, OSX) and the type of your OS (32-bit or 64-bit). If you don't know the type download the version that explicitly says 32-bit or DOES not say 64-bit! Whether it is 2013a or 2013b or 2011 it does not matter. And make sure you download a student version!
2. **SSH aka Secure Shell.** A version for MS Windows is available for download. OSX and Linux have one preinstalled (but it is command-line based).
3. **CISCO VPN client.** In order to connect from home (i.e. outside of NJIT) you need to download and install this software that makes your machine part of NJIT network. OSX has its own version; you need to figure out how to locate it, and configure it however.

You can work with MATLAB in one of the following ways.

OPTION 1: USE lab machines for programming. You can complete all required course work by sitting in front of any of the AFS workstations in the Lab or other Labs at NJIT that have MATLAB.
OPTION 2: Download MATLAB. Alternatively, you can download and install MATLAB on your Windows, Linux, or MAC OSX PC or laptop. For this you need to do all of the following

(a) Download MATLAB through the Software link (third link) specified in section 0.4. The UCID login and UCID password would be needed. It is better if you complete this download step from within NJIT i.e. have your laptop/desktop connected to the NJIT nework directly. Otherwise you will need the CISCO VPN client, to download MATLAB from home and install it.

(b) Register the downloaded copy with MathWorks, the company that owns MATLAB. Follow those instructions as needed; you might need to create an account with them using your NJIT email address or not. DO NOT USE FOR that the UCID password.
OPTION 3: Connect to a machine that has MATLAB from your laptop.

This step assumes familiarity with the MS Windows command window, or a Linux/Unix/OSX terminal.If you lack this familiarity, it's better if you ignore this option. On your Windows/Linux/OSX machine you can still connect to NJIT and run MATLAB on an NJIT workstation remotely and still do your work. This requires the downloading and installation of SSH. You may also need to install VPN if you plan to do it from home. Using SSH connect then to `afsconnect1.njit.edu` or `afsconnect2.njit.edu` and you will be given a terminal (i.e. a command Window in Windows parlance). If you are familiar with them (or go on reading this Subject otherwise) you can type matlab to open a slightly different matlab environment. With VPN you may connect to the machines of the lab that have domain names `oslXY.njit.edu`, where X, Y are decimal digits, eg. `osl21.njit.edu`.

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0.12 Unix commands. If you open a terminal on an AFS machine, then you need to know how to navigate around a UNIX terminal. This is quite similar to navigating around a Windows command line prompt (known as `cmd` or `cmd.exe`). Below we provide an equivalent list between UNIX and Windows command line commands.

	Windows/Command Prompt	UNIX afs	Comment
%	dir	ls	List files in local directory
%	dir /?	man ls	Help for command
%	dir /S	ls -lR	Recursive listing (subdirectories)
%		ls -a	List hidden files+everything else
%	cd dirname1/dir2/dir3	cd dirname1/dir2/dir3	Go to dir3
%	cd C:\	cd	Return to home directory
%	cd ..	cd ..	
%	date	date	
%	time	time	
%	[Acrobat invocation]	acroread	
%	[Firefox invocation]	firefox	
%	[Matlab invocation]	matlab	
%	[ssh invocation]	ssh osl21.njit.edu -l UCID	Connect to AFS machine osl21 as USER UCID
%		scp FILE UCID@osl21:~/	Copy securely file FILE to the account UCID of osl21 at the top-directoy
%		who	Who is logged on
%		ps	Process Status
%		ps agux|egrep UCID	Check user's UCID processes
%		kill -9 PID	Kill a process with number (as shown with ps) PID
%		kill -9 9454	Will log you out (see bottom of next page)

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```
%    exit                    exit                    Terminate(and logout in UNIX)
%    exit                    logout                  Terminate(and logout in UNIX)
%                            pwd                     Print working directory
%    cat                     cat                     Catenate/Concatenat files
%                            cat x >y                "Copy file x to file y"
%                            cat x >>y               "Append x file to file y"
%    copy x y                cp x y                  "Copy file x to file y"
%    more                    cat, less, more         list contents of file
%                            cp -i                   copy and inquire to confirm
%                            cp -r                   copy recursively (directories)
%                            cp -r dir1  dir2        copy directory dir1 to dir2
%    mv                      mv                      move
%    del                     rm                      remove
%                            rm -r                   remove recursively a directory
%    md                      mkdir
%    rmdir                   rmdir
%    cls                     clear
%    echo                    echo
%    fc                      diff
%    find                    grep egrep
%    command /?              man command
%    chdir                   pwd

Sample Output of ps agux|egrep UCID
UCID      9454  0.0  0.3 3360 2640 pts/5    S 10:55:43  0:00 -tcsh
UCID      9484  0.0  0.1 1304 1056 pts/5    S 10:55:46  0:00 /bin/sh ./proxy.sh
UCID      9486  0.0  0.4 5488 3784 pts/5    S 10:55:46  0:00 ssh -N -v -D3000 l
```

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0.12 Connect with Secure Shell. On a Windows machine, click on a Secure-Shell icon if available or invoke Secure-Shell through the Start button. The window of Figure 5 will pop, click on the pane(area) `QuickConnect` to get a smaller popped up window also shown in Figure 5. Type in the field `Host Name` the afs machine you will be connected to (`afs12.njit.edu`) and in the `UserName` field, type in your `AFS-login` (i.e. UCID) and be ready for the password, after you click `Connect`. The first time you connect to `osl21.njit.edu`, the window in Figure 6 might pop-up (and click on Yes in such a case), or otherwise you get the Password prompt in Figure 7. Lab machines now bear names starting with `osl` as in `osl12.njit.edu`.

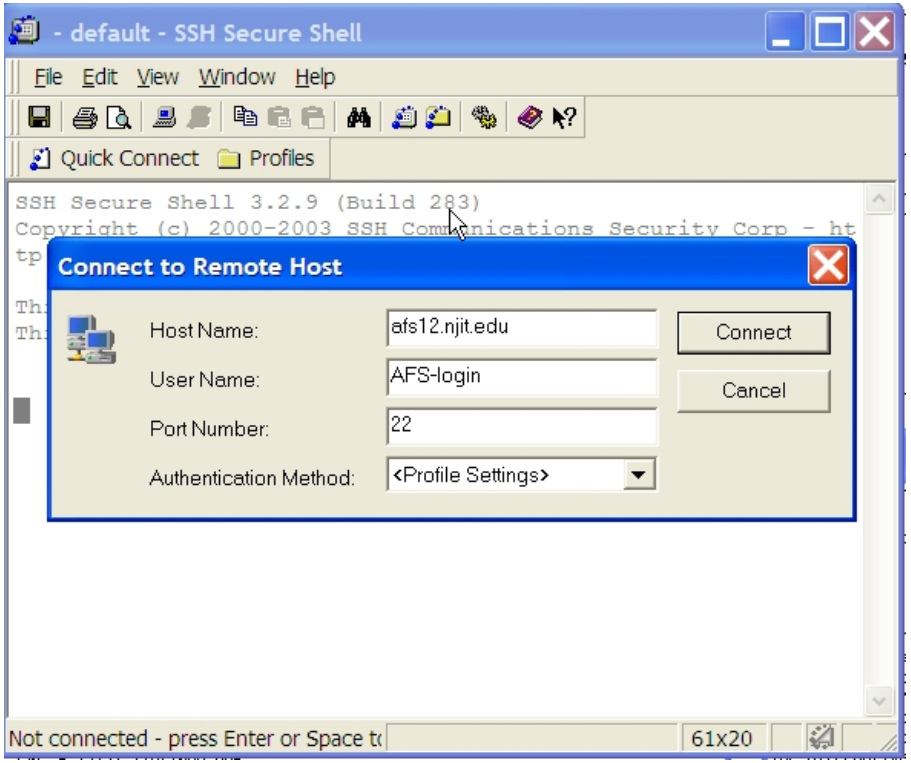


Figure 5: Secure Shell Window and Connect to Remote Host prompt.

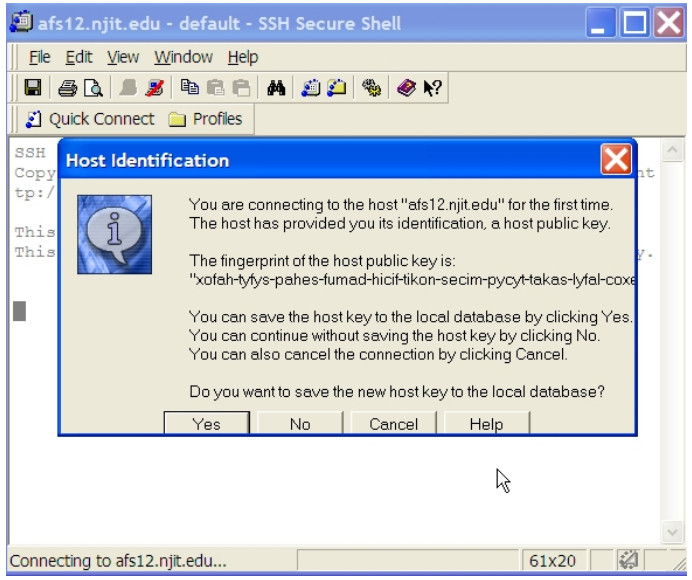


Figure 6: First time window

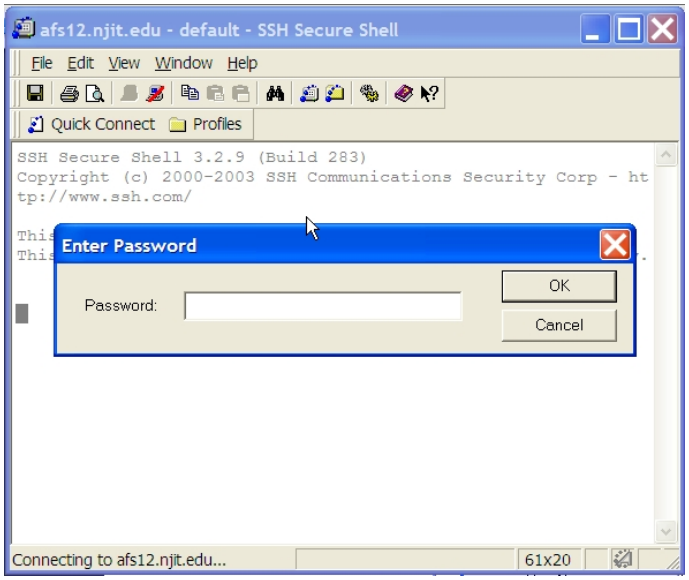


Figure 7: Password Prompt

0.13 Use command-line ssh. If you are already logged on a UNIX machine such as an Apple OS/X desktop or laptop, it is very likely that you will use a command-line version of ssh (secure shell) that does not involve the graphical interface of Figure 5. In such a case something close to Figure 8 might be involved.

In such a case in the prompt which is the percentage sign %, we type in the invocation on a single line such as

```
ssh osl21.njit.edu -l AFS-login
```

and the password prompt appears in the line immediately after. This is also how you can connect from a MAC OSX after you open a terminal there.

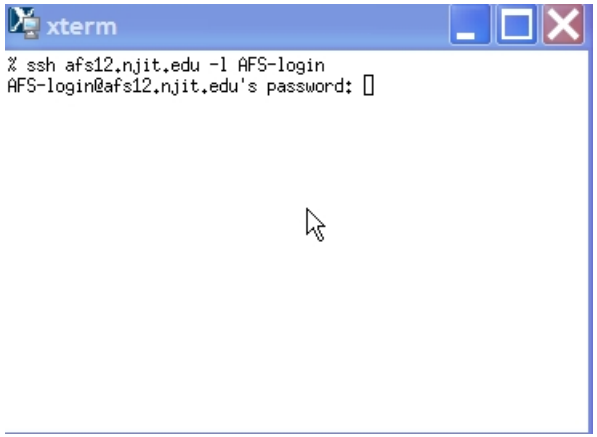


Figure 8: Secure Shell Command-line invocation.

Here the `AFS-login` is typed after `-l` which is the minus symbol (located on the keyboard next to the zero key) followed immediately by the ell letter (the letter after k but before m in the alphabet). Spaces are important where shown; case (lower case vs upper case) is important and all typing is sensitive to it. After pressing the ENTER symbol on the keyboard the Password prompt appears in the following line as shown in Figure 8. You type in the correct `AFS-password` and you then enter `osl21.njit.edu` or whatever other machine you might wish to use instead.

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0.14 We assume that you have connected remotely to an AFS or OSL machine (say osl21.njit.edu or osl12.njit.edu) using either the graphical version of secure shell (Figures 5- 7) or the command-line version (Figure 8).

We are not going to tell you how to start MATLAB using the local (Windows) version stored in your Windows machine. An icon on the Desktop might be available (called shortcut) or you might have to click on the `Start` top-left-corner button and then on the `All Programs` option, and finally select `MATLAB` from the list that follows.

Command-line invocation. If you are already in `osl21.njit.edu` either through step **0.12** or step **0.13** you can startup the local (AFS version) of MATLAB as follows by just typing in `matlab` in lower-case and then pressing ENTER.

(From now on every time we type in a command, we will assume that we press ENTER at the end, and thus avoid writing "and then pressing ENTER".)

MATLAB gives you the option of running multiple (three or more versions). Choose the last option (and in my case this is option 4), by typing 4 that for us corresponds to `MATLAB 7.0 R14.3`.

STOP MATLAB SELECTION: CONTROL-C. If you want to quit the MATLAB version selection process, press `ctrl-C`. This is done by pressing the Control key `Ctrl` and while pressing that key also pressing the `C` key as well. After you had typed 4, MATLAB would take some time to load itself (half a minute to a minute). As soon as you get the `>>` MATLAB prompt which is two 'greater than' symbols `>` one after the other, you can start using MATLAB. If you want to quit from MATLAB then, (after you get the MATLAB command prompt), you have the option of a graceful exit by typing in `quit`.

ATTENTION. The possible options for versions of MATLAB change from time to time. In some environments, you might be offered only 2 options instead of 4. Note that the word `depecated`, is a typo for `deprecated`. These two (deprecated) options are by now obsolete anyway. My rule of thumb is to always choose the last option!

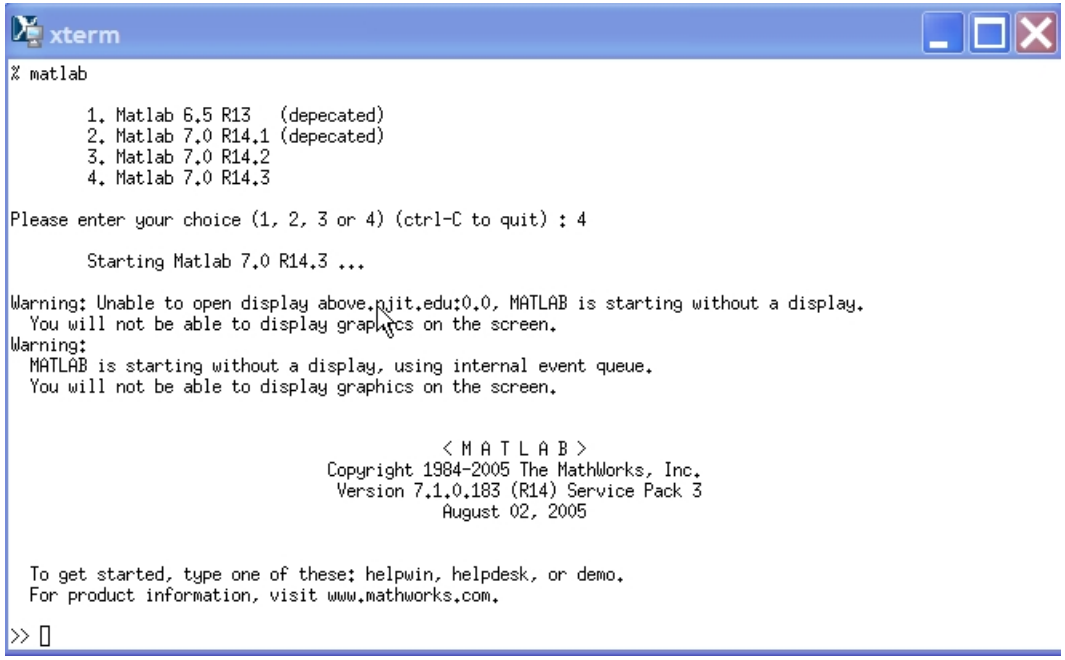


Figure 9: Text-based MATLAB invocation.

Alert! If something looks wrong, or MATLAB does not work properly check step 0.5. Is the NumLock or CapsLock light on? Switch them off, get out of MATLAB (quit) and restart MATLAB by repeating step **0.14**.

0.15 You can logon an AFS machine directly through steps **0.6 - 0.8** if you are in the Lab. Or you connect to AFS remotely through steps 0.12 or 0.13. In either case after login on the AFS machine you repeat the startup procedure of step **0.14** but instead of the MATLAB command line prompt >> you get the graphical MATLAB interface shown in Figure 10. The screen is split 1/3-2/3, with the right portion of the screen occupied by the **Command Window** similar to the one we obtained with the text-based invocation. The left portion of the screen is split into two subwindows. The top one shows the current directory (from which the invocation was issued) and the bottom-left windows shows a command history of the commands issued in the command window.

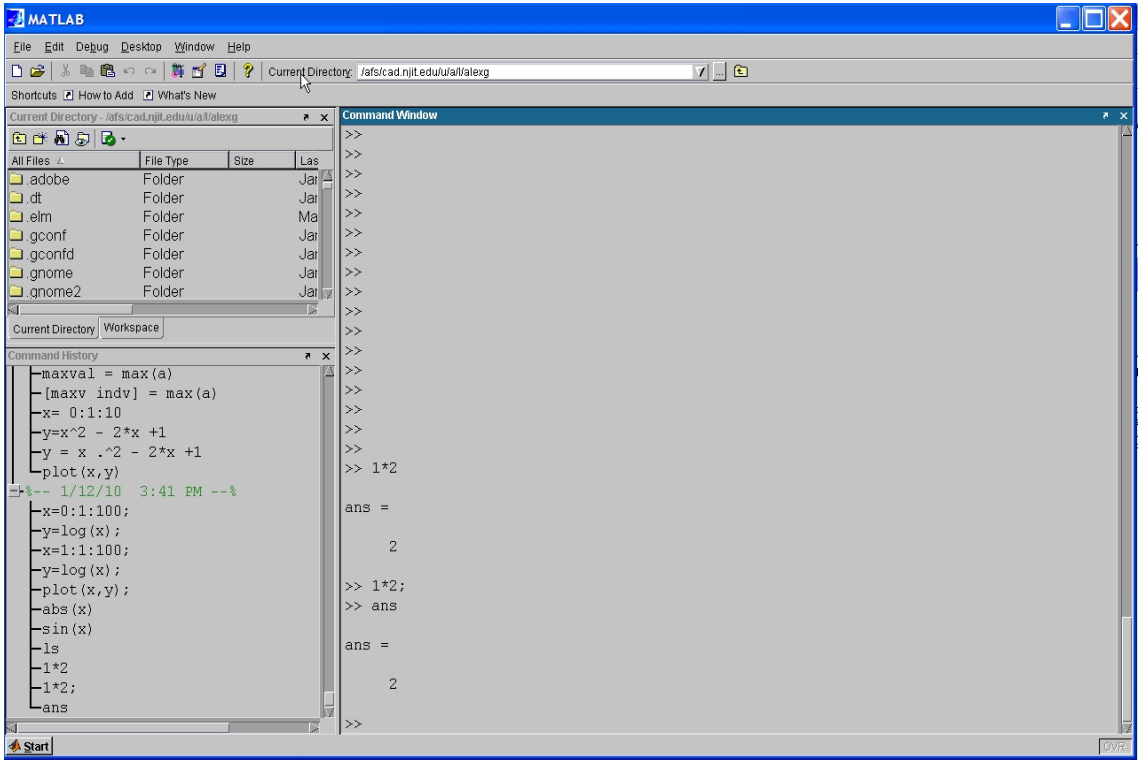


Figure 10: Graphical MATLAB invocation.

1. If you cannot login to a Lab machine or you login and then you are logged out, or cannot do useful work, it means you have reached your disk quota (or in plain English you viewed too many movies or Firefox used up too much of the disk space allocated to you). You might also be getting strange messages such as `Call to Inusertemp failed Check your installation` or `Could not update ICEauthority` .

2. To periodically clean up the disk and avoid this problem do the followin. Open a terminal window: go to Application on the top left corner, click it and pick second option for a Terminal Window of any color choice. You then get the command prompt which is a percent sign. The do one of the following.

2a. **Check quota with fslq.** Type in the following command in a terminal (excluding the percent sign). Note that there is a space between the tilde and the q of fslq. This gives you information about your system quota (how much space you have.

```
% fslq ~
```

2b. **clean.home or purge.cache.** Clean up your disk. It cleans up the cache of the Firefox browser.

```
% purge.cache
```

or

```
% clean.home
```

3. You login and you get something like the following. It means your UCID password has expired. Change it/reset it.

```
% ls
#UCS            afs             devices         lib             opt             tmp
AFS_PATCH_LEVEL awk             etc             lost+found      platform        usr
LAB             bin             export          mnt             proc            var
SOLARIS         core            home            net             root            vol
admin           dev             kernel          nohup.out       sbin            xfn
```

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1. To avoid screensaver issue (or power saving problems).

```
On GNOME
 System --> Preferences ---> ScreenSaver

      Regard the computer as idle after 2hours (maximum)
      Uncheck Activate screensaver when computer is idle

 System --> Preferences ---> PowerManagement
                                                  Action
      Put computer to sleep when inactive for     NEVER
      Put display  to sleep when inactive for     NEVER
```

2. To logoff another student's screensaver, press the following three keys.

```
CTRL - ALT - BACKSPACE
```

3. The link `http://web.njit.edu/info/linux.classrooms/` contains useful information as well.

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