

Creating Programs on UNIX

This term you can create programs on UNIX or you can create programs using a C++ compiler on your PC.

This set of slides steps you through how to create a program on UNIX.

At least two programs this term will be implemented on unix.

Odin account

- First you need an odin account
- You can get one by going to Smith 18
- Or, you can get one by going to:
 - www.account.pdx.edu
- For help you can go email
 - help@pdx.edu
- Or go to: www.oit.pdx.edu

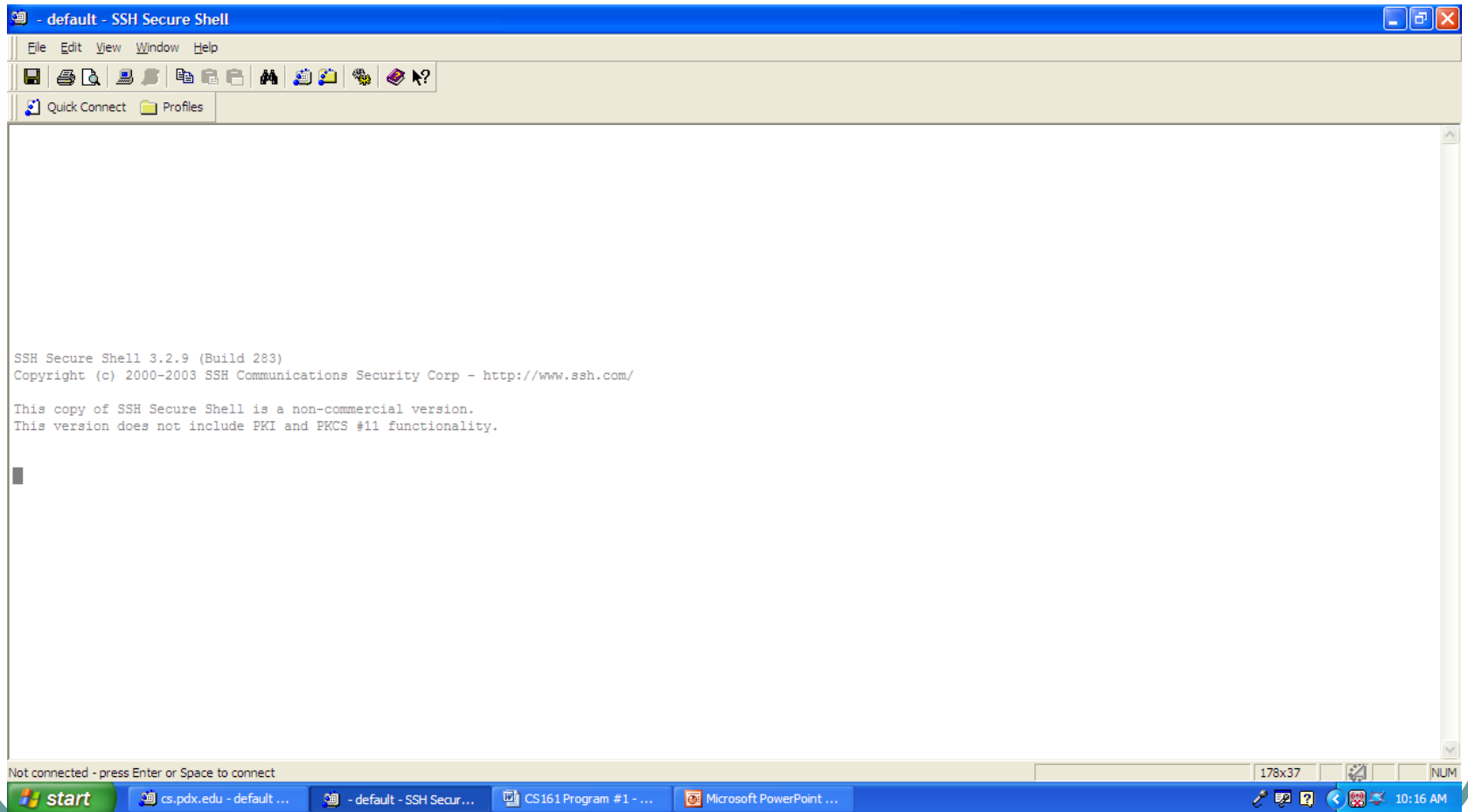
Download ssh or putty

- In order to have your PC or Mac act like a remote terminal for our computers on campus, you will need to download ssh or putty (for free...don't select a site that requires you to pay!)
- <http://www.uss.pdx.edu/software>
- For a tutorial you can go to:
- <http://www.cat.pdx.edu/unix/connecting-to-unix-from-windows-2.html>
- If you can't remember that just go to www.cat.pdx.edu and search on ssh

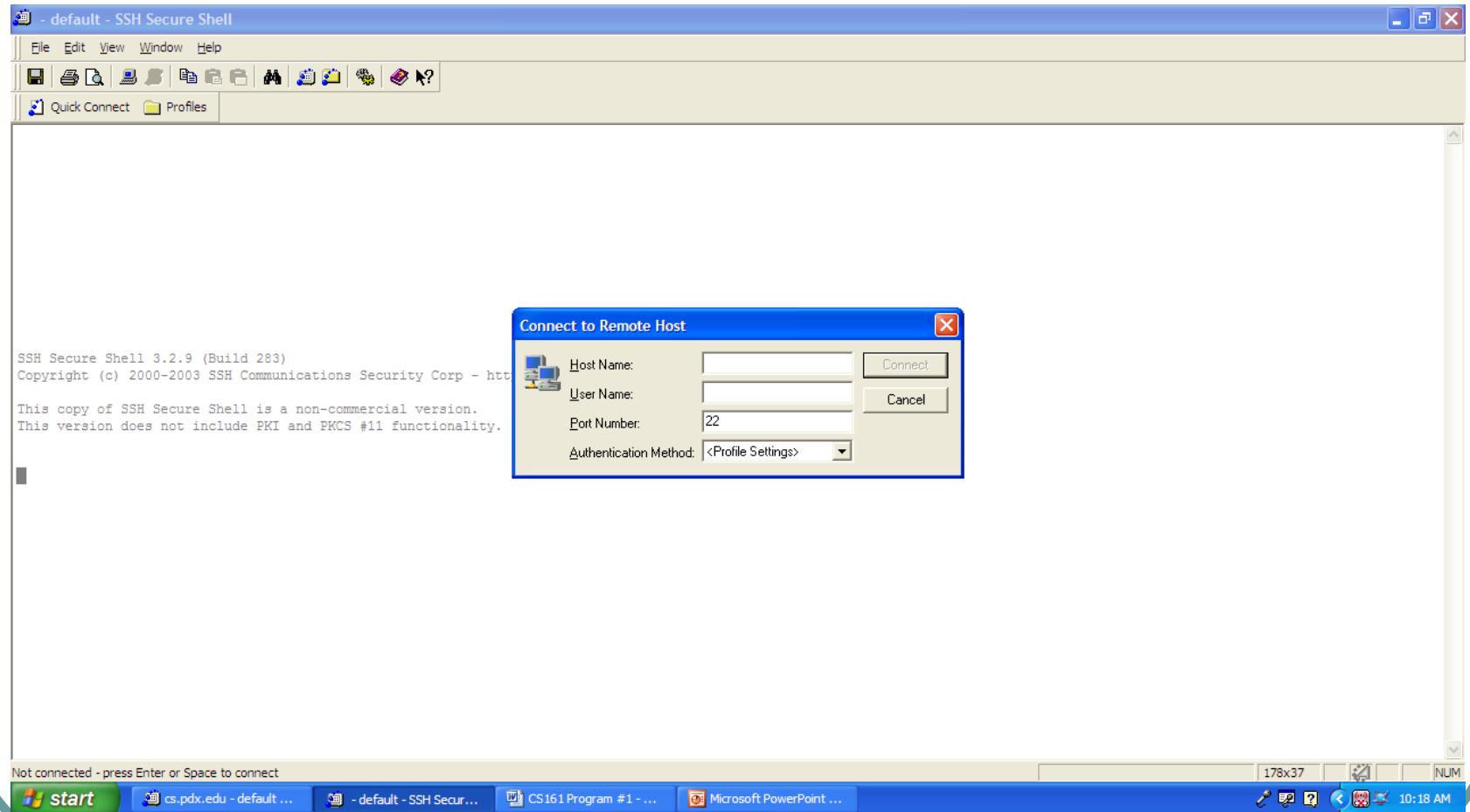
Logging into Odin with ssh

- OK, so once you have downloaded ssh or putty, you can begin to use it to login to the school computers
- Of course, this assume you have an internet connection.
- Double click on the ssh, or putty, application

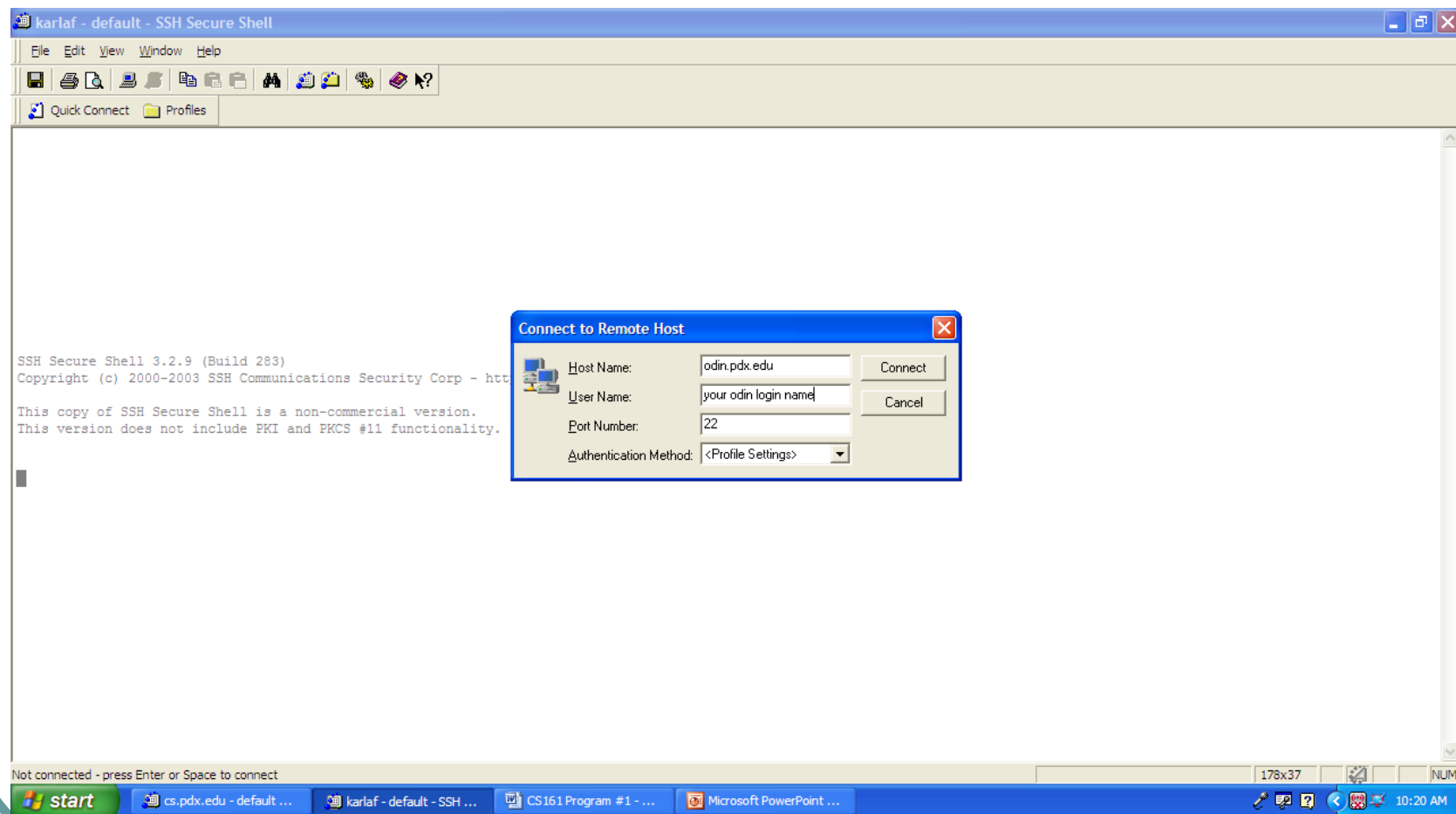
Double Click on SSH



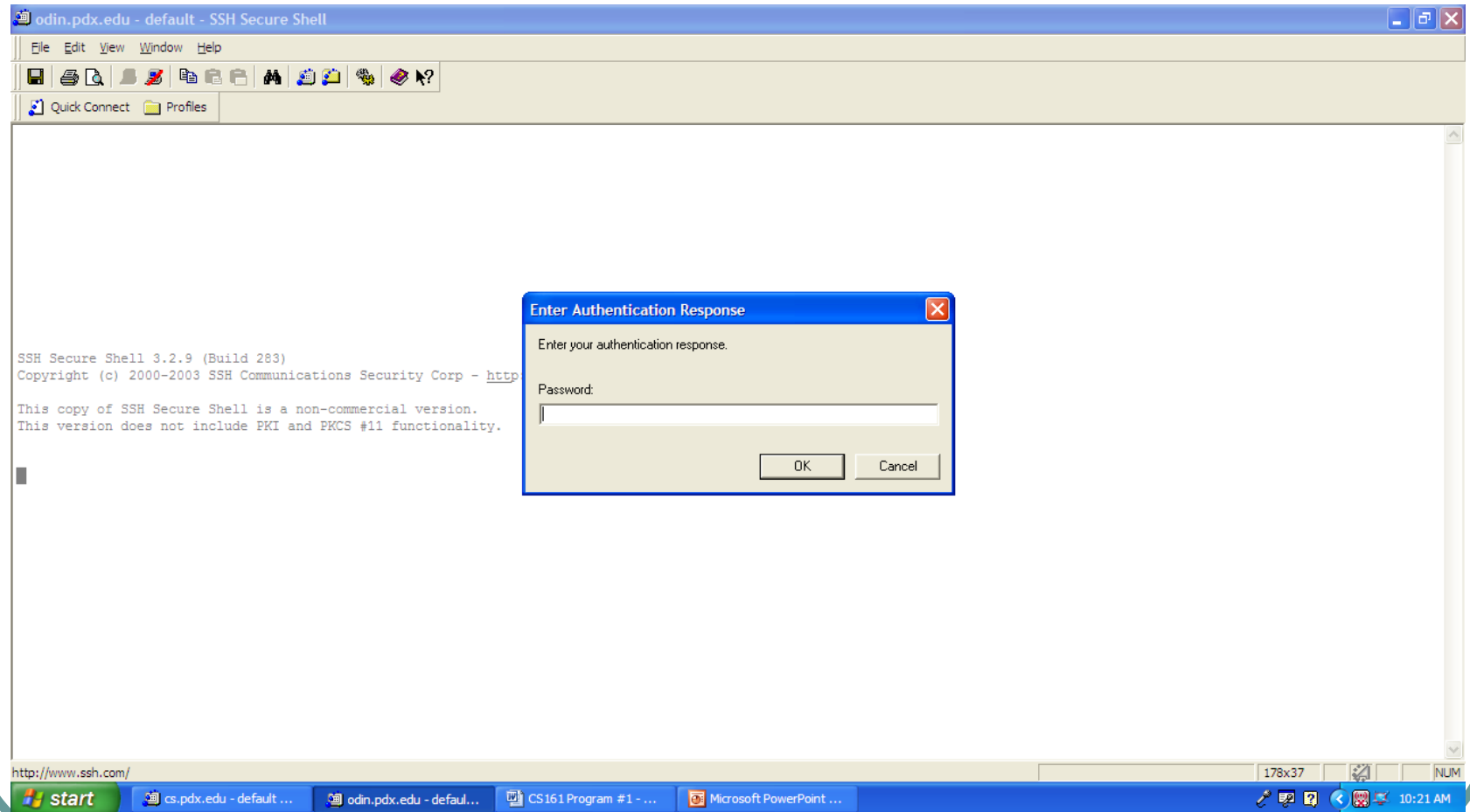
Now, login by hitting enter



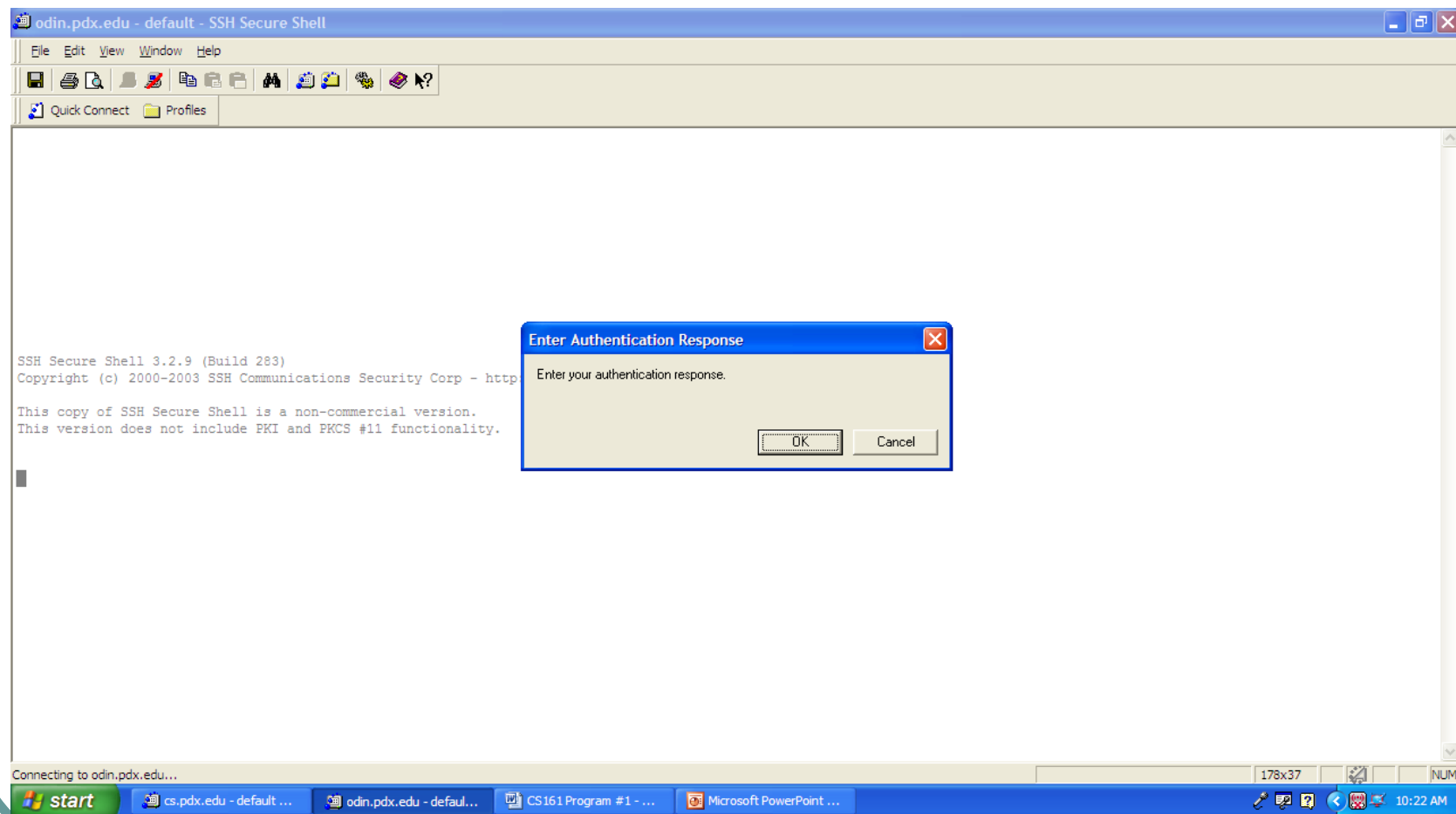
Enter in odin.pdx.edu and login name, then click on “connect”



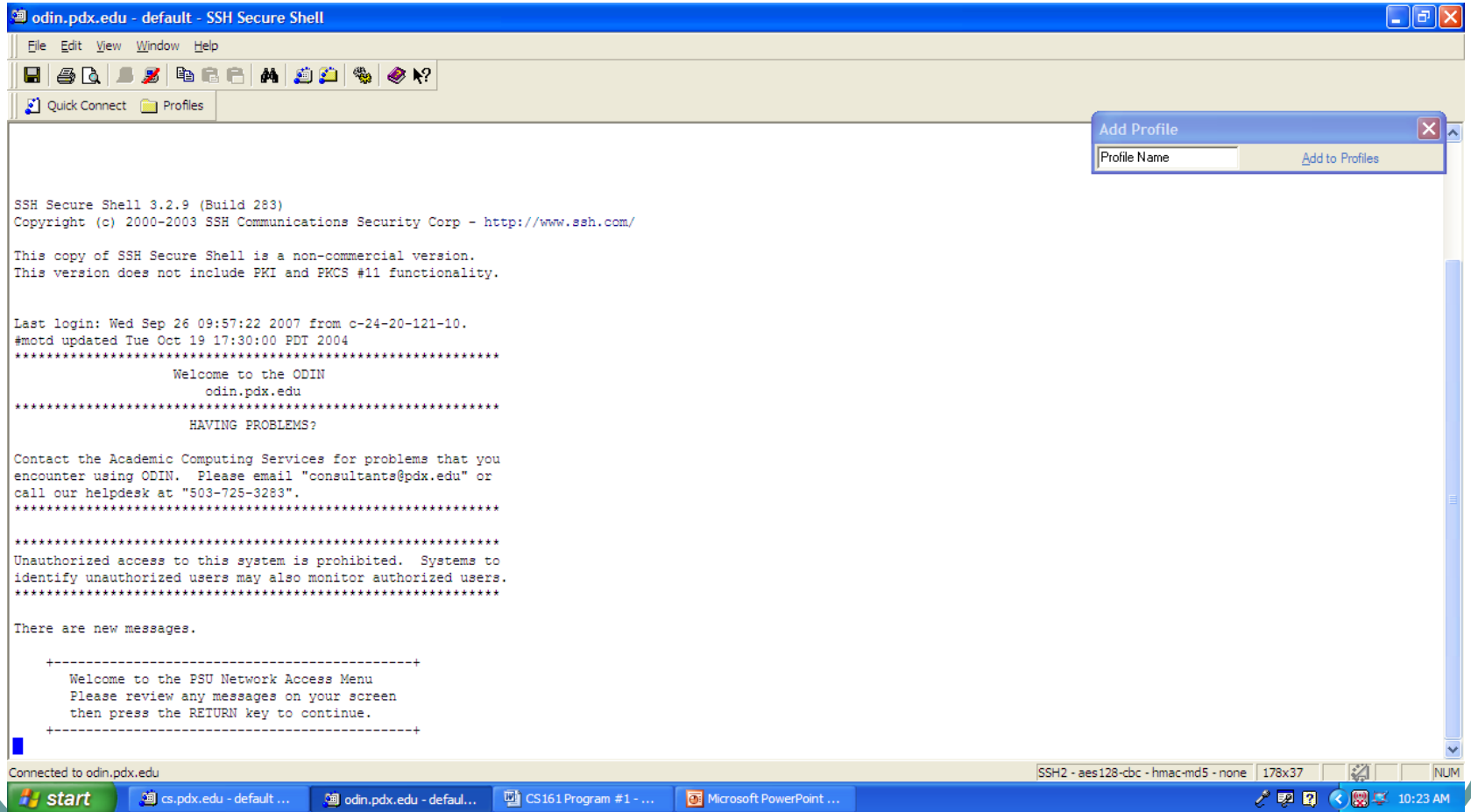
Now...time for your password



Now, Just hit “ok” one more time



Finally, we are on odin!!!!



```
odin.pdx.edu - default - SSH Secure Shell
File Edit View Window Help
Quick Connect Profiles

SSH Secure Shell 3.2.9 (Build 283)
Copyright (c) 2000-2003 SSH Communications Security Corp - http://www.ssh.com/

This copy of SSH Secure Shell is a non-commercial version.
This version does not include PKI and PKCS #11 functionality.

Last login: Wed Sep 26 09:57:22 2007 from c-24-20-121-10.
#motd updated Tue Oct 19 17:30:00 PDT 2004
*****
                Welcome to the ODIN
                odin.pdx.edu
*****
                HAVING PROBLEMS?

Contact the Academic Computing Services for problems that you
encounter using ODIN. Please email "consultants@pdx.edu" or
call our helpdesk at "503-725-3283".
*****

*****
Unauthorized access to this system is prohibited. Systems to
identify unauthorized users may also monitor authorized users.
*****

There are new messages.

+-----+
| Welcome to the PSU Network Access Menu |
| Please review any messages on your screen |
| then press the RETURN key to continue. |
+-----+

Connected to odin.pdx.edu
SSH2 - aes128-cbc - hmac-md5 - none 178x37 NUM
```

Windows taskbar: start, cs.pdx.edu - default, odin.pdx.edu - defaul..., CS161 Program #1 - ..., Microsoft PowerPoint ... 10:23 AM

This is what you'll see

- SSH Secure Shell 3.2.9 (Build 283)
- Copyright (c) 2000-2003 SSH Communications Security Corp - <http://www.ssh.com/>

- This copy of SSH Secure Shell is a non-commercial version.
- This version does not include PKI and PKCS #11 functionality.

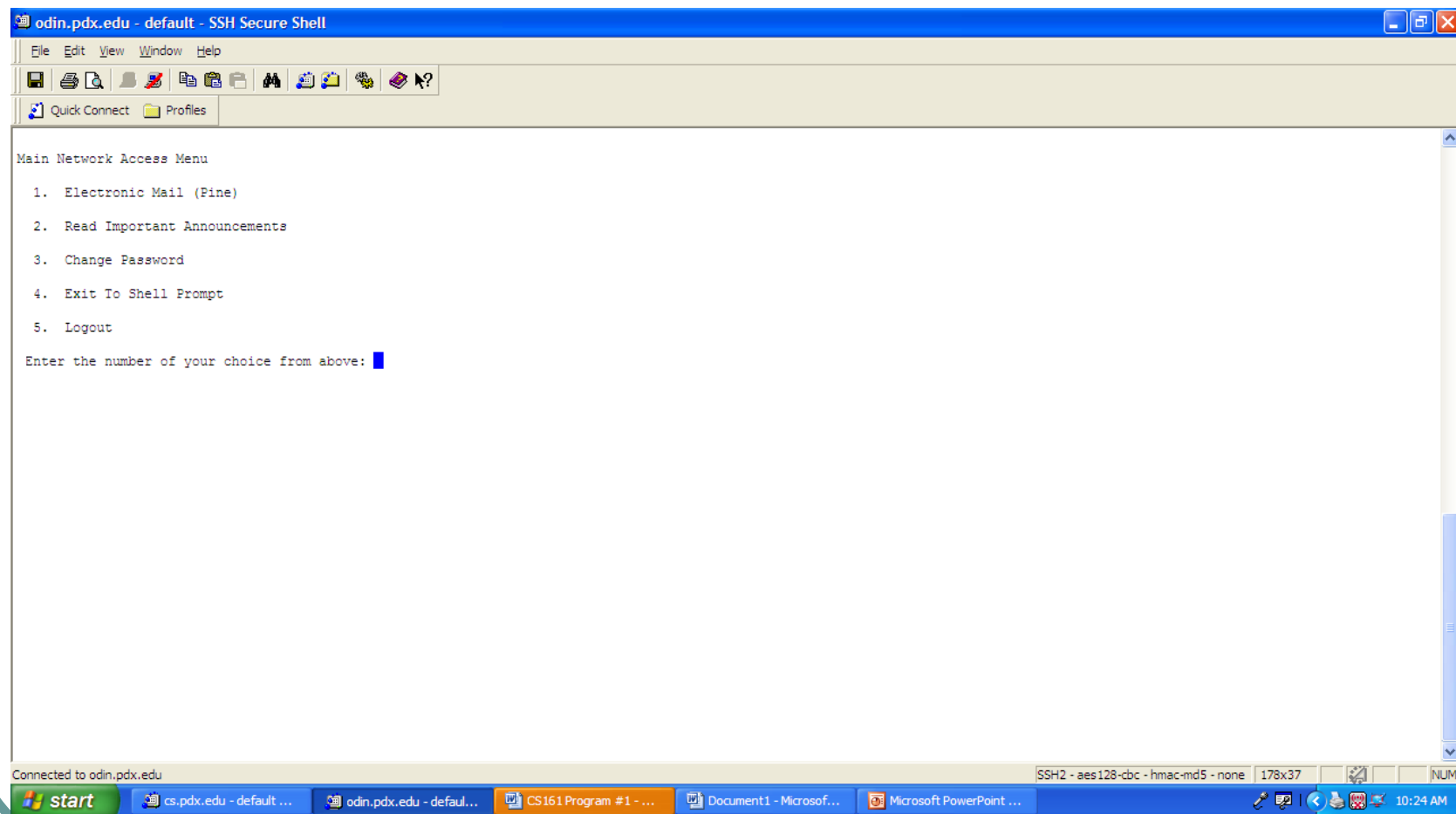
- Last login: Wed Sep 26 10:33:37 2007 from c-24-20-121-10.
- #motd updated Tue Oct 19 17:30:00 PDT 2004
- *****
- Welcome to the ODIN
- odin.pdx.edu
- *****
- HAVING PROBLEMS?

- Contact the Academic Computing Services for problems that you
- encounter using ODIN. Please email "consultants@pdx.edu" or
- call our helpdesk at "503-725-3283".
- *****

- *****
- Unauthorized access to this system is prohibited. Systems to
- identify unauthorized users may also monitor authorized users.
- *****

- There are new messages.
-
- +-----+
- Welcome to the PSU Network Access Menu
- Please review any messages on your screen
- then press the RETURN key to continue.
- +-----+

Hit return....you'll see a menu



We want to exit this menu...

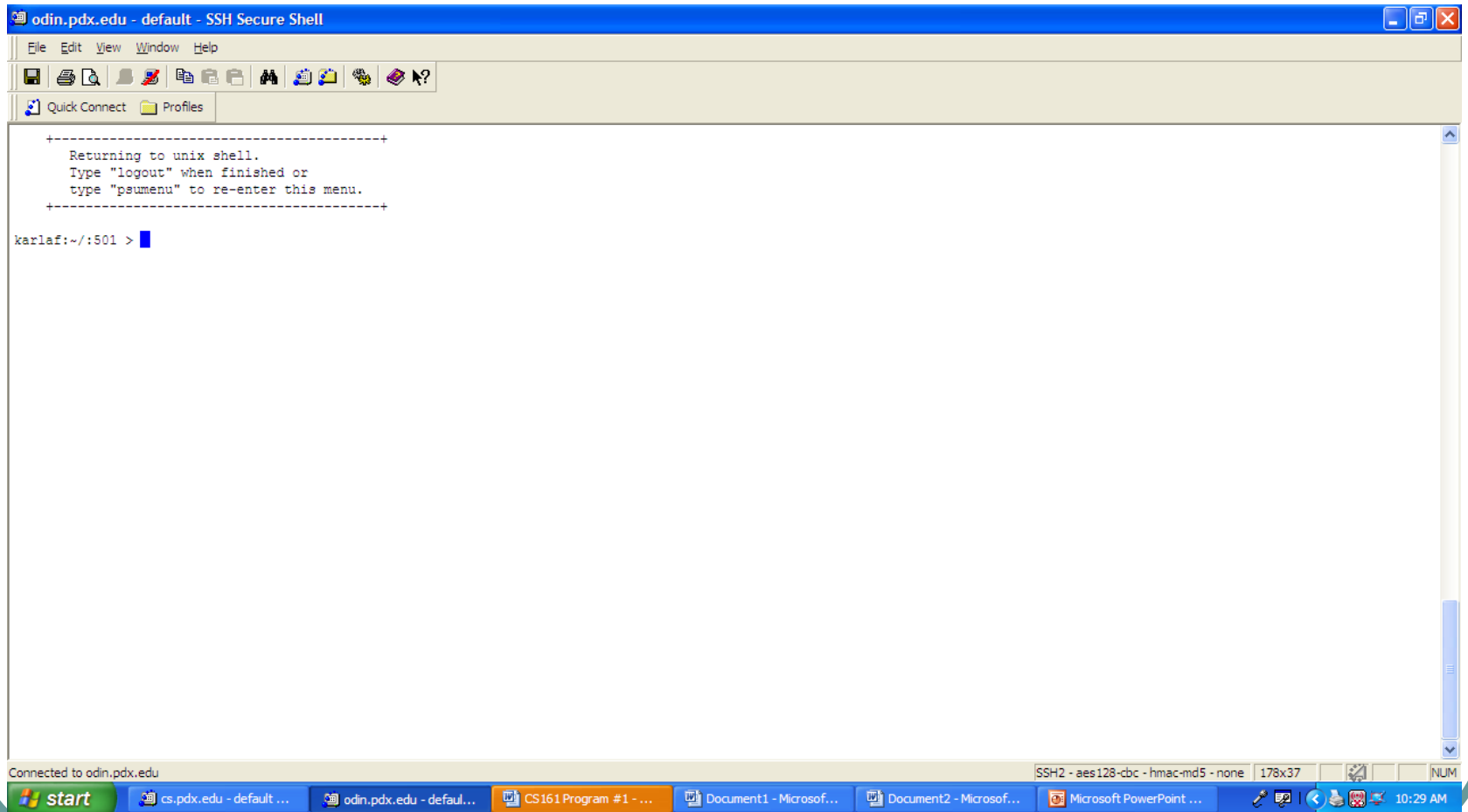
- So, type 4 followed by hitting the enter key

Main Network Access Menu

1. Electronic Mail (Pine)
2. Read Important Announcements
3. Change Password
4. Exit To Shell Prompt
5. Logout

Enter the number of your choice from above: 4

We are now at the UNIX prompt



The image shows a screenshot of a Windows desktop with an SSH terminal window open. The window title is "odin.pdx.edu - default - SSH Secure Shell". The terminal content is as follows:

```
-----+
Returning to unix shell.
Type "logout" when finished or
type "psmenu" to re-enter this menu.
-----+

karlaf:~/:501 > █
```

The terminal window has a menu bar with "File", "Edit", "View", "Window", and "Help". Below the menu bar is a toolbar with various icons. At the bottom of the terminal window, it says "Connected to odin.pdx.edu". The Windows taskbar at the bottom shows the Start button, several open applications (including "cs.pdx.edu - default ...", "odin.pdx.edu - defaul...", "CS161 Program #1 - ...", "Document1 - Microsof...", "Document2 - Microsof...", and "Microsoft PowerPoint ..."), and the system tray with the time "10:29 AM".

This is what that looks like close up

+-----+

Returning to unix shell.

Type "logout" when finished or
type "psumenu" to re-enter this menu.

+-----+

```
karlaf:~/:501 > mkdir cs161
```

```
karlaf:~/:502 >
```

For the first time you login...

- The first time you login, you'll want to create a cs161 directory where you will be doing all of your homework for this course.
- Type at the unix prompt: `mkdir cs161`
- Follow this by hitting the enter key
- Make sure to enter everything lower case
- And, once this is created, you won't need to do it again

This is what your screen looks like

+-----+

Returning to unix shell.

Type "logout" when finished or
type "psumenu" to re-enter this menu.

+-----+

```
karlaf:~/:501 > mkdir cs161
```

```
karlaf:~/:502 >
```

Now, change into that directory

- **Now**, to enter that directory to start to work type: **cd cs161**
- Follow this by hitting the enter key
- “No news” is “good news” in unix!
- Your prompt on odin will look different than my prompt...

This is what my screen shows

+-----+

Returning to unix shell.

Type "logout" when finished or
type "psumenu" to re-enter this menu.

+-----+

```
karlaf:~/:501 > mkdir cs161
```

```
karlaf:~/:502 > cd cs161
```

```
karlaf:~/cs161/:503 >
```

OK, now let's start programming

- Now you are ready to start typing in your first program (which is pass/no pass).
- Use pico to type in a program. So, type at the unix prompt:
- **pico prog1.cpp**
- **Follow this by hitting the enter key**

OK, so before I hit enter it looks like this

+-----+

Returning to unix shell.

Type "logout" when finished or
type "psumenu" to re-enter this menu.

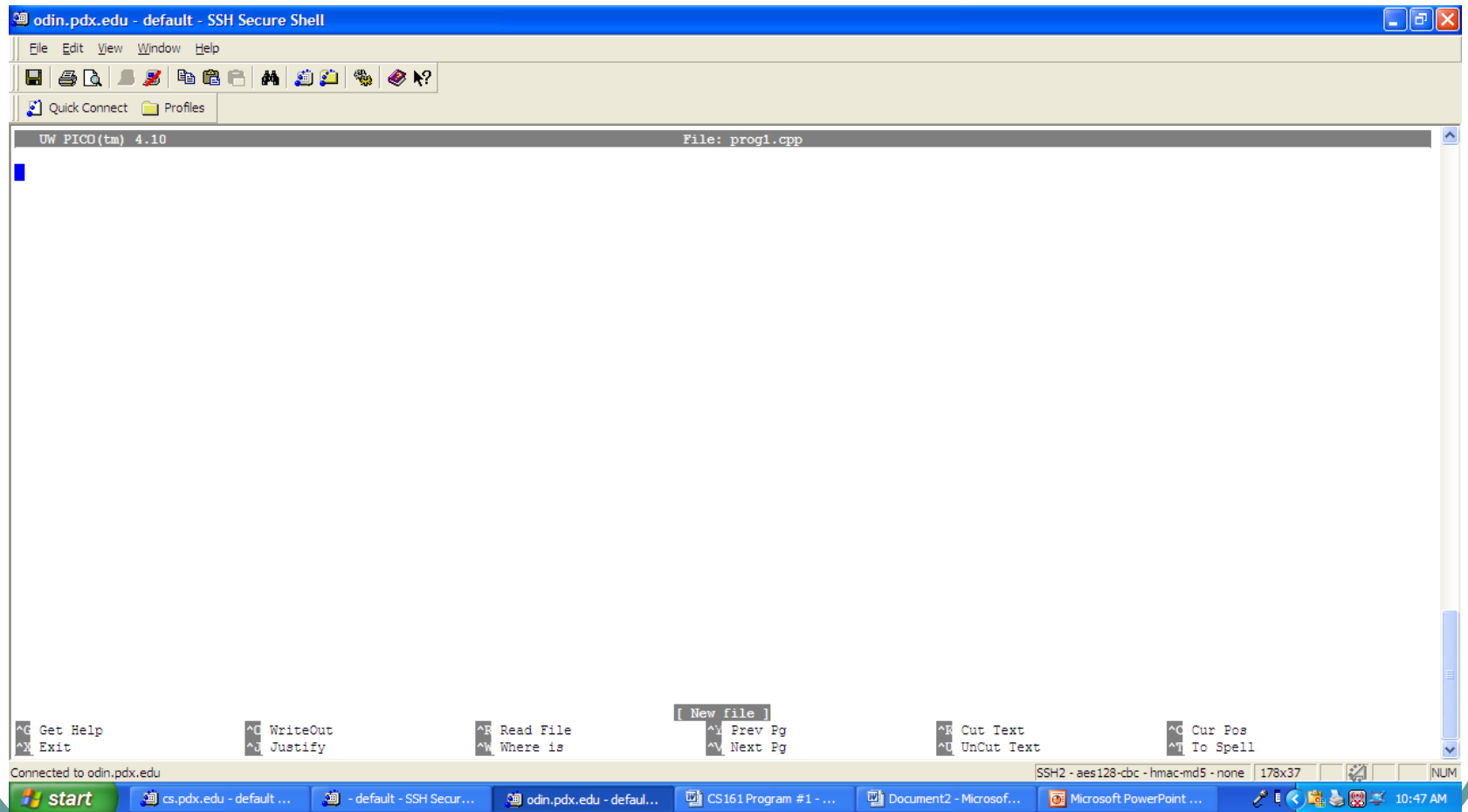
+-----+

```
karlaf:~/:501 > mkdir cs161
```

```
karlaf:~/:502 > cd cs161
```

```
karlaf:~/cs161/:503 > pico prog1.cpp
```

After hitting enter, we are in the pico editor



Pico Commands

- Luckily, the pico commands are listed at the bottom of your window
- The ^ means to hit the control key
 - control x means to exit
 - control o means to save your work
 - control r means to read in a file
 - control v means to go to the next page
- I mostly use the first two

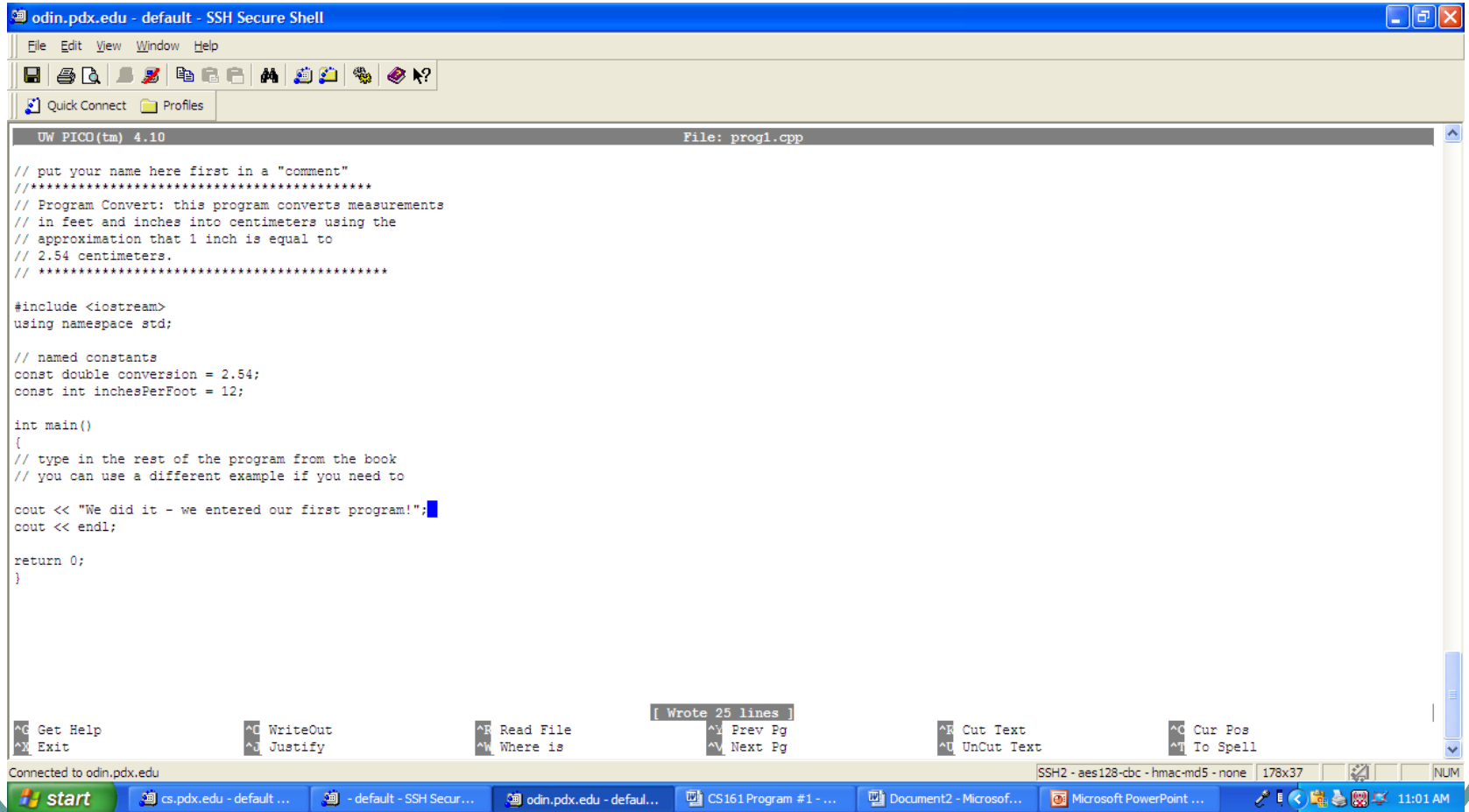
You are ready to type a program

1. **Enter in the program** from the Malik book - at the end of Chapter 2 titled "Complete Program Listing" immediately before the "Quick Review".
2. Enter the entire program – including comments! If you are looking for something a little more exciting, you can pick the program at the end of Chapter 5 instead.
3. Make sure to also add your name!

So, Just start typing!

- With pico, you can just start typing.
- You can use the arrow keys
- You can use a different example if you aren't able to get a copy of our book. Just make sure it is a “complete” program

I did part of it....watch for typos!



The screenshot shows a Windows SSH terminal window titled "odin.pdx.edu - default - SSH Secure Shell". The terminal displays the output of the "UW PICO(tm) 4.10" compiler for a file named "prog1.cpp". The code is a C++ program that converts measurements from feet and inches to centimeters. The program includes a comment block, a header file, named constants for conversion and inches per foot, and a main function that prints a message.

```
UW PICO(tm) 4.10                               File: prog1.cpp

// put your name here first in a "comment"
//*****
// Program Convert: this program converts measurements
// in feet and inches into centimeters using the
// approximation that 1 inch is equal to
// 2.54 centimeters.
// *****

#include <iostream>
using namespace std;

// named constants
const double conversion = 2.54;
const int inchesPerFoot = 12;

int main()
{
// type in the rest of the program from the book
// you can use a different example if you need to

cout << "We did it - we entered our first program!";
cout << endl;

return 0;
}

[ Wrote 25 lines ]

^G Get Help      ^C WriteOut     ^R Read File    ^Y Prev Pg     ^K Cut Text     ^C Cur Pos
^X Exit         ^u Justify     ^W Where is    ^V Next Pg     ^U UnCut Text  ^T To Spell

Connected to odin.pdx.edu                        SSH2 - aes128-cbc - hmac-md5 - none 178x37 NUM
```

The Windows taskbar at the bottom shows the Start button and several open applications: "odin.pdx.edu - default...", "odin.pdx.edu - default...", "CS161 Program #1 - ...", "Document2 - Microsof...", and "Microsoft PowerPoint ...". The system clock shows "11:01 AM".

OK, make sure to save it!

- Type control o to save your file
 - It will ask you if you really want to save it still as prog1.cpp
 - Just hit enter (you DO want to save it as prog1.cpp)
- If it takes you awhile to type in the program, I would save it periodically...
- Type control x to exit pico

Back at the unix prompt

- Now we are back to the unix prompt
- It is time to “compile” your program to see if it works!
- **Compile** your C++ source code file.
The command to do this is:
- **g++ prog1.cpp**
- **Follow this by hitting the enter key**

Using the compiler

- Again, with unix “no news” is “good news”
karlaf:~/cs161/:510 > g++ prog1.cpp
karlaf:~/cs161/:511 >
- But, let’s say I forgot a semicolon after the return 0;
karlaf:~/cs161/:510 > g++ prog1.cpp
prog1.cpp: In function 'int main()':
prog1.cpp:25: error: expected ';' before '}' token
karlaf:~/cs161/:511 >

So, get back into the editor

- Start up pico again and use the arrow keys to move around and modify your program
- Save your changes and then exit pico again...

```
karlaf:~/cs161/:510 > g++ prog1.cpp
```

```
prog1.cpp: In function 'int main()':
```

```
prog1.cpp:25: error: expected ';' before '}' token
```

```
karlaf:~/cs161/:511 >
```

```
karlaf:~/cs161/:511 > pico prog1.cpp
```

Back at the unix prompt

- After any corrections, you would get back to the unix prompt
- It is time to “compile” your program to see if it works this time
- **Compile** your C++ source code file. The command to do this is:
- **g++ prog1.cpp**
- **Follow this by hitting the enter key**

Time to run your program

- Once the program successfully compiles, with no error messages, you can run your program by typing:

```
./a.out
```

```
karlaf:~/cs161/:512 > ./a.out
```

We did it - we entered our first program!

```
karlaf:~/cs161/:513 >
```


Double check that it ran ok

- Double check that the program ran as the book describes
- Make any necessary changes (with pico)
- Each time you change your program you need to re-compile with g++
- And, then you can run your program with `./a.out`

Ready to turn it in?

- When you are satisfied with the program
- **MAKE SURE** your name is in the program (in comments)

```
// Beth Miller
```

- At the unix prompt type (all on one line)
mailx -s "My Name - Prog #1 Submission"
karlafgr@cs.pdx.edu <prog1.cpp
- Follow this by hitting the enter key