



# CSCI 2270

## Data Structures & Algorithms

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Lecture 2

Jan 16, 2013

**Computing Environment  
and**

**Intro to Data Structures & Algorithms**

# Lecture Goals

1. Virtual Box
2. Shell Interaction
3. Text/Code Editors
4. Sorting (card game)
5. Linked List (card game)

# Upcoming Homework Assignment

HW #1 **Due: Friday, Jan 25**

## Linked Lists (pointers)

Implement a Linked List Data Structure in C++ that has common manipulation functions, including (but not limited to):

- \* Create a new list
- \* Append/insert data to the list
- \* Remove an item from the list
- \* Determine if the list contains a value
- \* Create a sub-list
- \* Copy a list
- \* Determine if the list is empty

**I will release the 'official' assignment on Friday.**

# Virtual Box

Need help installing? Go to an installation help session in the CSEL Wireless Cafe ([ECCS 128](#)).

Scheduled Sessions are 1 hour each:

**Wed Jan 16 2pm**

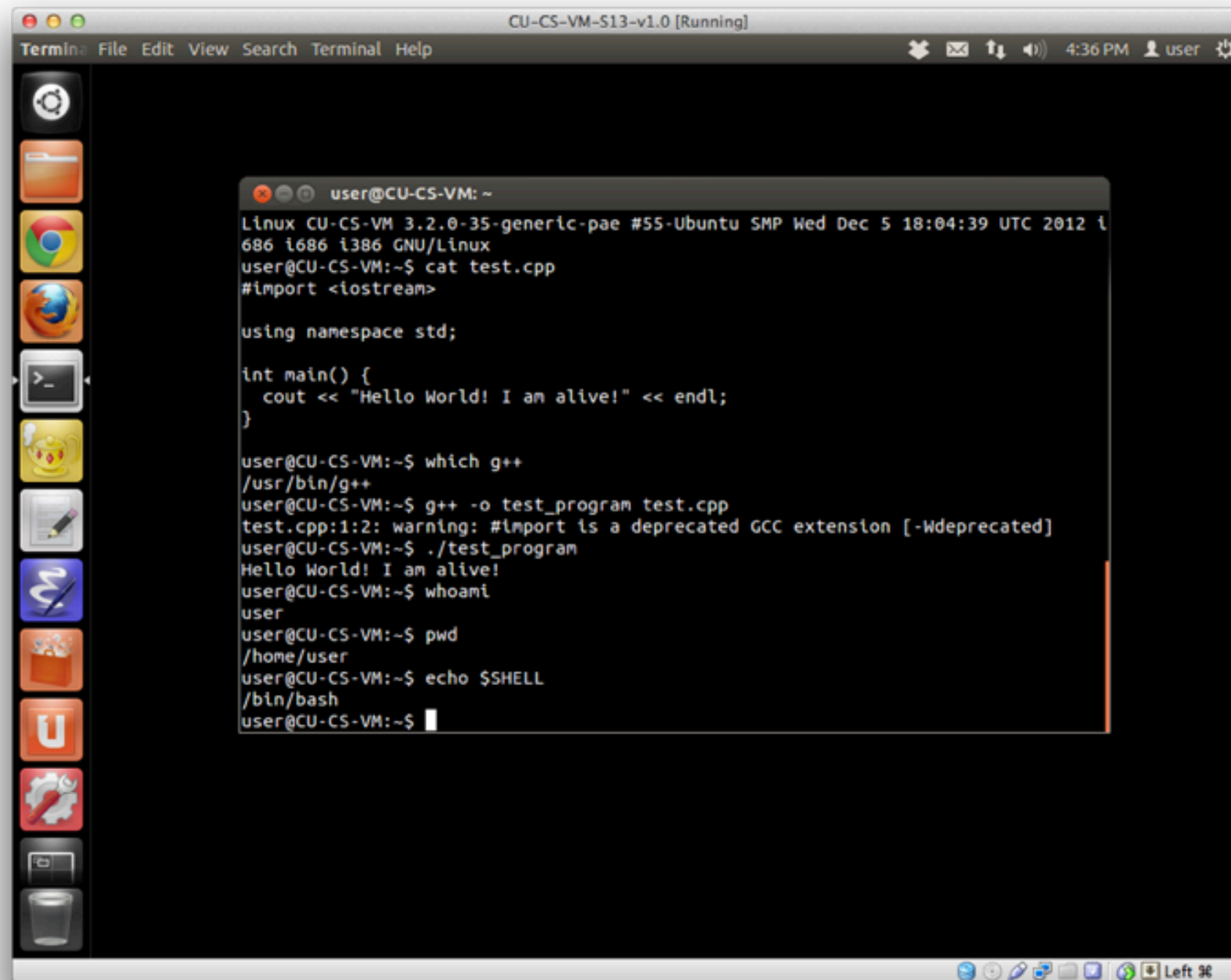
**Fri Jan 18 4pm**

**Wed Jan 23 12pm**

**Wed Jan 23 2pm**

Additional sessions by may be scheduled by appointment. Contact [andrew.sayler@colorado.edu](mailto:andrew.sayler@colorado.edu) for more information.

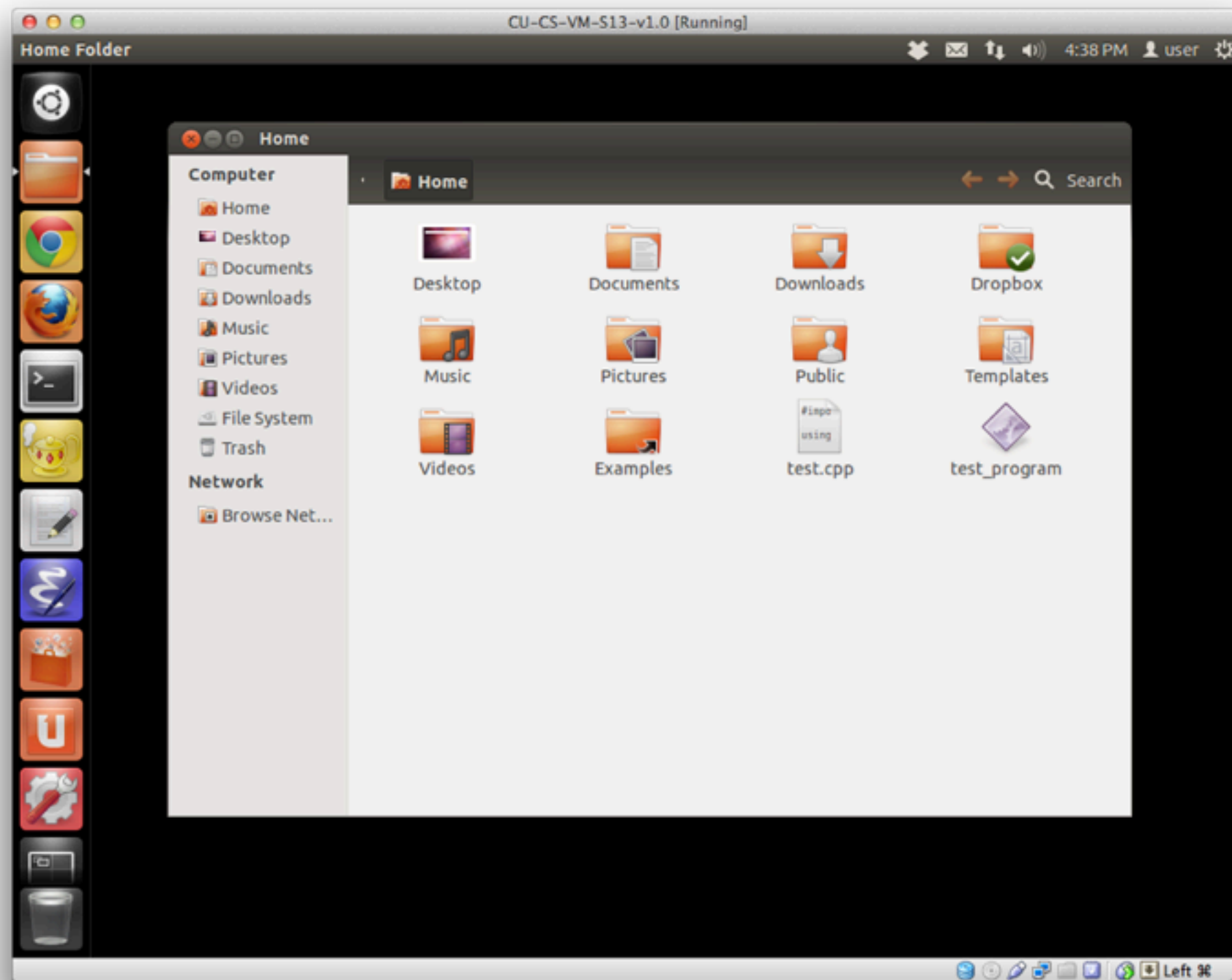
# Shell Interaction



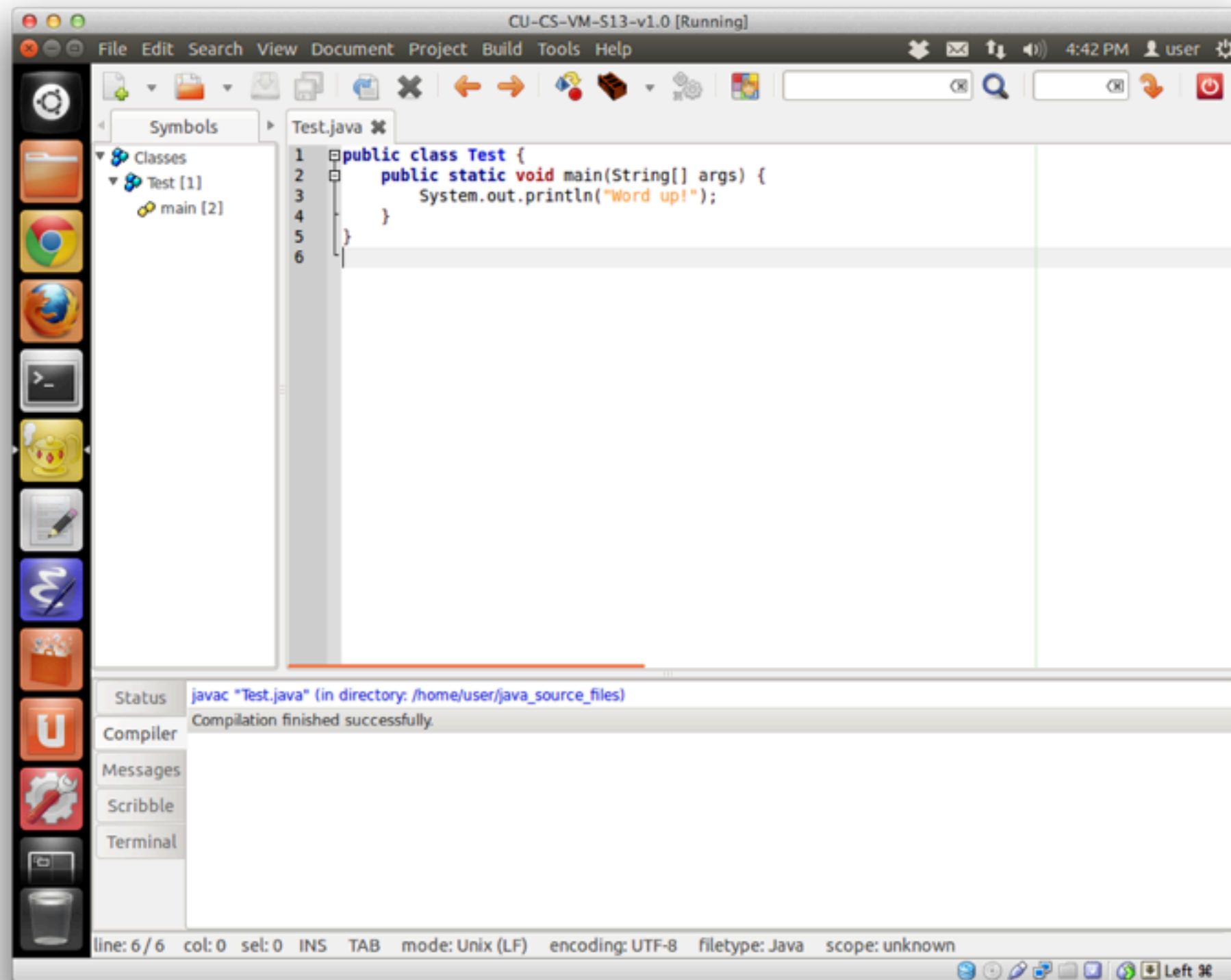
The screenshot shows a terminal window titled "CU-CS-VM-S13-v1.0 [Running]" with a menu bar (Terminal, File, Edit, View, Search, Terminal, Help) and a status bar (4:36 PM, user). A vertical dock on the left contains icons for a terminal, file manager, web browser, Firefox, a terminal icon, a game, a notepad, a music player, a folder, a 'U' logo, a settings gear, a server, and a trash can. The terminal content shows the following sequence of commands and output:

```
user@CU-CS-VM: ~  
Linux CU-CS-VM 3.2.0-35-generic-pae #55-Ubuntu SMP Wed Dec 5 18:04:39 UTC 2012 i  
686 i686 i386 GNU/Linux  
user@CU-CS-VM:~$ cat test.cpp  
#import <iostream>  
  
using namespace std;  
  
int main() {  
    cout << "Hello World! I am alive!" << endl;  
}  
  
user@CU-CS-VM:~$ which g++  
/usr/bin/g++  
user@CU-CS-VM:~$ g++ -o test_program test.cpp  
test.cpp:1:2: warning: #import is a deprecated GCC extension [-Wdeprecated]  
user@CU-CS-VM:~$ ./test_program  
Hello World! I am alive!  
user@CU-CS-VM:~$ whoami  
user  
user@CU-CS-VM:~$ pwd  
/home/user  
user@CU-CS-VM:~$ echo $SHELL  
/bin/bash  
user@CU-CS-VM:~$
```

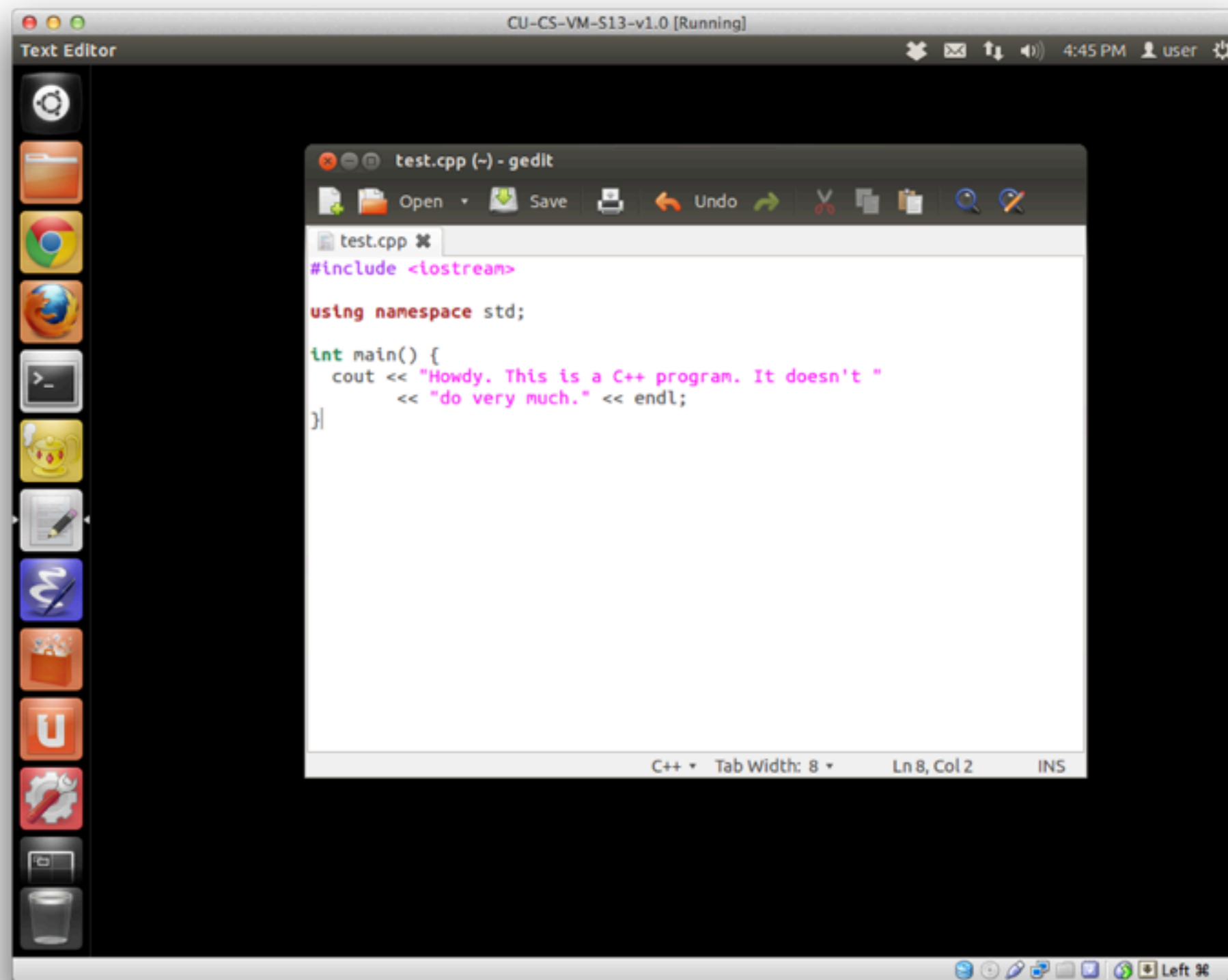
# File Browser (familiar?)



# Text and Code Editors: Geany

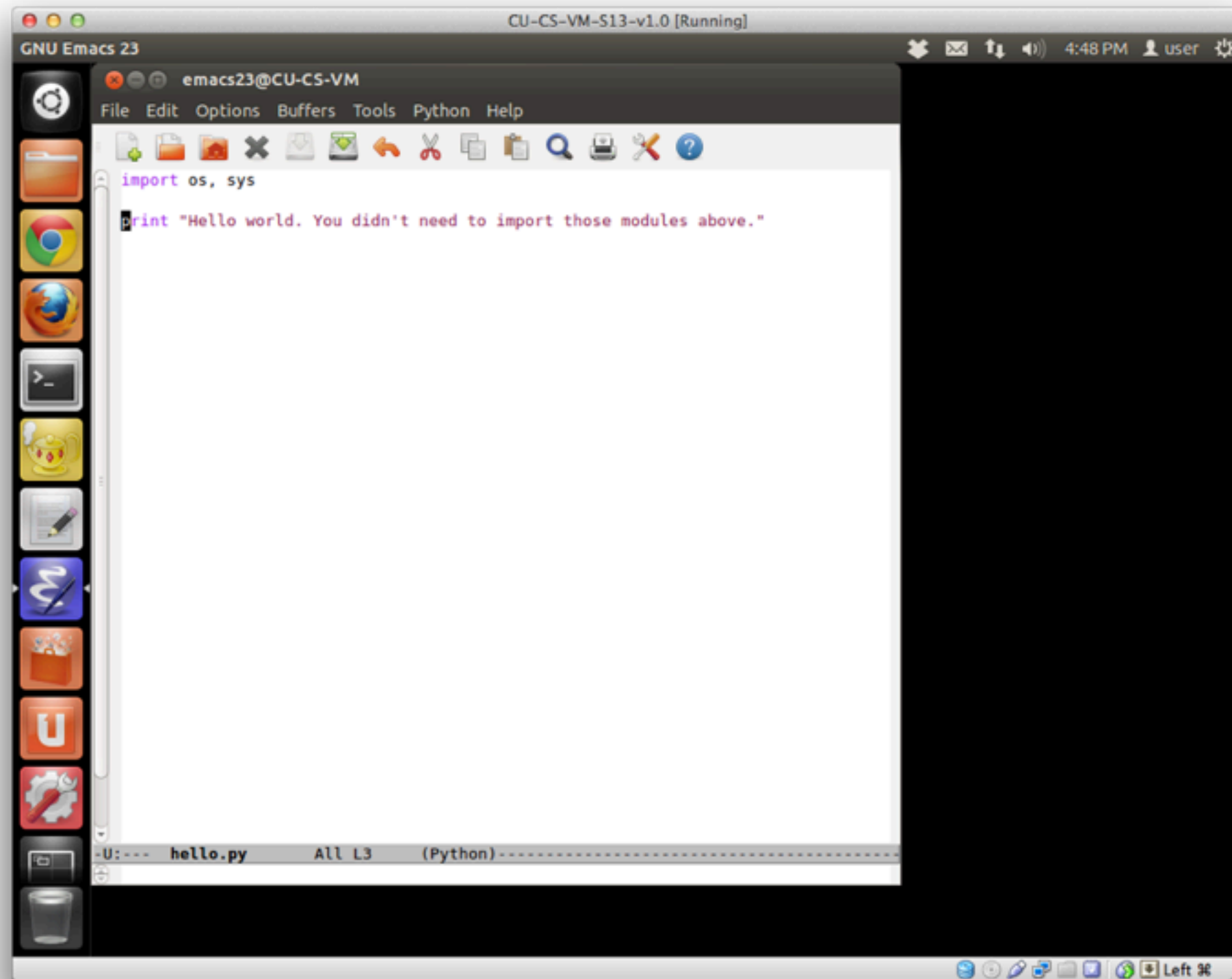


# Text and Code Editors: gedit





# Text and Code Editors: emacs



# Review of Linux+CLI?

If enough people would like a review of the Ubuntu environment I can do a little tour right now...

Otherwise, read as much of ***The Command Line Crash Course*** as you can stand.

(you should be able to do the entire thing in about 5 hours.)

# Sorting Game (Algorithm)

I'll give out a bunch of cards with numbers on them. Each person represents a variable, and the number on their card represents that variable's value.

The idea is to come up with an efficient strategy for sorting people so the numbers increase monotonically.

# Sorting Game (Algorithm)

A second exercise (once the numbers are sorted) is to create a sequence of steps to locate particular numbers in the list, or to determine if the number is not in the list.



**Pointers**

# Linked List Game (DS)

A second bunch of cards! Each has a *memory address*, a *data structure member name*, and a *value*.

We will be able to follow the data structure to determine what exciting phrase the linked list contains.

It will also serve as a starting point for thinking about the kinds of operations we might do on such lists. Or, for that matter, any kind of collection data structure.

# For Next Time

Read sections 1, 1.1, and 1.2 in the Shaffer text.

Read section on pointers in *C++ Language Tutorial* at <http://www.cplusplus.com/doc/tutorial/pointers/>

We'll start coding next time. If you are awesome you might get some coding in beforehand.