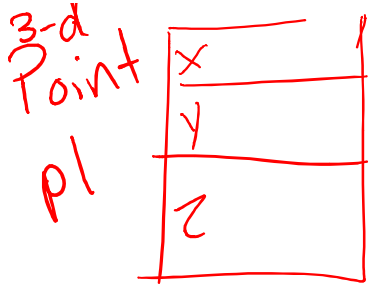
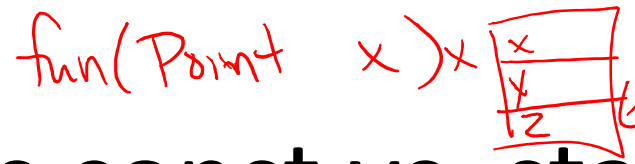
# CS 162
# Intro to CS II

More Classes [redacted]




revisit

# What is const vs. static?

we've seen before to make a global constant

- What is const?
  - const int x; //cannot have as member var
  - void function(const int &x) { … }
  - void function() const { … }
  - When would we want to make a member function const? When wouldn't we?
- What is static?
  - Class variable or function
  - static int x; …. Point::x
- Can have a **static const int x=0;**

save memory!!!! vs. #define

all accessor can't change member variable

function can't change argument instead of passing by value

public

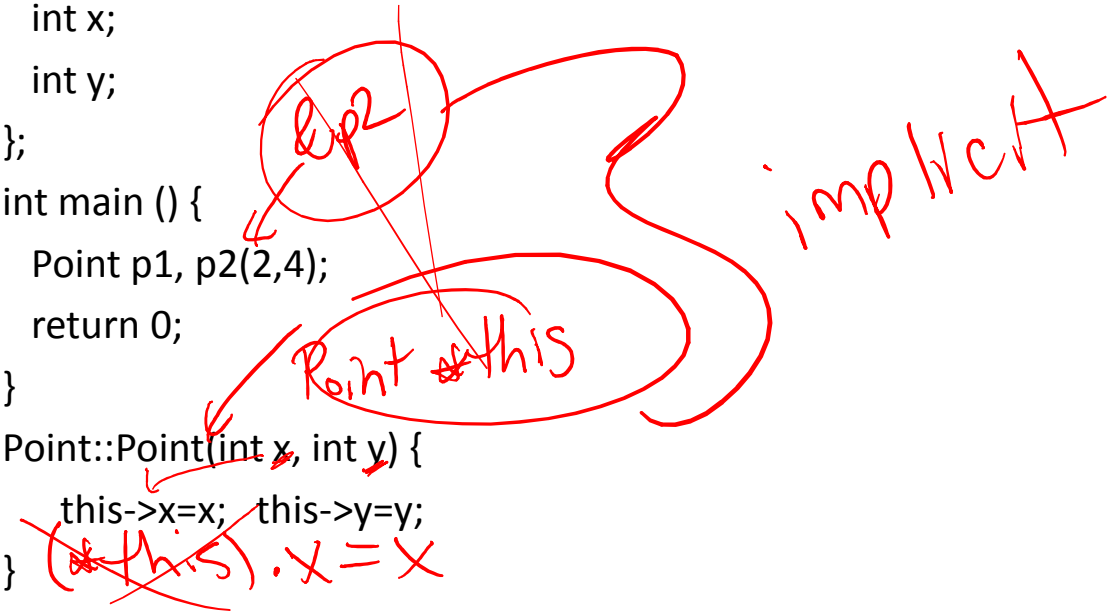
where to find

Point p, p1;

Math::PI

# This Pointer…

```
class Point t
public:
   Point();
   Point(int x, int y);   //Constructor
   void set_xy(int theX, int theY);   //Mutator Function
   int get_y();   //Accessor Function
   int get_x();   //Accessor Function
private:
   int x;
   int y;
};
int main () {
   Point p1, p2(2,4);
   return 0;
}
Point::Point(int x, int y) {
    this->x=x;   this->y=y;
}
Point::Point() { x=0; y=0; }
```



# mystring.h

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```
 1 #ifndef MYSTRING_H
 2 #define MYSTRING_H
 3 class string{
 4    private:
 5       int len;
 6       char *s;
 7    public:
 8       string(); //default should set s to NULL and len is zero
 9       string(const char *); //set to specific string and change len
10       int length() const;
11       char at(int) const;
12 };
13
14 #endif
~
~
~
~
~
~
                                                    1,1           All
```

# mystring.cpp

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```
 1 #include "./mystring.h"
 2 #include <string.h> //or cstring for c-style strings
 3 #include <iostream>
 4 using std::cout;
 5 using std::endl;
 6
 7 string::string(){ //default should set s to NULL and len is zero
 8    s=NULL;
 9    len=0;
10 }
11 string::string(const char *str){ //set to str and change len
12    len=strlen(str);
13    s=new char[len];
14    for(int i=0; i<len; i++)
15       s[i]=str[i];
16 }
17 int string::length() const {
18    return len;
19 }
20 char string::at(int i) const {
21    if(i>=len || i<0) {
22       cout << "Error!" << endl;
23       return '\0';
24    }
25    else
26       return s[i];
27
28 }
                                                    22,7          All
```

# main.cpp (Driver program)

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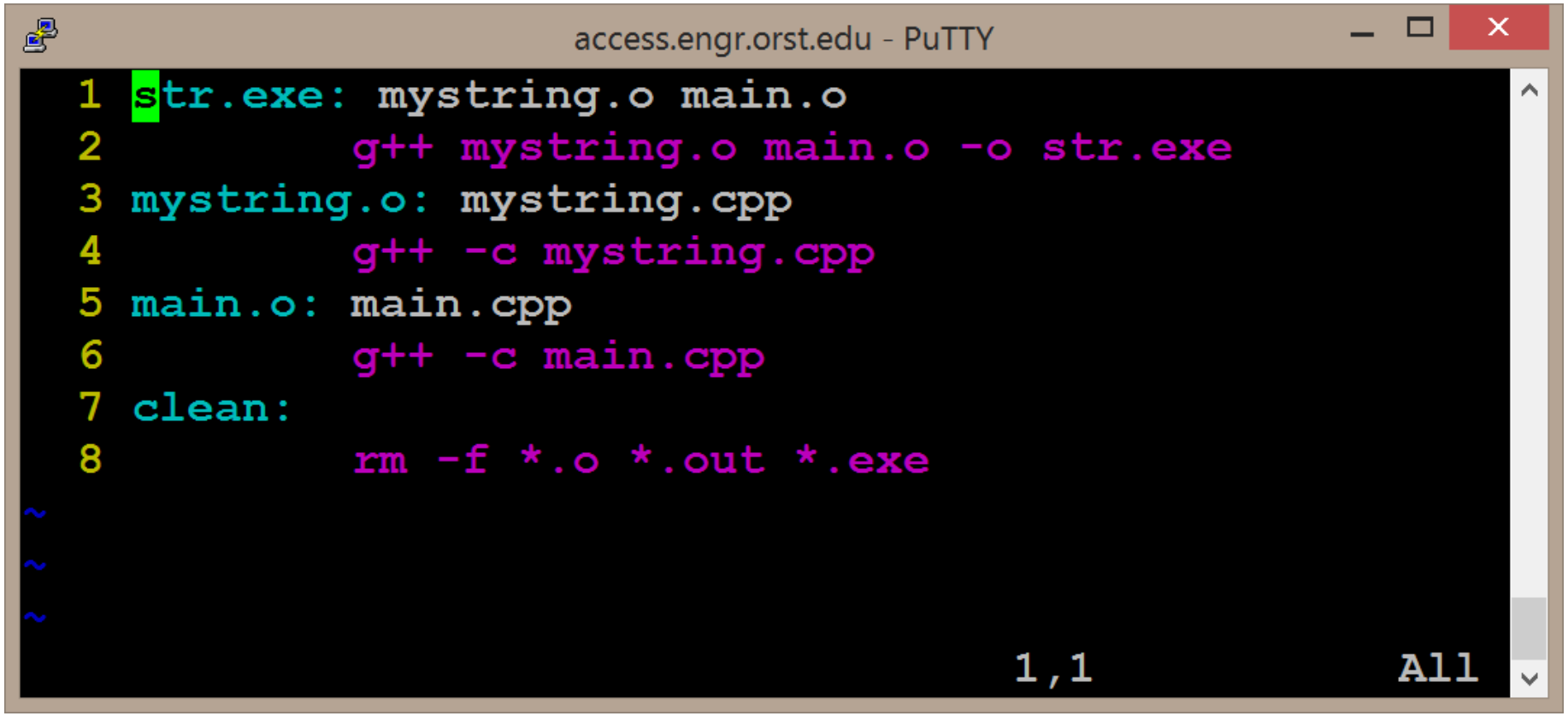
```
 1 #include "./mystring.h"
 2 #include <iostream>
 3
 4 using std::cout;
 5 using std::endl;
 6
 7 int main() {
 8    string s, s2("hello");
 9
10    cout << s.length() << endl;
11    cout << s2.length() << endl;
12    cout << s.at(0) << endl;
13    cout << s2.at(1) << endl;
14    return 0;
15 }
~
~
~
~
~
"main.cpp" 15L, 255C                          13,4          All
```

# Makefile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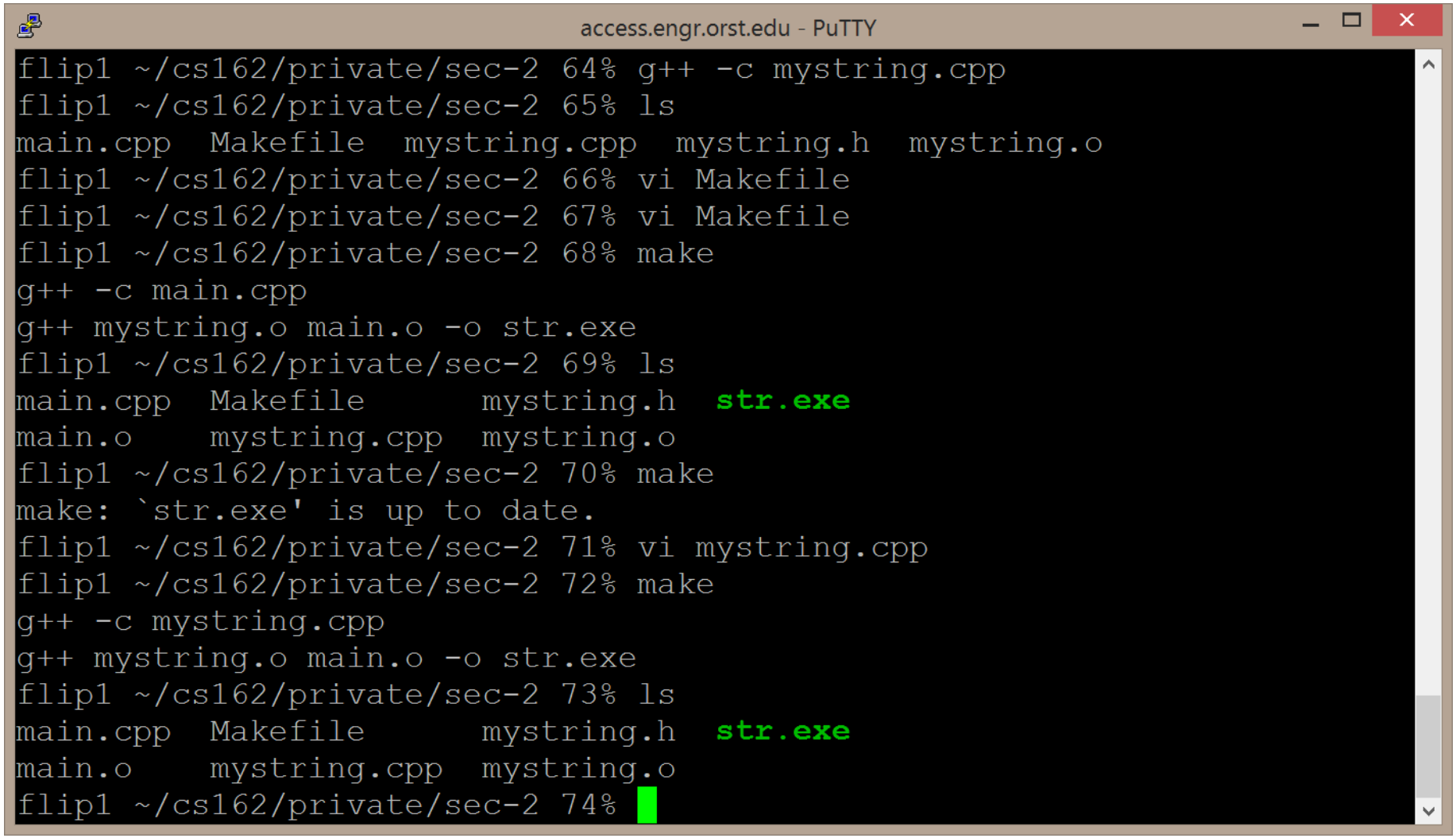
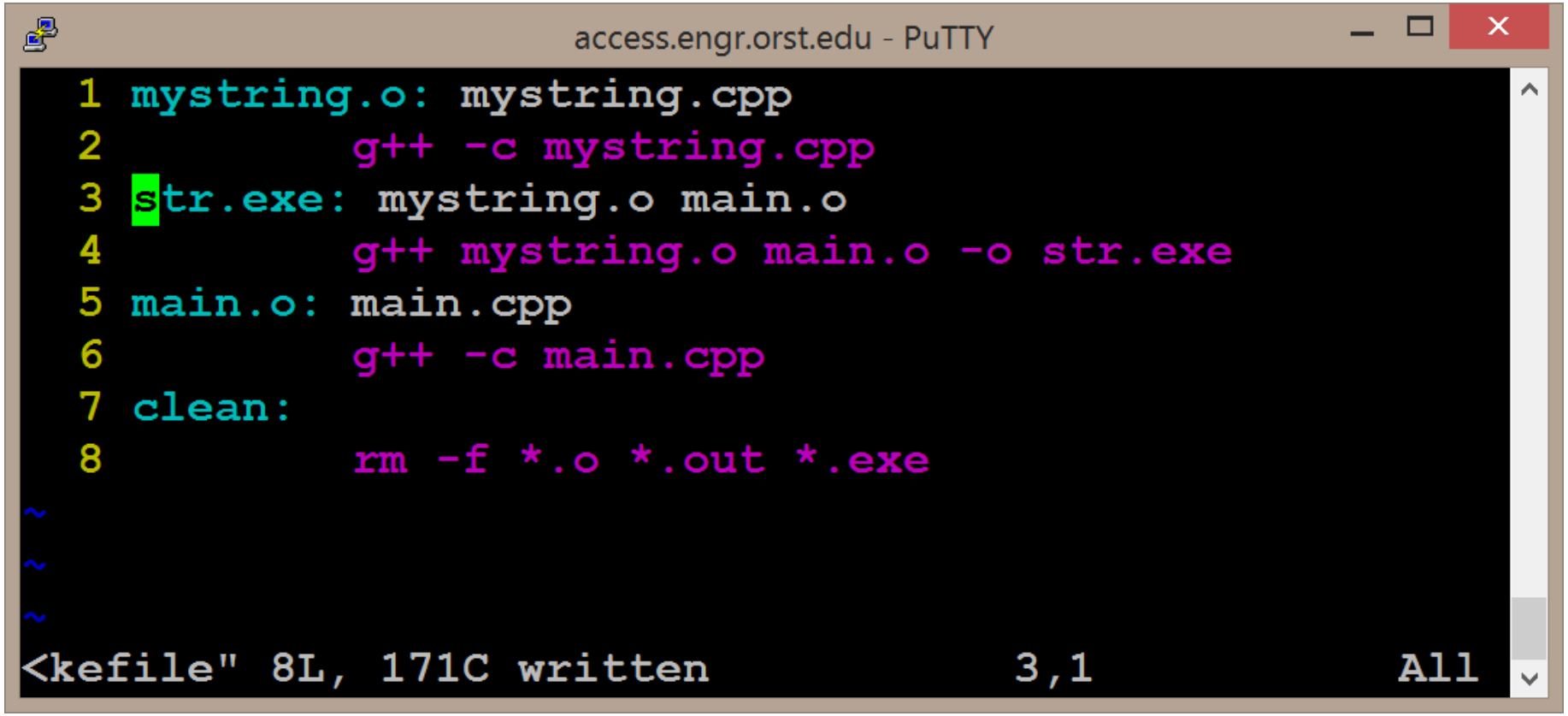
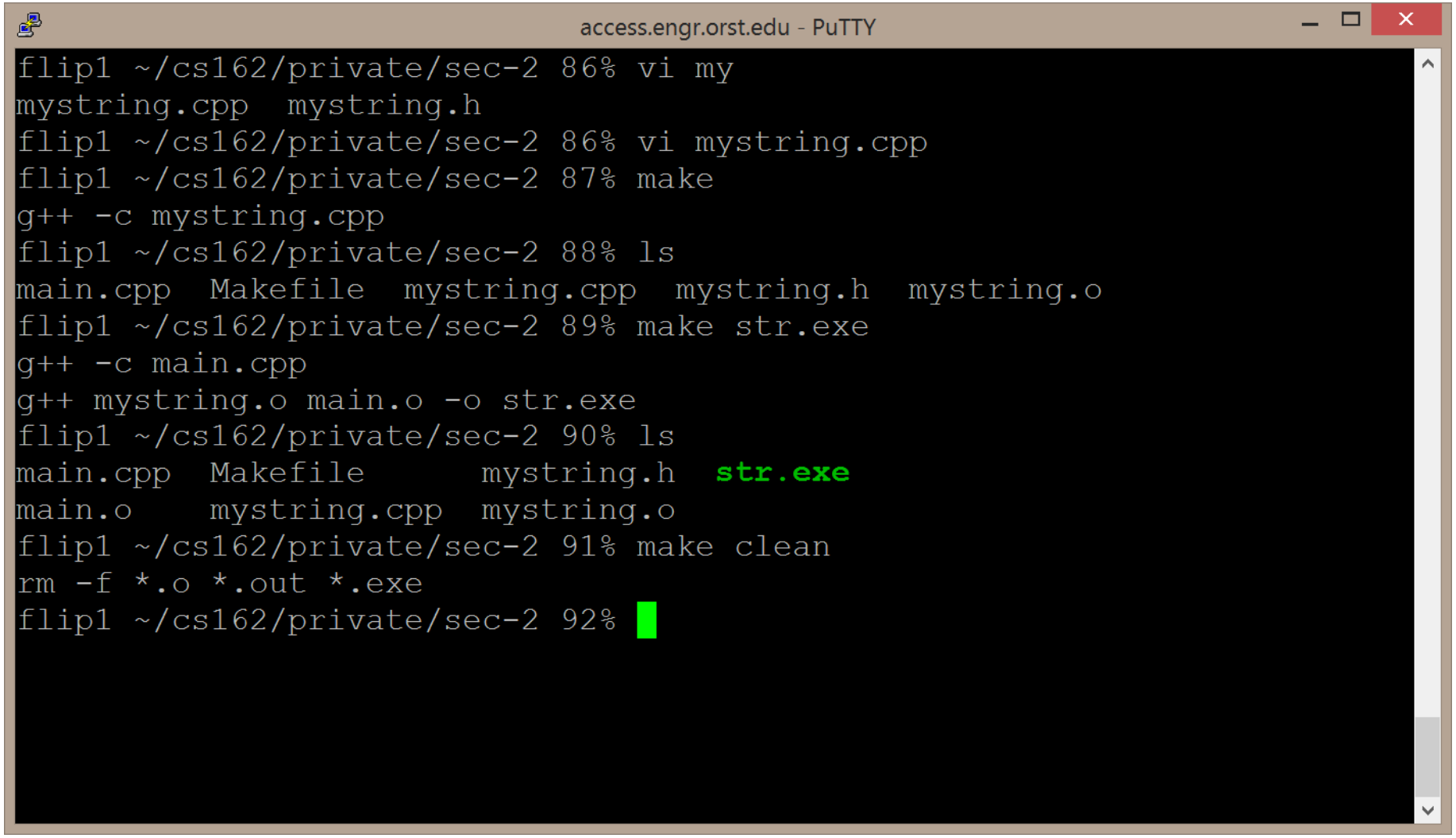
1 str.exe: mystring.o main.o
2 g++ mystring.o main.o -o str.exe
3 mystring.o: mystring.cpp
4 g++ -c mystring.cpp
5 main.o: main.cpp
6 g++ -c main.cpp
7 clean:
8 rm -f *.o *.out *.exe
~
~
~
1,1 All


access.engr.orst.edu - PuTTY
flip1 ~/cs162/private/sec-2 64% g++ -c mystring.cpp
flip1 ~/cs162/private/sec-2 65% ls
main.cpp  Makefile  mystring.cpp  mystring.h  mystring.o
flip1 ~/cs162/private/sec-2 66% vi Makefile
flip1 ~/cs162/private/sec-2 67% vi Makefile
flip1 ~/cs162/private/sec-2 68% make
g++ -c main.cpp
g++ mystring.o main.o -o str.exe
flip1 ~/cs162/private/sec-2 69% ls
main.cpp  Makefile  mystring.h  str.exe
main.o  mystring.cpp  mystring.o
flip1 ~/cs162/private/sec-2 70% make
make: `str.exe' is up to date.
flip1 ~/cs162/private/sec-2 71% vi mystring.cpp
flip1 ~/cs162/private/sec-2 72% make
g++ -c mystring.cpp
g++ mystring.o main.o -o str.exe
flip1 ~/cs162/private/sec-2 73% ls
main.cpp  Makefile  mystring.h  str.exe
main.o  mystring.cpp  mystring.o
flip1 ~/cs162/private/sec-2 74%

# Makefile (bad order)

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flip1 ~/cs162/private/sec-2 86% vi my
mystring.cpp  mystring.h
flip1 ~/cs162/private/sec-2 86% vi mystring.cpp
flip1 ~/cs162/private/sec-2 87% make
g++ -c mystring.cpp
flip1 ~/cs162/private/sec-2 88% ls
main.cpp  Makefile  mystring.cpp  mystring.h  mystring.o
flip1 ~/cs162/private/sec-2 89% make str.exe
g++ -c main.cpp
g++ mystring.o main.o -o str.exe
flip1 ~/cs162/private/sec-2 90% ls
main.cpp  Makefile  mystring.h  str.exe
main.o  mystring.cpp  mystring.o
flip1 ~/cs162/private/sec-2 91% make clean
rm -f *.o *.out *.exe
flip1 ~/cs162/private/sec-2 92%