Compiling in C++

Translate from human-readable code to the machine instructions.

Source Code

fourtwo.cpp:

```
int main() {
  int x = 30;
  int y = 12;
  int z = x + y;
}
```

Assembly Code

fourtwo.s:

```
        (...14 Lines Omitted for Space...)
            movl    $30, -4(%rbp)
            movl    $12, -8(%rbp)
            movl    -4(%rbp), %ecx
            addl    -8(%rbp), %ecx
            movl    %ecx, -12(%rbp)
            popq    %rbp
            retq
        (...8 Lines Omitted for Space)
```

Object Code

fourtwo.o:

```
^?ELF^B^A^A^@^@^@^@^@^@^@^@^@^A^@>^@^A^@^@^@^@^@^
@^@^@
^@^@^@^@^@^@^@^@^@^@^@\230^A^@^@^@^@^@^@^@^@^@^@
^@^@^
@^@^@@^@^H^@^A^@UH\211å1ÀÇEü^^^@^@^@ÇEø^L^@^@^@\2
13Mü^
CMø\211Mô]Ã^@clang version 6.0.0-1ubuntu2
(tags/RELEAS
E_600/final)^@^@^@^T^@^@^@^@^@^@^@^@AzR^@^Ax^P^A^[
L^G^H
\220^A^@^@^\^@^@^@^\^@^@^@^@^@^@^@^@^_^@^@^@^@A^N^P
\206^BC
```

(line breaks added and more content omitted

Executable

```
fourtwo:
        ^?^B^A^A^@^@^@^@^@^@^@^@^@^B^@>^@^A^@^@^@\260^C@^
        @^@^@^@
        ^@@^@^@^@^@^@^@^@\220\260^X^@^@^@^@^@^@^@^@^@^@^
        @8^@
        ^@@^@^Z^@^Y^@^F^@^@^@^D^@^@^@@^@^@^@^@^@^@^@@^@@^
        @^@^@^@
        ^@@^@@^@^@^@^@^@\370^A^@^@^@^@^@^@\370^A^@^@^@^@^
        @^@^H^@
        ^@^@^@^@^@^@^C^@^@^@^D^@^@^@8^B^@^@^@^@^@^@8^B@^@
        ^@^@^@^
        @8^B@^@^@^@^@^@^\^@^@^@^@^@^@^@^\^@^@^@^@^@^@^@^A
        ^@^@^@^@
```

(line breaks added and content omitted for

Version Control

Pair Programming

Discuss with Neighbors:

- What are the rules for pair programming in CS 70?
- When you and your partner are in the middle of working on a homework, what searches would be smart uses of Google or Stack Overflow, and what on the web would cross the line into cheating or plagiarism?
- What are some of the benefits and costs of doing pair programming in CS 70?
- What are some ways to be a jerk to your partner? (That is, what are some specific behaviors to

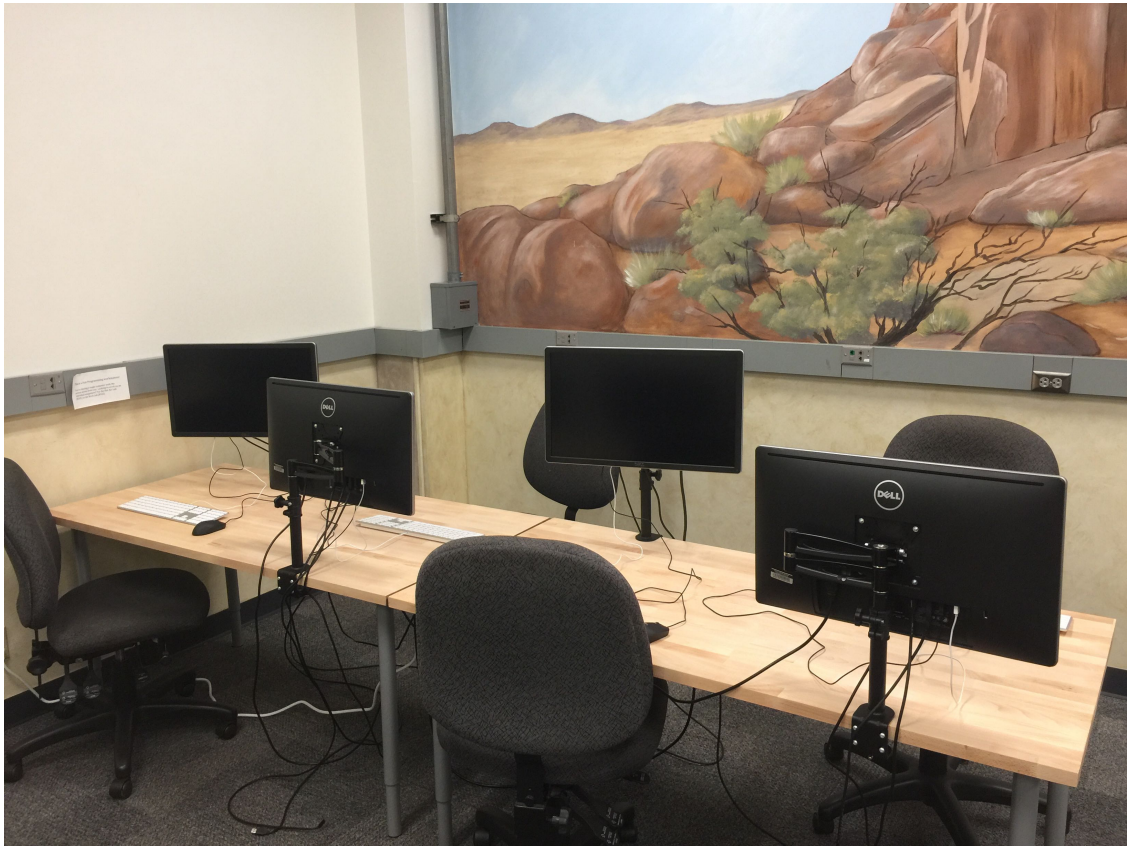
Question

What are the advantages of pair programming (in CS 70, or generally)?

Question

How can “Pair Programming” skills improve with practice?

The Rock Lab (BK B111)



RockLab.jpg

Class Exercise: Scenarios

1. Take one Scenario handout and write your name on it (legibly).
2. In groups of 4, decide how each of your scenarios is best described:
   - Encouraged
   - Acceptable
   - Discouraged
   - Forbidden
3. As a group, discuss how you could *change* your scenario to make it fall in another category.

1

Students A and B are paired. They try to compile their code, and get the error

```
corroborate.cpp:213:1: error: C++ requires a type specifier for all
 declarations
```

Seeing no obvious problems at line 213, column 1 of corroborate.cpp, the students enter

```
"C++ requires a type specifier for all declarations"
```

(the generic part of the error message) into Google. The first hit leads them to a Stack Overflow post explaining how someone else

2

Students A and B are paired. They get out two laptops, sit next to each other, and double their coding speed by editing two different files at the same time.

3

A CS 70 homework assignment asks for an implementation of Red-Black Trees. This data structure seemed to make sense in class, but afterwards Student A realizes that some parts still aren't clear. Before starting the homework, A browses the web and reads some other high-level explanations of Red-Black Trees, being careful not to look at detailed implementation discussions or source code.

4

Students A and B are paired. They sit together in front of one computer. A starts working on the CS 70 assignment. B pulls out a paper copy of a history paper and starts penciling in edits, while occasionally glancing up and making comments on A’s code.

5

Students A and B are paired. Because they work on different campuses, they work on separate computers in their own dorm rooms using “screen sharing” and on-line chat to discuss and edit the same file at the same time.

6

Students A and B are paired. Before they get very far, B falls ill. Several days later, just before the assignment is due, the professors are asked for an extension (because B was too sick all week to work).

7

Students A and B are paired. They have a bug in their code they just can’t figure out. In a public post on Piazza, they paste the lines of C++ code that they think are responsible and ask for help.

8

Students A and B are paired, but Student A has travel plans and cannot meet B until shortly before the assignment is due. While waiting in airports, A gets out a laptop and writes code for part of the assignment. Back on campus, A and B read through the code together, decide it looks good (except for one typo, which they correct), and then work together to finish the rest of the assignment.