

Homework 2

Due Date: 22 September 2006, by beginning of lab.

1. Write an *if-else* statement that outputs the word Passed provided the value of the variable `exam` is great than or equal to 60 and the value of the variable `programs_done` is great than or equal to 10. Otherwise, the *if-else* statement outputs the word Failed. The variables `exam` and `programs_done` are both of type *int*.

2. Consider a quadratic equation, say

$$x^2 - x - 2 = 0$$

Describing where this quadratic is positive involves describing the set of numbers that are either less than the smaller root or greater than the larger root. Write a C++ Boolean expression that is true when this formula has positive values.

3. Consider the quadratic equation

$$x^2 - 4x + 3 = 0$$

Describing where this quadratic is negative involves describing the set of numbers that are simultaneously less than the larger root or greater than the smaller root. Write a C++ Boolean expression that is true when the value of this quadratic is negative.

4. The following *if-else* statement will compile and run without any problems. however, it is not laid out in a way that is consistent with the other *if-else* statements we have used. Rewrite it so that the layout matches the style used in Chapter 2 of the text.

```
if (x < 7) {x = 7; cout << "x is positive."; } else {x = -7; cout << "x is now negative.";}
```

5. In algebra we see numeric intervals sometimes given as

$$2 < x < 3$$

In C++ this interval does not have the meaning you expect. Explain and give the correct C++ Boolean expression that specifies that x lies between 2 and 3.

6. Does the following sequence produce a division by zero error?

```
j = -1;
if((j > 0 && (1/(j+1) > 10)))
    cout << i << endl;
```

7. What output is produced by the following code, when embedded in a complete program?

```

int number = 22;
{
    int number = 42;
    cout << number << " ";
}
cout << number ;

```

8. Though you are urged not to program using this style, this example uses nested blocks to help solidify the scoping rules discussed in the text. Give the output that this code fragment would produce if embedded in an otherwise complete, correct program.

```

{
    int x = 1;
    cout << x << endl;
    {
        cout << x << endl;
        int x = 2;
        cout << x << endl;
        {
            cout << x << endl;
            int x = 3;
            cout << x << endl;
        }
        cout << x << endl;
    }
    cout << x << endl;
}

```

9. What does a *break* statement do? Where is it legal to put a *break* statement?
10. Section 3.3 Problem 21
11. Section 3.3 Problem 22
12. Section 3.3 Problem 25
13. Section 3.3 Problem 28
14. Section 3.3 Problem 29

For each question, I want the question written out, and the answer supplied directly beneath it. I've provided you with most of the questions, so you can just copy and paste out of the PDF file.

All submissions must be electronic, and should be emailed to the instructor. I accept PDFs, LaTeX source, PS files, plain text, RTF, etc.. Do not send me Word files, as they will not be accepted. I would recommend either LaTeX (if you know it), or just plain text (such as from notepad in windows, or emacs).