

## PIC 10A 1C Week 4b Problems. TA: Eric Kim

### 1. What Would C++ Do?

For each of the code snippets, write down the output of the program. If the code has an error, explain why, and whether it is a compile-time error or a runtime error.

C++ Code	What is the output?
<pre>string s1 = "yesterday"; cout &lt;&lt; s1.substr(0,3);</pre>	
<pre>string s2 = "revolution"; cout &lt;&lt; s2.substr(0);</pre>	
<pre>string s3 = "sgt"; cout &lt;&lt; s3 + "peppers";</pre>	
<pre>cout &lt;&lt; "sgt" + "peppers";</pre>	
<pre>string s4 = "ForNoOne"; cout &lt;&lt; s4.substr(3,2) + s4.substr(0,3);</pre>	
<pre>string s5 = "Walrus"; s5[1] = 'o'; cout &lt;&lt; s5;</pre>	
<pre>const string s6 = "aow"; s6[0] = 'p'; cout &lt;&lt; s6;</pre>	

### References

<pre>int a = 42; int &amp;ra = a; a += 3; ra += 1; cout &lt;&lt; "a: " &lt;&lt; a &lt;&lt; " ra: " &lt;&lt; ra;</pre>	
<pre>int a = 1; int &amp;ra = 1; ra += 1; cout &lt;&lt; "a: " &lt;&lt; a &lt;&lt; " ra: " &lt;&lt; ra;</pre>	
<pre>int x = 3; int y = x; x = 42; cout &lt;&lt; "x: " &lt;&lt; x &lt;&lt; " y: " &lt;&lt; y;</pre>	
<pre>int x = 1; const int&amp; y = x; cout &lt;&lt; "x: " &lt;&lt; x &lt;&lt; " y: " &lt;&lt; y &lt;&lt; endl; x = 42; cout &lt;&lt; "x: " &lt;&lt; x &lt;&lt; " y: " &lt;&lt; y;</pre>	

```
int x = 1;      const int& y = x;  
y = 2;  
cout << "x: " << x << " y: " << y;
```

```
const int x = 1;      int& y = x;  
y = 42;  
cout << x << " " << y;
```

## 2. IO Manipulation for Fun and Profit

Louis Reasoner would like to write a program that pseudo-illustrates addition. Given two numbers, each with fewer than 4 digits, the output of the program is:

You entered: 42, 1. The sum is:

```
00042  
+ 00001  
-----  
00043
```

Louis writes the following program. Is the program correct? If not, describe what the program would instead output, and try to fix it.

```
int main() {  
    cout << "Give me two numbers to add:" << endl;  
    int x1, x2;  
    cin >> x1 >> x2;  
    cout << "You entered: " << x1 << ", " << x2 << ".";  
    cout << " The sum is:" << endl;  
    cout << setw(5) << setfill('0') << " " << x1 << endl;  
    cout << "+" << x2 << endl;  
    cout << "-----" << endl;  
    cout << " " << x1+x2 << endl;  
    return 0;  
}
```

### 3. Long Division? More like, Wrong Division!

Write a program that illustrates long division. Suppose we want to illustrate  $42 / 2$ . The output of your program should be:

Let's divide 42 by 2:

$$\begin{array}{r} 00021 \\ \hline 00002 \mid 00042 \end{array}$$

You may assume that the user will only input integers with at most 5 digits, and that the numbers are evenly divisible. For instance, we disallow dividing 16 by 3 ( $16 / 3$ ).

Hint: To make the vertical bar "|", use the pipe character on your keyboard (SHIFT+backslash). To make the horizontal line "\_", use the underscore character (SHIFT+hyphen).