

CS 145: Scientific Programming

Review problems for C++ topics

1. Identify at least 4 errors in the following code:

```
#include <iostream>
#include <fstream>
#include <cmath>
using namespace std;

main {
    cout >> "Enter a number";
    cin >> c;

    if (c > 10); {
        cout << "That is a large number" << endl
    }
}
```

2. Convert the following Matlab code to C++:

```
x = [0:.1:1];
y = sin(x);
z = x .* y;
```

Note: don't forget that C++ doesn't have array operations like Matlab does.

3. Write a program that prompts the user to enter the radius of a circle and prints the circle's diameter, circumference, and area. Use the value 3.14159 for π .
4. (a) Write a function called factorial that accepts as input an integer n and computes $n!$, the product of the first n numbers.
(b) Write a main to test your function by prompting the user to enter a number and printing the factorial of that number as output.
5. Convert the following Matlab program to C++:

```
height = 0;
dt = .1;
for t=0:dt:60
    height = height + (t+sin(t))*dt;
end
```