

CS 211 Winter 2004

Practice Quiz One

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Your Name:

Each problem counts for 20 points. They are not all of equal difficulty. Please read all of them before starting and attempt the least difficult first.

When time is up, please stop writing and turn in your quiz. If you have to be asked to stop you will receive no credit for the question you are working on.

Problem 1	
Problem 2	
Problem 3	
Problem 4	
Problem 5	
Total	

Problem 1

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

int factor = 0;
int helper(int x) {
    static int accum = 1;
    if (x) {
        return accum;
    } else {
        accum *= factor; return helper(x - 1);
    }
}

int mystery(int e, int p) {
    factor = e;
    return helper(p);
}

int main(int argc, char* argv) {
    cout << mystery(2, argc) << endl;
    cout << mystery(argc, 2) << endl;
}
```

10 Points. Draw a sketch of the machine's memory when x equals 1 the second time.

5 points. If the program is compiled to `expo` and run as `./expo two three`, what gets printed?

5 points. A previous 211 student, N. U. Bie, expects `8 9` to be printed. Fix the code to match his expectations.

Problem 2

10 Points. Explain what a null terminated string is and sketch one out for the string "glurg"

10 Points. Discuss why strings, character arrays, and character pointers all seem interchangeable in C/C++.

Problem 3

For the following procedures, find the error and correct the procedure

```
int f1() {
    cout << "Inside f1" << endl;
    int h1() {
        cout << "Inside h1" << endl;
    }
}

int f2(int x) {
    int result;
    result *= x;
    return result;
}

int f3(int n) {
    (n == 0) ? return (n + f3(n-1)) : return 0;
}

int f4(int a) {
    float a = 3.14159;
    cout << a << endl;
    return a;
}

int fact(int rem, int res) {
    (rem == 1) ? return res :
    return (fact (- rem 1) (* rem res));
}
```

Problem 4

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

int main(int argc, char* argv[]) {
    for (char** cur = argv; cur < (argv + argc);) {
        for (int i = 0; i < strlen(*cur); i++) {
            cout << (*cur)[i];
        };
        cout << endl; cur++;
    };
};
```

Suppose we compile the above code into an executable named `quiz1`. Then we run the following command line:

```
quiz1 one two three four
```

5 points. What will be printed out?

5 points. Rewrite the outer loop so that it uses array indexes instead of pointer arithmetic.

Problem 4 continued, 10 points. Rewrite the inner loop using a `while` statement and have it reverse the sequence of things it prints out.

Problem 5

For each of the following statements indicate whether it is true or false (2 points) and give a brief explanation (2 points).

The only parameter passing mechanism that C/C++ supports is call-by-value.

The expression `'\0'` will evaluate to truth in a boolean expression.

In the following code, `some_var` has file scope.

```
void mystery() { static double some_var = 12.34;}
```

The following assignment is illegal, since the left hand side is not an lvalue `char s[5]; s[3] = 'b';`

In a von Neumann machine, there is a different memory for code, a different memory for globals, and a different memory for local variables.