

CSci 1113

Midterm 2

Name: _____

Student ID: _____

Instructions: Please pick and answer any 6 of the 7 problems for a total of 60 points. If you answer more than 6 problems, only the first 6 will be graded. The time limit is 50 minutes. Please write your answers in the space provided. The exam is open book and notes. You may use electronic devices to **ONLY** look at either an e-book version or electronic notes. You may not use the internet, compiler or any other outside resources. (If you are typing on your keyboard/input device for anything other than ctrl-F to find words in the e-book or notes, this is probably not acceptable.)

Problem (1) [10 points]

Write a function in C++ that takes a string array as input and returns the longest string in the array.

Problem (2) [10 points]

What is the output of this code: (You must show work to receive full credit.)

```
int hi(int x) {
    if(x < 3) {
        return x;
    }
    return 1+hi(x-2)+hi(x/2);
}

int main() {
    cout << "Recursion: " << hi(9) << endl;
}
```

Problem (3) [10 points]

Write C++ code that reads a file “numbers.txt” and counts the average (i.e. mean) of them. You may assume this file only contains integers.

Problem (4) [10 points]

What is the output of this code: (Show work for full credit)

```
int main() {
    int uhoh[4][4];
    for(int i=0; i < 4; i++) {
        for(int j=0; j < 4; j++) {
            uhoh[i][j] = 1;
        }
    }
    for(int i=1; i < 4; i++) {
        for(int j=i; j < 4; j++) {
            for(int k=i; k < 4; k++) {
                uhoh[j][k] += uhoh[j-1][k];
            }
        }
    }
    for(int i=0; i < 4; i++) {
        for(int j=0; j < 4; j++) {
            cout << uhoh[i][j] << " ";
        }
        cout << endl;
    }
}
```

Problem (5) [10 points]

Write code in C++ to do the following: assume there are two arrays called “A” and “B” already declared and initialized. These arrays are of length “sizeA” and “sizeB” respectively. Cout whether or not these two arrays are the same (i.e. the numbers inside the array match up).

Example 1: A = [1, 2, 3], sizeA = 3, B = [1, 2, 3] sizeB = 3... cout: same

Example 2: A = [5, 6], sizeA = 2, B = [5, 6, 7, 8] sizeB = 4... cout: different

Problem (6) [10 points]

Write a **recursion function** in C++ that takes a string and character as input. This recursive function should cout all the indexes where the character appears in the string (separated by spaces).

Problem (7) [10 points]

Find 3 errors in the code below. Assume that the code is completely shown except for #includes and “using namespace std”. For each error, identify whether it is a runtime error, syntax error or logic error. You must also precisely describe why you think the part of code you identify is an error.

```
int main() {  
  
    ifstream out;  
    out.open("copy.txt");  
    if(out.fail()) {  
        cout << "Error! Stopping!\n";  
        exit(1);  
    }  
    cout << "A bunch of numbers... type just 'quit' to stop:\n";  
    string str = "boom shakalaka";  
    while(str != "quit") {  
        getline(cin, str);  
        out << str;  
    }  
    cout << "Just the numbers are copied to 'copy.txt' (same format as entered)\n";  
    return 0;  
}
```