CS 201 Final Exam

Name

1) I put my name on the test.

No, because I want to fail No, I cannot take a hint Yes; I’m not stupid or forgetful.

Control Structures

1) What does this code print?

int grade = 75;  
 if (grade > 70)

cout << “C\n”;

else if (grade > 90)

cout << “A\n”;

if (grade > 60)

cout << “Passing\n”;

else

cout << “Not passing\n”;

2) How many lines does this code print?

for(int x = 0; x < 10; x++)

for(y = 100; y > 90; y--)

cout << x << y << endl;

Pointers

1) Which of these statements is legal? You may pick zero or more.

int j, k, \*p, \*q;

j = p; p = j; j++; p++; j=&p; p = &j;

2) (True/False) In the code below, p points four bytes further into RAM than q.

int array[10];

int \*p = &array[0];

int \*q = p+4;

Rhinos

1) Why don't rhinos fly in planes?  
        Weight  
        Inadaquate bathroom facilities for rhino special needs  
        Difficult to start the engines without fingers

Operator Overloading

4 points) Write the function that overloads the + operator such that the code below works. Write the code that makes the cout line work. Both should be examples of operator overloading.

Class Fraction {

public:

int top, bot;

Fraction(int t = 0, b = 1) {

top = t; bot = b;

}

// YOUR PLUS CODE HERE

// YOUR COUT CODE HERE

};

int main() {

Fraction f1(1,3);

Fraction f2(2,5);

Fraction f3 = f1 + f2;

cout << f3 << endl; // This is the cout line

}

ALGORITHMS

1) (Linked/Bloom) Which is faster, or search a linked list for an item or to check a bloom filter for that item?

2) What things can a bloom filter say? Choose ONE.

Either “Definitely yes” or “Maybe no”

Either “Maybe yes” or “Definitely no”

3) What does this code print? Assume it’s a correctly working stack.

Stack s;

s.push(“first”);

s.push(“middle”);

s.push(“last”);

cout << s.pop() << endl;

4) Which needs less space?

* 1. An array with 1000 ints
  2. A linked list with 1000 ints.
  3. They are the same

5) Which is quicker?

* 1. Insert into an unordered linked list as fast as possible.
  2. Insert into an ordered linked list as fast as possible.

Files

1) Write some code that checks to make sure the file was opened correctly. Print “Arg” if there was some sort of error.

ifstream input(“input.txt”);

ofstream output(“output.txt”);

// ERROR CHECKING CODE GOES HERE

string thing;

int count = 0;

while (input >> thing)

count++;

cout << count << endl;

output << count << endl;

2) (Characters/Words/Lines) What does the code above count?

3) Suppose the file ‘output.txt’ contains the text “The answer is “. Then I run the program above. It prints “17” because count ends up being 17. What is in the file ‘output.txt’ when the program finishes? Choose ONE.

17

The answer is 17

Linked Lists

Four Points: Write me some code that returns the smallest item in the linked list as shown below.

Class Node {

public:

int data;

Node \*next;

public Node(int d) {

data = d;

next = nullptr;

}

// CODE THAT IMPLEMENTS SMALLEST

};

int main() {

Node \*head = new Node(3,nullptr);

head→next = new Node(19);

// A bunch more code that adds a bunch more nodes

cout << head→ smallest() << endl;

}