

CS 115 Midterm 2B Solutions

November 13, 2008

Rules

- You must briefly explain your answers to receive partial credit.
- When a snippet of code is given to you, you can assume that the code is enclosed within some function, even if no function definition is shown. You can also assume that the `main` function is properly defined and that the `iostream`, `fstream`, `omanip`, `string`, and `cmath` libraries have been included at the beginning of the program.
- When you are asked to write *a snippet* of code, you may also assume that it is enclosed within some function that any necessary libraries have been included.
- When you are asked to write *a complete program*, you must write the `#include` statements, the `int main()`, etc. in your solution to receive full credit.
- A line consisting solely of “...” represents one or more unspecified C++ statements, some of which may change the values of program variables.
- You are encouraged to use the backs of these pages for scratch paper. If you want answers written there to be graded, they must be very clearly labeled and also noted on the main test, e.g. “See the back of page 1 for 3a.”

Problem 1: 15 points.

What is the output of each of the following snippets of code?

(a) (6 points)

```
int q = 8;
int *ptr = &q;
*ptr += 10;
cout << *ptr << endl;
cout << q << endl;
```

18

18

(b) (3 points)

```
int a[6] = {5, 8, 7, 9, 13, -1};
cout << a[1];
```

8

(c) (6 points)

If the following function is defined somewhere in the program and prototyped above main....

```
int square(int& x) {
    return x*x;
}
```

...what does the following code print?

```
int x = -5;
int y = square(x);
cout << x << endl;
cout << y << endl;
```

-5

25

Problem 2: See Midterm 2A solutions.

Problem 3: 25 points.

The snippets of code in this problem do not successfully accomplish the task described in their accompanying comment. Correct the code so that it performs the task described in the comment. The code may have more than one error. **Make your corrections clear and unambiguous.**

(a) (10 points)

```
/* Function that finds and returns the largest element
of an integer array. Inputs are the array and its
size */
int FindMax(int[] array, int size) {
    int max = 0;
    for (int i=0; i <= size; i++) {
        if (i > max) {
            max = array[i];
        }
    }
}
```

5 corrections (underlined):

```
int FindMax(int array[], int size) {
    int max = array[0];
    // Note: we can now start at i=1 but don't have to
    for (int i=0; i < size; i++) {
        if (array[i] > max) {
            max = array[i];
        }
    }
    return max;
}
```

(b) See Midterm 2A solutions.

(c) See Midterm 2A solutions.

Problem 4: 25 points.

Write short snippets of code to accomplish the following tasks:

(a) (7 points)

For an array that has been declared as

```
float floatArr[5][8];
```

write a snippet of code that computes and prints the total of all the elements in the **entire array**.

```
float sum = 0;
for (int i=0; i<5; i++) {
    for (int j=0; j<8; j++) {
        sum += floatArr[i][j];
    }
}
cout << sum;
```

(b) (6 points)

For this problem, you may assume that the `struct inventory` from Problem 2b has been declared above the main program. Write a snippet of code that declares an `inventory` array of size 20 and initializes the `price` to 1.25 for each element of the array.

```
inventory invArr[20];
for (int i=0; i<20; i++) {
    invArr[i].price = 1.25;
}
```

(c) See Midterm 2A solutions.

Problem 5: See Midterm 2A solutions.