

CS 115 Exam 2, Fall 2009

Your name: _____

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
 - that the `main` function is properly defined
 - that the `iostream`, `algorithm`, `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 assume
 - that your code 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.”
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Grade (instructor use only)

| | |
|--------------|--|
| Problem 1 | |
| Problem 2 | |
| Problem 3 | |
| Problem 4 | |
| Total | |

Problem 1: 25 points.

What does each of the following snippets of code print to the screen?

(a) What does this snippet of code print?

```
for (int i = 1; i < 4; i++) {  
    for (int j = 1; j <= i; j++) {  
        cout << i+j << " ";  
    }  
    cout << endl;  
}
```

(b) What does this snippet of code print?

```
float a[3] = {2.2, 3.3, 4.4};  
cout << a[1] << endl;
```

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

```
int triple(int x) {  
    return x*3;  
}
```

...what does the following code print?

```
int x = 5;  
triple(x);  
cout << x << endl;
```

(d) For the snippet of code...

```
char c[50];
```

...what is the datatype of c?

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

```
void InitArray(int x[][5]) {  
    for (int i=0; i<5; i++) {  
        for (int j=0; j<5; j++) {  
            x[i][j] = i + j;  
        }  
    }  
}
```

...what does the following code print?

```
int array[5][5];  
InitArray(x);  
cout << x[2][3] << endl;
```

Problem 2: 20 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)

```
/* Function that you can call to swap the values of
two integer variables */
void Swap(int a, int b) {
    a = b;
    b = a;
}
```

(b)

```
/* Declares an array of 3 floating-point values and
sets them all to 1 */
float values[2] = 1;
```

(c)

```
/* Function that takes an array, its size, and some
value. Returns TRUE if all array elements are greater
than this value and false otherwise. */
```

```
float CompareValues(int[] arr, int size,
    int some_value) {
    for (int i=0; i<= size; i+1) {
        if (i > value) {
            return true;
        }
    }
}
```

Problem 3: 25 points.

Write short snippets of code to accomplish the following tasks:

(a) For an array that has been declared as

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

write a snippet of code that finds and prints the largest element in the **entire array**.

(b) Repeatedly ask the user to enter an integer. Keep prompting until the user enters a positive integer. Be careful to account for the possibility that the user enters a letter.

(c) Write a *function* that takes 2 integers as inputs and returns whichever value is larger.

Problem 4: 30 points.

For this problem, you must write a **complete program** that contains the following:

- A function, defined below the main function, called `ReadAnimals` with the following properties:
 - Parameters:
 - `stringArr`, an array of chars
 - `N`, an integer (the size of the array)
 - Return value: none
 - Description: For each of the `N` array elements, this function should prompt the user to enter the name of an animal and read that name into the array.

- Prototype for `ReadAnimals`

- A function, defined below the main function, called `FindItem` with the following properties:
 - Parameters:
 - `inputArr`, an array of strings
 - `N`, an integer (the size of the array)
 - `value`, a string
 - Return value: an integer
 - Description: The function should search for `value` in the elements of the array `inputArr` and return the *array subscript* where it is first found. If none of the items in the array are equal to `value`, return -1.

- Prototype for `FindItem`

- A `main` function that does the following:
 - Declares an array of 10 strings
 - Calls `ReadAnimals` to initialize the array
 - In an infinite loop:
 - Prompts the user to enter the name of an animal.
 - Calls `FindItem` to search for that name in the array of strings
 - If the animal's name was found, prints
Found _____ at index _____
The first blank should be filled in with the name of the animal, and the second blank should be the array subscript where it was found.
 - If the animal's name was not found, prints
Not found.

