

CS 210 - Introduction to Computer Science
Fall 2016 – Final Exam Review 2

Final Exam is Thursday, December 8 at 2:00pm

The exam is open book and open notes. The final is 2 hours long – all written – *no practical*.

Sample problems for review

1. What is wrong with the following sequence.

```
char str1[] = "First String";  
char str2[] = "Second string";  
strcat(str1, str2);
```

2. Draw a circle around ONLY those statements below which are TRUE.

- A) An array can store many different types of values.
- B) An array subscript should normally be of data type *float*.
- C) If there are fewer initializers in an initializer list than the number of elements in the array, the remaining elements are automatically initialized to the last value in the list of initializers.
- D) It is an error if an initializer list contains more initializers than there are elements in the array.
- E) An individual array element that is passed to a function and modified in that function will contain the modified value when the called function completes execution.

3. Show what is printed by the following program segment.

```
int a[] = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9,  
10};  
int *xPtr, *yPtr;  
xPtr = &a[3];  
yPtr = &a[7];  
printf("%d %d\n", *xPtr, *yPtr);  
printf("%d\n", yPtr - xPtr);
```

Printed Results

4. Explain the difference between the following two uses of the * operator.

```
int *q = p;  
n = *p;
```

5. Write a short sequence of code to do the following:
- A) Prompt the user to input a positive integer called *n*.
 - B) Dynamically allocate an array of type double of size *n*.

6. What is wrong with the following code sequence?

```
int j = 7;
if(j > 3)
    {int i = 12;
      i = j * i;
      printf("%d, %d\n", j, i);
    }
printf("%d, %d\n", j, i);
```

7. Suppose I have the following typedef statement for a struct:

```
typedef struct
{double x;
 double y;
}pt_t;
```

A) Show how to create an array named *a* of this type of size 20.

B) Write a prototype for a function named MyFun which returns a void but accepts the array in part A as an argument:

8. Given below is a typedef and a function prototype.

```
typedef struct
{double x;
 double y;
}pt_t;
```

```
void FindPoint(pt_t *p1, double d, double theta);
```

Note that the first parameter is a pointer to the typedef variable. Write the code for the function which will set the x and y variables of p1 to the location of a point that is d units from the origin at an angle of theta (in radians).

9. For a struct defined as:

```
typedef struct
{double x;
 double y;
}pt_t;
```

Create an array of 100 pt_t and fill each x and y value with a random double from -1 to +1.

10. Given that char c is an alphabetical letter show two ways a user can check if it is a capital letter.

11. Assume that two arrays have been defined with the first being a one-dimensional int array with 1000 elements and the second being a two-dimensional double array with 18 rows and 24 columns. The following call statement in a main program calls a function and passes it these two arrays. Write the prototype for the function.

```
int Fun1(aIntArray, bDoubleArray);
```

12. Why are dynamic arrays needed. Why don't we just use static arrays for everything.

13. Write a recursive function to print a classic C-string recursively. Name your function PrintRecursive. Provide a sample call from a main program to print the string given by
`char s[] = "Hello mom!";`

14. How many characters are in each of the following character and string constants?

- A) '\n' _____
- B) 'n' _____
- C) "Hello" _____
- D) "n" _____
- E) "Hello\n" _____

15. Suppose an integer and an integer array has been declared as:

```
int a[45];  
int i = 12;
```

If the array has been filled with random data, is the following logical expression true or false?

```
(a[i] == *(a+i));
```