CS 210 - Introduction to Computer Science

Fall 2016 - Exam 3 Review Sheet

Exam 3 will be on Thursday, November 17. The exam is open book and open notes.

The exam will consist of questions on the material in Chapter 7, 8, 10, 12, & 13. The format of the exam will be similar to that of in-class exercises, homework questions, lab questions, and programming assignments. That is, you will be asked to write implementations for programs and functions to solve particular problems, and you will be asked to read and write C code examples.

The following is a list of topics that will be emphasized.

1. Use of arrays as parameters.
2. Multi-dimensional arrays
3. Strings and string operators.
4. Personal libraries and header files.
5. Pointers.
6. Dynamic memory allocation.
7. Structs
8. Short answer on linked lists, stacks, and queues

When you are asked to write code, you will not need to write comments, function prototypes, include directives, or output formatting beyond producing new lines in appropriate places.

CS 210 **November 10, 2016**
Sample Questions for Exam 3

1. Suppose a variable is defined by `int n = 12;`. Write a few lines of code to create a pointer called nPtr and make it point to n.

2. Why is it that you can subtract two pointers but you are not permitted to add them.

3. If a char require 1 byte of storage, how many bytes of memory are required to store the c-style string defined by `char myString[] = "Jello is good.";`

4. Write a program to input a single line of text using the `gets` function. Print out the characters in positions 4 through 12 (inclusive) on one line. If there are less than 4 characters print the word "none". If there are less than 12 characters entered print only up to the end of the input line.

5. Write a program sequence which allows a user to enter integers into an array whose dimension is 10. The integers in the array must be in the interval $1 \leq x \leq 5$. Your sequence should issue a brief error message when an integer is entered outside of this range. Continue entering integers into the array until either the array is full or the user enters 0 as a sentinel ending value.

For this problem a complete program is not necessary only the sequence containing the entry loop.

6. Write a function to accept a single sentence as an argument. Your function should print the sentence with every other character replaced by a blank. For example, if the sentence is:

```
Hello Mom, I like jello.
```

your program should print:

```
H l o M m     i e j l o
```

Note that in some cases a blank is replaced with a blank. Your function will not return a value.

7. Write a short sequence to prompt the user for an array dimension and create a two dimensional square array of that dimension dynamically that contains all zeros. For example, if the user enters 200 in response to the prompt your program might create an array as `arr[200][200]` and fill it with zeros.

8. Write a single line of code to use the *calloc* operator to dynamically define an integer array which has 100 items. Fill it with random integers between from 1 to 6.

9. If an int requires four bytes for storage how many bytes are required for storage of the following array:

```
int a[12][10][3];
```

10. 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];
cout << *xPtr << " " << *yPtr << endl;
cout << yPtr – xPtr << endl;
```

Printed Results

_____

_____

_____

11. Write a declaration for

A) A pointer to an array of 8 doubles declared by `double a[8];`

B) An array of 8 pointers to doubles.

12. In the code sequence below two arrays have been declared. Write the additional lines to copy the 3rd row of array a into array b.

```
int a[7][6];
int b[6];
...
// Assume code here fills a with data.
...
// Put your code below
```