

CS 210 - Introduction to Computer Science
Fall 2016 - Exam 1 Review Sheet

Exam 1 will be on Thursday, Sept. 22 , 2016. The exam is open book and open notes.

The exam will consist of questions on the material in Chapters 1 to 5. The exam will have three sections. In section 1 you will be asked to answer short answer questions related to all of the topics in the reading material. In section 2 you will be given a program or a portion of a program and asked to explain what the program does. In section 3 you will be asked to write a program.

Topics covered include the following:

Design of main programs and functions. Differences between received, returned, and local function objects.

Declaration and use of constants and variables.

Use of arithmetic, relational, and logical operators.

Assignment statements.

Basic use of input and output statements (printf and scanf with format specifiers).

Implementation of functions, including how to define and use them, and (actual) arguments vs. (formal) parameters.

Use of IF and SWITCH construct.

Use of repetition constructs with while, for, and do while loops.

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

Sample Programs

1. Write a function which will calculate and return the factorial of the argument. Your function should return an int. A typical calling statement might look like this:

```
int x = 10;
int y;
y = Factorial(x);
```

You can use the three lines above in a main program to test your function. The factorial of 10 is 3628800.

2. Write a C program implementation to input a sequence of positive integers from the keyboard and print their average. The number of integers to be entered is unknown but the last integer will be a 0. Your program should prompt the user to enter an integer. If the integer is nonzero it should be part of the average but nothing should be printed except a prompt for another integer. This procedure should continue until the user enters a zero at which time your program should print the average of the numbers with the appropriate message.

3. Consider the program segment below and answer the following questions:

- A) For what range of values of n will the program print the letter e?
- B) If the user enters the number 101 in response to the prompt, what will be the output?
- C) If the user enters the number 52 in response to the prompt, what will be the output?
- D) If this program sequence runs one time, how many lines of print will it produce? If the number of lines of print produced is data dependent, explain how.

```
{int n;
printf("Enter a value for n... ");
scanf_s("%d", &n);
if(n >= 100)
    printf("a \n");
if(n < 100)
    {if(n > 50)
        if(n <= 75)
            printf("b \n");
        else
            printf("c \n");
        else if(n < 20)
            printf("d \n");
        else
            printf("e \n");
    }
return 0;
}
```

4. Write a function to return the sum of the integers from first to last where first and last are integer arguments passed to the function. Include both first and last in the sum.

