

COL 100 Lab 6

I semester 2016-17
Week 6, 2016

Objective

To be able to write C programs involving loops and conditional statements including switch case.

Instructions

1. After 1 hour 45 minutes has passed, your codes will be checked. Whatever you have completed till this point will be recorded. Anything that you complete later will not be recorded.
2. If you complete an assignment later, can ask the TAs of your lab session any problems and doubts that you face. There is no need to show the TA your code if there is no problem in it.
3. You cannot attend any lab session other than your allotted session, without informing the TA of the session you are attending. This too is permitted only for genuine reasons.
4. Also, you will not get the attendance, if you do not attend your own lab session, nor will your performance be noted. (Even if you fill up the attendance sheet it will not be updated later.)

Programs

- Press **Ctrl + Alt + T** to open a terminal.
- cd to the directory COL100.
- In this directory, create another folder, called lab6
- cd to lab6

NOTE: Add *printf* statements to see the flow of control of your code. It will also help you to find out the error, if there is any.

1. Write a C program to find all roots of a Quadratic equation using switch case.
2. Write a program to compute the square root of any given perfect square.
3. Find the GCD(Greatest Common Divisor) of two numbers, using loops- and then use that GCD to find out the Least common multiple(LCM) of the two numbers.
 - a) Write a simple loop to check for all numbers, which can be common divisors of 2 numbers, and return the greatest of them all. This will take $O(n)$ complexity.
 - b) Use Euclid's division algorithm to find the GCD. Hint: $\text{GCD}(a, b) = \text{GCD}(a, a\%b)$
4. Write a C program to print the PASCALS's triangle using for loop.

HOMEWORK ASSIGNMENTS:

5. Write C program to find the value of $\sin(x)$ using the series up to the given accuracy (without using user defined function). Also print $\sin(x)$ using library function.
6. Write a program to guess a number-
 - a) Program chooses, human guesses. The program should randomly choose a number between 1 and 100. Then it should ask the user to guess the number. In return the program should tell if the guess is less, equal to or more than the number. If it is less, the program should output 'l', and prompt the user for new guess. Similarly, if it is more, the program should output 'm', and prompt the user for new guess. This should continue till the user guesses the correct number. When the guess is correct, the program should terminate, and print the number of guesses he/she took.
 - b) Human chooses, program guesses The program should prompt the user, to choose a number of his choice between 1 and 100. Once the user has chosen, the program should make a guess and print on the screen. The user should be prompted to tell if the guess is correct by typing 'c', less by typing 'l', more by typing 'm'. Depending upon user's response, the computer should guess again. This is repeated till when the computer correctly guesses the number. A simple approach would be to start from 1 and keep on incrementing till the number is reached.

c) Can you make the program in b) part more intelligent, to reduce the number of attempts to make the right guess.

7.a) Write a program to print the binary representation of a given number.

Example for 13, your program should print-

1

1

0

1

b) Similarly write a program to print the octal representation

c) Similarly write a program to print the hexadecimal representation.