UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

COMPUTER SCIENCE DEGREE PROGRAMME

FIRST YEAR

SCS 1202 - Programming Using C

Lab Sheet 04

1. Write a C program to adding two numbers according to the user input. You should declare a separate function called **"addition ()"** to add two given user inputs.

2. Write a function (without parameters) that increments count by 1 and set it back to 0 when it reaches multiples of 9.

3. Write functions to compute the surface area and volume of a cube for a given length of a side.

4. Write a simple T20 cricket prediction program as follows. When you are given the current run rate(runs per over) and number of overs played, predict the projected score for current run rate and higher run rates of whole inning.(e.g. Current RR: 6.4 per over, Higher RR: 7 per over, 8 per over, 9 per over).

5. Write a C program to implement a game application that plays the children's game of rock, paper, and scissors. The user enters a letter, indicating a choice. Write a method to pick a value in the range of 1 through 3, with 1 corresponding to rock, 2 corresponding to paper, and 3 corresponding to scissors. The computer's choice is compared to the user's choice according to the rules: rock breaks scissors, scissors cut paper, paper covers rock. Choices that match are ties. Display whether user won, lost or match was tie. The application should end when the user enters an invalid choice.

6. Write a function to calculate nCr when n and r are given using following binomial coefficient rules.

   $^{n}C_{r} = {}^{n-1}C_{r} + {}^{n-1}C_{r-1}$

   $^{n}C_{0} = 1$

   $^{n}C_{n} = 1$

7. Write a program to calculate the date of birth from a given NIC number. Refer the following procedure.

- The first two characters show their birth year.
- The mid value(mid value means the 3rd, 4th and 5th character in that NIC no) shows their date and month. That means,
    - January: 31
    - February: 29
    - March: 31
    - April: 30.....etc

e.g.:- Someone born in 1995.06.15

Then his/her first two character of NIC no is 95.

The next three character calculate with their birth month and day, that means, **June 15**

Six months:

January, February, March, April, May, June
31 + 29 + 31 + 30 + 31 + 15 = **136**

Now the first five NIC no is 95**136**. If this is male NIC no is 95136. If this is female we add 500 with our normal calculation, (136+500=636) So that NIC number is 95636. Rest of the numbers is randomly generated.

8. Write a C function to compute the greatest common divisor (GCD) of two given numbers.

9. Write a function in C to sum the powers 2^n of all integers n between two given numbers a and b.

    E.g: If a = 5 and b = 8 Then sum = $5^2 + 6^2 + 7^2 + 8^2$

10. Write a recursive C function to get the following output regarding factorial.

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Factorial of 1: = 1
Factorial of 2: = 2
Factorial of 3: = 6
Factorial of 4: = 24
Factorial of 5: = 120
Factorial of 6: = 720
Factorial of 7: = 5040
Factorial of 8: = 40320
Factorial of 9: = 362880
Factorial of 10: = 3628800
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