**Assignment 5d:**

1. Write a C program to input any 15 numbers (including positive and negative).  
   Perform the following tasks:  
   (a) Count the positive numbers  
   (b) Count the negative numbers  
   (c) Sum of positive numbers  
   (d) Sum of negative numbers
2. Write a C program to calculate the sum of all odd numbers and even numbers between a range of numbers from m to n (both inclusive) where m < n. Input m and n (where m<n).
3. Write a C program to enter any 15 numbers and check whether they are divisible by 5 or not. If divisible then perform the following tasks:  
   (a) Display all the numbers ending with the digit 5.  
   (b) Count those numbers ending with 0 (zero).
4. Write a C program to display all the numbers between m and n input from the keyboard (where m<n, m>0, n>0), check and print the numbers that are perfect square. e.g. 25, 36, 49, are said to be perfect square numbers.
5. Write a C program to display all the 'Buzz Numbers' between p and q (where p<q). A 'Buzz Number' is the number which ends with 7 or is divisible by 7.
6. Write a C program to input marks in English, Maths and Science of 10 students who have passed ICSE Examination 2014. Now, perform the following tasks:  
   (a) Number of students, who have secured 95% or more in all the subjects.  
   (b) Number of students, who have secured 90% or more in English, Maths and Science.
7. Write a C program to input a number and count the number of digits. The program further checks whether the number contains odd number of digits or even number of digits.  
   Sample Input: 749  
   Sample Output: Number of digits=3  
                             The number contains odd number of digits.
8. Write a C program to input a number and display the new number after reversing the digits of the original number. The program also displays the absolute difference between the original number and the reversed number.  
   Sample Input: 194  
   Sample Output: 491  
   Absolute Difference= 297
9. Write a C program to find the GCD of two numbers. The Greatest Common Divisor (GCD) of two integers is calculated by the continued division method. Divide the larger number by the smaller, the remainder then divides the previous divisor. The process repeats unless the remainder reaches to zero. The last divisor results in GCD.  
   Sample Input: 45, 20  
   Sample Output: GCD=5
10. Write a C program to check whether a given number is palindrome or not.
11. Write a C program to check whether a given number is Armstrong number of order n or not.
12. Write a C program to calculate and display the factorial of a number.
13. Write a C program to check whether a given number is prime or not.
14. In order to reach the top of a pole, a monkey in his first attempt reaches to a height of 5 feet and in the subsequent jumps, he slips down by 2% of the height attained in the previous jump. The process repeats and finally the monkey reaches the top of the pole. Write a C program to input height of the pole. Calculate and display the number of attempts the monkey makes to reach the top of the pole.
15. Write a C program to input Principal (p), Rate (r) and Time (t). Calculate and display the amount, which is compounded annually for each year by using the formula:  
    Simple Interest (si) = (prt) / 100  
                                p = p + si  
    [**Hint**: The amount after each year is the Principal for the next year]
16. Write a C program to Write a menu driven program to input two positive numbers m and n (where m>n) and perform the following tasks:  
    (a) Find the sum of two numbers without using '+' operator.  
    (b) Find the product of two numbers without using '\*' operator.  
    (c) Find the quotient and remainder of two numbers without using '/' and '%' operator.

[**Hint**: The last value obtained after each subtraction is the remainder and the number of iterations results in quotient.]  
Sample Input: m=5, n=2  
5 - 2 =3  
3 - 2 = 1, thus Quotient = 2 and Remainder = 1

1. Write a menu driven C program to accept a number from the user and check whether it is a Palindrome or a Perfect number.  
   (a) Palindrome number: (A number is a Palindrome which when read in reverse order is same as in the right order)  
   **Example:** 11, 101, 151 etc.  
   (b) Perfect number: (A number is called Perfect if it is equal to the sum of its factors other than the number itself.)  
   **Example:** 6 = 1 + 2 + 3
2. Write a menu driven C program to accept a number from the user and check whether it is a Prime number or an Automorphic number.  
   (a) Prime number: (A number is said to be prime, if it is only divisible by 1 and itself)  
   **Example:** 3,5,7,11  
   (b) Automorphic number: (Automorphic number is the number which is contained in the last digit(s) of its square.)  
   **Example:** 25 is an Automorphic number as its square is 625 and 25 is present as the last two digits.
3. Write a menu driven C program to perform the following tasks by using Switch case statement:  
   (a) To print the series:  
   0, 3, 8, 15, 24, ............ to n terms. (value of 'n' is to be an input by the user)  
   (b) To find the sum of the series:  
   S = (1/2) + (3/4) + (5/6) + (7/8) + ........... + (19/20)
4. Using a switch statement, write a menu driven program to:  
   (a) Generate and display the first 10 terms of the Fibonacci series  
   0, 1, 1, 2, 3, 5  
   The first two Fibonacci numbers are 0 and 1, and each subsequent number is the sum of the previous two.  
   (b) Find the sum of the digits of an integer that is input.  
   Sample Input: 15390  
   Sample Output: Sum of the digits = 18  
   For an incorrect choice, an appropriate error message should be displayed.
5. A special two-digit number is such that when the sum of its digits is added to the product of its digits, the result is equal to the original two-digit number.  
   Example: Consider the number 59.  
                  Sum of digits = 5 + 9 = 14  
                  Product of digits = 5 \* 9 = 45  
                  Sum of the sum of digits and product of digits = 14 + 45 = 59  
   Write a program to accept a two-digit number. Add the sum of its digits to the product of its digits. If the value is equal to the number input, then display the message "Special 2 - digit number" otherwise, display the message "Not a special two-digit number".
6. Using switch statement, write a menu driven program to:  
   (a) find and display all the factors of a number input by the user ( including 1 and the excluding the number itself).  
   Example: Sample Input : n = 15  
                  Sample Output : 1, 3, 5  
   (b) find and display the factorial of a number input by the user (the factorial of a non-negative integer n, denoted by n!, is the product of all integers less than or equal to n.)  
   Example: Sample Input : n = 5  
                  Sample Output : 5! = 1\*2\*3\*4\*5 = 120  
   For an incorrect choice, an appropriate error message should be displayed.
7. Write a program to input a number. Check and display whether it is a Niven number or not. (A number is said to be Niven which is divisible by the sum of its digits).  
   Example: Sample Input 126  
   Sum of its digits = 1 + 2 + 6 = 9 and 126 is divisible by 9.
8. Write a program to accept a number and check whether it is a 'Spy Number' or not. (A number is spy if the sum of its digits equals the product of its digits.)  
   Example: Sample Input: 1124  
   Sum of the digits = 1 + 1 + 2 + 4 = 8  
   Product of the digits = 1\*1\*2\*4 = 8
9. Using switch statement, write a menu driven program for the following:  
   (a) To find and display the sum of the series given below:  
   S = x1 - x2 + x3 - x4 + x5 - ............ - x20; where x = 2  
   (b) To display the series:  
   1, 11, 111, 1111, 11111  
   For an incorrect option, an appropriate error message should be displayed.