**Introduction to Computing**

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| **Lab 7 Loop Practice File** | |
| **Topic** | **Loop Statement** |
| **Objective** | Learning how to use repetition statements. |

## Task 1

Write a C++ program which take a mark of student from user and also take Total marks, then the program able to find the student is pass or fail, the student will pass if the get above 50% Otherwise he is fail: The output on console given below

**Sample Output:**

|  |
| --- |
| Enter the Total marks: 150  Enter the obtained marks: 100  The percentage of obtain marks is 66% so the student is pass.  Enter the Total marks =100  Enter the obtained marks =34  The percentage of obtain marks is 34% so the student is fail. |

## Task 2

Write a C++ program which take a number from user you need to sum all even number and sum of all odd number till that number and also find which sum is Greater.

**Sample Output:**

|  |
| --- |
| Enter the Number: 20  Even Numbers are: 0 2 4 6 8 10 12 14 16 18 20  Sum of even number: 110  ODD Numbers are: 0 1 3 5 7 9 11 13 15 17 19  Sum of even number: 100  The Even sum is greater than Odd Sum |

## Task 3

Write a C++ program which take a number from user then the program able to find the number is palindrome or not:

**Sample Output:**

|  |
| --- |
| Enter the number: 1221  This is palindrome number  Enter the number: 5458  This is Not palindrome number |

## Task 4

Write a C++ program in which the user enters a number and you have to find sum of the digits of the number using while loop.

Expected Output:

|  |
| --- |
| Example: number is 4235  Output should be  Number is 4235  Digits of the number are 5, 3, 2 and 4  Digit sum for the number is 14 |

## Task 5

Write a C++ program the user enters a numberand you have to find sum of the square of every digit of the number using while loop.

Expected Output:

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| --- |
| **Example:**  Enter Number: 4235    **Output should be**  Digit is 5 its square is 25  Digit is 3 its square is 9  Digit is 2 its square is 4  Digit is 4 its square is 16  Square Digit sum for the number is 54 |

## Task 6

Write a C++ program the user enters a numberand You have to find which number is prime number.

***Prime number:*** *A number is prime if it is only divisible by one and itself and it has only two unique divisors*

Expected Output:

|  |
| --- |
| **Example:**  Enter Number: 17  **Output should be**  17 is the prime number |

## Task 7

Write a program in C++ to find the sum of the series 1 +11 + 111 + 1111 + .. n terms. Using for loop and while loop.

Sample Output:

**Expected Output**

|  |
| --- |
| Input number of terms: 5  1 + 11 + 111 + 1111 + 11111  The sum of the series is: 12345 |

## Task 8

Write a program in C++ to display the first n terms of the Fibonacci series using do while loop

**Expected Output**

|  |
| --- |
| Input number of terms to display: 10  Here is the Fibonacci series upto to 10 terms:  0 1 1 2 3 5 8 13 21 34 |

## Task 9

Write a program in C++ to find the LCM of any two numbers using HCF.

Expected Output:

|  |
| --- |
| Input 1st number for LCM: 15  Input 2nd number for LCM: 25  The LCM of 15 and 25 is: 75 |

## Task 10

Write a program in C++ to print the following series.

1 -4 7 -10 13 -16 …. -40

## Task 11

Write a program that inputs a number and checks whether it is a perfect number or not. A perfect number is a number that is numerically equal to the sum of its divisors.

For example, 6 is a perfect number because the divisors of 6 are 1,2,3 and 1+2+3 = 6

|  |
| --- |
| Enter a number: 6  6 is a perfect number |

## Task 12

Write a program to calculate and display the following series and then the sum of the following polynomial series using do while loop.

|  |
| --- |
| Enter a value of x : 2  Enter degree: 5  1 + 4 + 12 + 32 + 80 + 192 = 321 |

## Task 13

Write a program to calculate and display the following series and then the sum of the following series using while loop.

## Task 14

Write a C++ program that ask the user enters a numberand You have to find which number is Armstrong number.

***Armstrong number*** *is n digit number where the sum of nth power of its each digit is equal to the same n digit number.*

Keep in mind the number of digits in a number**.** Thus, an Armstrong number of three digit is that number in which the sum of the cubes of its digits is equal to the number itself.

**Example:** 371 a 3-digit number, where sum of 3^3 + 7^3+1^3 = 27 + 343 + 1 = 371

Thus, an Armstrong number of four digit is that number in which the sum of the fourth power of its digits is equal to the number itself.

**Example:** 1634 a 4-digit number, where sum of

1^4 + 6^4 + 3^4 + 4^4 = 1 + 1296 + 81 + 256 = 1634

Expected Output:

|  |
| --- |
| Enter number: 1634  Number is 1634 and [256 + 81 + 1296 + 1 = 1634] it is an Armstrong number |
| Enter number: 1632  Number is 1632 and [16 + 81 + 1296 + 1 != 1632] it is not an Armstrong number |

## Task 15

Write a C++ program that the user to enters a numberand You have to find all the positive divisors of every number and count the number of divisors of that number.

*A* ***positive divisor*** *of a number, is a number that divides the number completely and remainder is zero*

Expected Output:

|  |
| --- |
| Enter number: 120  **Output should be**  Divisors of 120 are 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60 and 120  Total number of divisors of 120 are 16 |

## Task 16

Write a C++ program that ask the user to enters a numberand You have to find which numbers are Strong numbers

**Strong** numbers are the numbers whose sum of factorial of digits is equal to the original **number**

Example: number is 145, so 1! + 4! + 5! = 1 + 24 + 120 = 145

Expected Output:

|  |
| --- |
| Enter number: 145  **Output should be**  Digit is 5 its factorial is 120  Digit is 4 its factorial is 24  Digit is 1 its factorial is 1  Digits Factorial sum is 145, so 145 is a strong number |

## Task 17

Write a C++ program that ask the user to enters a numberand You have to find binary equivalent for every number

Expected Output:

|  |
| --- |
| Enter number: 145  **Output should be**  Number is 145 and its binary equivalent is 10010001 |