

## LAB MANUAL 07

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### LOOPS AND NESTED LOOPS

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C++ programming language provides the following type of loops to handle looping requirements.

Sr.no.	Loop type and description
1	<b>For loop</b> Execute a sequence of statements multiple times and abbreviates the code that manages the loop variable.
2	<b>While loop</b> Repeats a statement or group of statements while a given condition is true. It tests the condition before executing the loop body.
3	<b>Do while loop</b> Like a 'while' statement, except that it tests the condition at the end of the loop body.

#### Question#01

Write a C++ program to input an upper bound by user and print all numbers up to that limit?

#### Question#02

Write a C++ program to input an upper bound and separate even & odd from that limit?

#### Question #03

Write a C++ program that prints complete alphabets using for loop? (a-z)

#### Question #04

Write a C++ program that ask the user a number and prints the table of that number up to 10?

#### Question #05

Write a C++ program that displays the product of all odd numbers from 1 to 10 using for loop?

#### Question #06

Write a C++ program that finds the sum of squares of integer from 1 to n. Where n is a positive value entered by user (i.e.  $1^2 + 2^2 + 3^2 \dots \dots \dots + n^2$ ).

#### Question #07

Write a C++ program counts the number of digits in the number entered by user?

#### Question # 08

Write a C++ program to reverse a number entered by user using loop.

#### Question # 09

Write a program to find first and last digit of a number.

#### Question # 10

Write a program to calculate product of digits of a number.

#### Question # 11

Write a program to find frequency of each digit in a given integer.

#### Question # 12

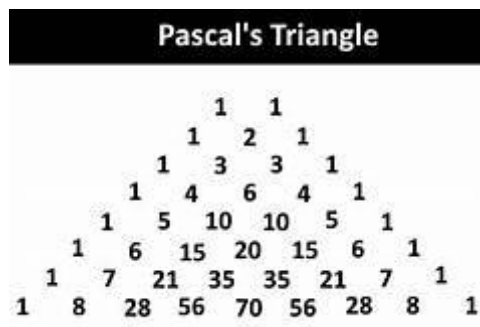
Write a program to check whether a number is Armstrong number or not.

#### Question # 13

Write a program to convert Binary to Decimal number system.

#### Question # 14

Write a program to print Pascal triangle upto n rows.



#### Question # 15

Write a program to print following patterns by using nested loops.

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```

    *****
   *****
  *****
 *****

```

### Rhombus Star Pattern

```

    *****
   *      *
  *      *
 *      *
*      *
*****

```

### Hollow Rhombus Star Pattern

```

*****
*****
*****
*****
*****

```

### Mirrored Rhombus Star Pattern

```

*****
 *      *
 *      *
 *      *
 *      *
*****

```

### Hollow Mirrored Rhombus Star Pattern

```

*
**
***
****
*****

```

### Right Triangle Star Pattern

```

*
**
* *
* *
*****

```

### Hollow Right Triangle Star Pattern

```

      *
     **
    ***
   ****
  *****

```

### Mirrored Right Triangle Star Pattern

```

      *
     **
    *  *
   *  *
  *****

```

### Hollow Mirrored Right Triangle Star Pattern

```

*****
****
***
**
*

```

### Inverted Right Triangle Star Pattern

```

*****
*   *
*  *
**
*

```

### Hollow Inverted Right Triangle Star Pattern

```

*****
****
***
**
*

```

### Inverted Mirrored Right Triangle Star Pattern

```

*****
*   *
*  *

```

```

**
 *
```

### Hollow Inverted Mirrored Right Triangle Star Pattern

```

  *
 ***
*****
*****
*****
*****
```

### Pyramid Star Pattern

```

  *
 * *
*   *
 *   *
*     *
*****
```

### Hollow Pyramid Star Pattern

```

*****
*****
*****
*****
*****
  *
```

### Inverted Pyramid Star Pattern

```

*****
 *   *
 *   *
 *   *
 *   *
  *
```

### Hollow Inverted Pyramid Star Pattern

```

*
**
***
****
*****
*****
****
***
**
*
```

### Half Diamond Star Pattern

```

      *
     **
    ***
   ****
  *****
 *****
  *****
   ****
    ***
     **
      *

```

### Mirrored Half Diamond Star Pattern

```

      *
     ***
    *****
   *****
  *****
 *****
  *****
   *****
    *****
     *****
      *

```

### Diamond Star Pattern

```

*****
*****  *****
***      ***
**        **
*          *
*          *
*          *
**        **
***      ***
*****  *****
*****

```

### Hollow Diamond Star Pattern

```

*****
 *   *
  *   *
   *   *
    *   *
     *
    *   *
   *   *
  *   *
 *   *
*****

```

\*\*\*\*\*

### Right Arrow Star Pattern

```

      *****
     *****
    *****
   *****
  *****
 *****
*****
*****

```

### Left Arrow Star Pattern

```

      +
      +
      +
      +
+++++++
      +
      +
      +
      +

```

### Plus Star Pattern

```

 *           *
 *         *
 *       *
 *     *
 *   *
 * *
 *
 *   *
 *     *
 *       *
 *         *
 *           *

```

### X Star Pattern

