

# Lab Task 8

**Topic :** Nested Loops

## Task # 1

Write C++ programs to draw the following patterns:

1. For N = 4

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

2. For N = 4

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

3. For N = 4

```

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

```

**Note:** All the codes **Must** be Generic, i.e should work for any given input.

## Task # 2

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Write a C++ program to calculate the value of **sin** upto N terms using the following series.

$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}$$

## Task # 3

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Write a C++ program to reverse any given number.

**Note:** Program Must be generic,