1. **x** and **n** are input through keyboard. Write a program to compute x^n , $n!$, ^nC_r , ^nP_r
2. Write a program to determine the **GCD** (greatest common divisor) and **LCM** (least common multiple) of 3 numbers.
3. Find out the sum of each of the following series. n is the input from user for series (iv) to (vi)
    - (i) $3 + 11 + 19 + \ldots + 1691$.
    - (ii) $7 + 20 + 33 + \ldots$ (up to 100 th term)
    - (iii) $5 - 11 + 17 - \ldots$ (up to 75 th term)
    - (iv) $1 + (1 + 2) + (1 + 2 + 3) + \ldots + (1 + 2 + 3 + \ldots + n)$
    - (v) $1 + \dfrac{2^2}{2!} + \dfrac{3^2}{3!} + \ldots + \dfrac{n^2}{n!}$
    - (vi) $2 * 7 * 12 * \ldots * 37$
4. Write a program to determine all **prime numbers** within the range **[a …b]** where **a** & **b** are input through keyboard.
5. Construct the following table. Here **n** is input from the user.

1	2	3	…	n
2	4	6	…	2n
3	6	9	…	3n
.	.	.	…	.
.	.	.	…	.
.	.	.	…	.
n	2n	3n	…	nn

6. Write a program to find out first n **perfect number** where **n** is the input from user.
7. Write a program to find first n **Fibonacci number** where **n** is the input from user.
8. Write a program to show the following triangle/rectangle of '*'s or numbers. Take **n** as input from user to determine the number of rows of the structure. (eg: n = 5)

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


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


        1
       1 2 1
      1 2 3 2 1
```

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```
      1 2 3 4 3 2 1
    1 2 3 4 5 4 3 2 1

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

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

    1 2 3 2 1
    1       1
    1       1
    1       1
    1 2 3 2 1

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

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

            1
          1 2 1
        1 2 3 2 1
```

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```
        1 2 3 4 3 2 1
      1 2 3 4 5 4 3 2 1
        1 2 3 4 3 2 1
          1 2 3 2 1
            1 2 1
              1

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

      1 2 3 4 5 4 3 2 1
        1 2 3 4 3 2 1
          1 2 3 2 1
            1 2 1
              1
            1 2 1
          1 2 3 2 1
        1 2 3 4 3 2 1
      1 2 3 4 5 4 3 2 1
```

9. Write a program to print out all **Armstrong numbers** between 1 and 10000. If sum of cubes of each digit of the number is equal to the number itself, then the number is called an Armstrong number. For example, 153 = (1*1*1) + (5*5*5) + (3*3*3).

10. Write a program to calculate how many 5 digit numbers can be created if the following terms apply :
    (i)   the leftmost digit is even
    (ii)   the second digit is odd
    (iii)   the third digit is a non even prime
    (iv)   the fourth and fifth are two random digits not used before in the number.

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