Programming Assignment-5

(Iterative Statements/Looping)

1. Write a program that gets three integers from the user. Count from the first number to the second number in increments of the third number. A sample execution is given below:

   from: 5

   to: 18

   step by: 2

   Output: 5 7 9 11 13 15 17

2. Find output:

a)

```
number = 72958476
a, b = 0, 0
while (number > 0):
    digit = number % 10
    if(digit % 2 != 0):
        a += digit
    else:
        b += digit
    number /= 10
    print(a,b)
```

b)

```
total = 0
N = 5
for i in range(1, N+1):
  for j in range(1, N+1):
     total += i
print(total)
```

```
c)for i in range(1, 6,7):
        print(i)
```

```
d)for i in range(1, 6):
        print(i)
```

```
e)for i in range(6):
        print(i)

f)for i in range(2,6):
        print(i)

g)for i in range(7,6):
        print(i)

h)for i in range(5, 0, -1):
        print(i)

i)result = 1
   for i in range(1, 4):
      result *= i
   print(result)

j)for i in range(20,1):
      print(i)

k)for i in range(20,10,-1):
       print(i)

l)for i in range(20,-1,-1):
         print(i)

m)for i in range(1, 6):
      if i % 2 == 0:
          continue
      print(i, end=" ")
n)for i in range(1, 6):
      if i % 2 == 0:
          break
      print(i, end=" ")

o)for i in range(1, 6):
      if i % 2 == 0:
          pass
      print(i, end=" ")
```

3. Write a program that prints the integers from1,000 to 2,000 with five integers per line.

4. If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6 and 9. The sum of these multiples is 23. Write a program to find the sum of all the multiples of 3 or 5 below a user entered number N.

5. Write a program to print the following pattern using nested loops.

6. Write a program to print the following pattern using nested loops.

```
* * * * * * * * * * 1
* *   *   *   *   * 2
*   *     *     *   3
* *   *       *     4
*       *         * 5
* * *     *         6
*           *       7
* *   *       *     8
*   *           *   9
* *     *         * 10
```

7. Write a program to compute the harmonic mean. The harmonic mean is defined by

$$H = \frac{n}{\sum_{i=1}^{n} (1/a_i)}$$

8. Write a program to compute the sum of the first n terms (n>=1) of the series.

S=1-3+5-7+9- ……

9. Input a number n, write a program to compute n factorial (written as n!) where n>=0.

10. For a given x and a given n, write a program to compute $x^n/n!$.

11. Write a program to generate and print the first n terms of the Fibonacci sequence where n>=1. The first few terms are: 0, 1, 1, 2, 3, 5, 8, 13, ...

12. Write a program to generate and print the first n terms of the following sequence where n>=1. The first few terms are: 1, 2, 3, 6, 11, 20, 37, ...

13. Write a program that accepts a positive integer n and reverses the order of its digits.

14. Write a program that puts the binary representation of a positive integer N into aString s.

15. Write a program GCD that finds the greatest common divisor (gcd) of two integers using Euclid's algorithm, which is an iterative computation based on the following observation: if x is greater than y, then if y divides x, the gcd of x and y is y; otherwise, the gcd of x and y is the same as the gcd of x % y and y.

16. Write a program to find the sum of the first n terms of the series fs=0!+1!+2!+3!+…+n! (n>=0)

17. Write a program to find the sum of the first n terms of the series $s=x^1/1!+x^2/2!+x^3/3!+\ldots$.

18. Write a program to find the sum of the first n terms of the series $s=x-x^3/3!+x^5/5!-x^7/7!+\ldots$.

19. Write a program to compute the sum of the digits in an integer.

20. A perfect number is one whose divisors add up to the number. Example: The first perfect number is 6, because 1, 2, and 3 are its proper divisors, and 1+2+3=6.
Write a program that prints all perfect numbers in between 1 and 500.