IDC101-Introduction to computers (Python programming)

Lab tasks – **Session 06**   December 19-20 2022

- Name your Colab sheet as rollNo-WS-No.ipynb (for example, if you are making colab sheet for WS6 then it should be named as: rollNo-WS-06.ipynb)

Learn to use:
- Practice *continue, and break* statements in while/for loop. Using *break* to modify program to determine whether a number is prime or not.
- Use *for….else* and *while …. else* statements.
- Writing *function* for adding numbers, finding a number is odd/even

```python
def sum(a,b):
  sum=a+b
  return(sum)
print(sum(10,5))
## you can embed a function within a function
print(sum(sum(2,4),sum(9,10)))

def isOdd(a):
  if a%2 == 0:
    return (True)
  else:
    return (False)
print(isOdd(3))
print(isOdd(4))
```

- Dealing with datatype **list**

```python
exList=[2,3,'to',101,'idc101',89,91,'welcome']
print(exList[2],exList[4][2:])
print(exList[7],exList[2],exList[4])
print(len(exList))

exList.append(98) ## adds to the end of list
print(exList)
print(exList.index('idc101')) # returns 4
```

Q 1. Write a program to print nth prime number starting by using:
  - a. *break* statement.
  - b. Write a function to determine if a number is prime.

Q 2. Find sum of odd numbers from 0 till 100 (Using <u>continue</u> statement).

Q 3. Find sum of first n prime numbers.

Q 4. Write a program to find whether an input WORD has following properties:
  - a. The string length is at least 8 characters long.
  - b. String contains at least 1 numeric character.
  - c. String contains at least 1 capital alphabet.
  - d. String contains at least 1 special character (NOT numeric/alphabet/space).

Q 5.   The collatz conjecture states that "For any positive integer repeating two simple arithmetic operations to obtain next number, **viz.** *if number (n) is even, then next number is n/2 else the next number is (3n+1)/2*, will eventually transform the input integer into 1. The sequence of numbers obtained is called hailstone numbers. Write a function to check collatz conjecture. Find the number of steps required to convert a number to 1 and maximum number obtain during the process.

    Input integer n

    If n is even:

      $(n+1)^{th}=n/2$

    Else:

      $(n+1)^{th}=(3*n+1)/2$

Q 6.   Write a program to find the occurrence of unique character in the string given below (Make a **list** of these unique characters). For each entry in this list, find occurrence of characters. Now make a unique **list** of overlapping two consecutive characters and find their occurrences. Generalize this using a function for any n consecutive characters.

```
seq='accttcagacttgggaagattggcatcttcgccaccgggtactcggcccacggctcctcc
tgacacgtatagtcactctagtgccaacgagttatttccgccgatgtatgagatacaagaactgAACGCTC
CtgcttatggggGCAGGTgacgaaagcttctaccagtcttctttgttagtaagggcacactttgtcgcccc
agcacgcatgcccactggtagcatgccgtagatcaatagcctttctcttgttgttagtaagggcacacttt
gtcgccccagcacgcatgcccactggtagcatgccgtagatcaatagcctttctcttg'
```