LOOPS AND STATEMENTS

1. Write a program to print the following number pattern using a loop.

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

2. Write a program to accept a number from a user and calculate the sum of all numbers from 1 to a given number
3. Write a program to print multiplication table of a given number
4. Write a program to count the total number of digits in a number using a while loop.

   For example, the number is 75869, so the output should be 5.

5. Write a program to use the loop to find the factorial of a given number.
6. Write a python program to find the sum of all even numbers from 0 to 10
7. Write a python program to read three numbers (a,b,c) and check how many numbers between ‘a’ and ‘b’ are divisible by ‘c
8. Write a python program to read radius of a circle and print the area
9. Write a python program to read a number ,if it is an even number , print the square of that number and if it is an odd number print a cube of that number.
10. Write a python program to read two numbers and find the sum of their cubes
11. Given two integer numbers return their product only if the product is greater than 1000, else return their sum.
12. Write a program to iterate the first 10 numbers and in each iteration, print the sum of the current and previous number.
13. Write a program to accept a string from the user and display characters that are present at an even index number.(Try to create one solution with for loop and another solution using list)
14. Write a program to remove characters from a string starting from zero up to n and return a new string.
15. Write a function to return True if the first and last number of a given list is the same. If numbers are different then return False.
16. Iterate the given list of numbers and print only those numbers which are divisible by 5

17. Write a program to check if the given number is a palindrome number. A palindrome number is a number that is the same after reverse. For example 545, is the palindrome numbers
18. Given a two list of numbers, write a program to create a new list such that the new list should contain odd numbers from the first list and even numbers from the second list.
19. Write a Program to extract each digit from an integer in the reverse order. For example, If the given int is **7536**, the output shall be "**6 3 5 7**", with a space separating the digits.
20. Display numbers from -10 to -1 using for loop

PYTHON DATA STRUCTURES

LIST:

1. Consider a list of x values and reverse the list
2. Consider two list with a collection of string in each list and concatenate two lists index-wise and create a new list (*hint : use zip function)*
3. Given a Python list of numbers. Turn every item of a list into its square
4. Concatenate two lists in the following order

```
list1 = ["Hello ", "take "]
list2 = ["Dear", "Sir"]

OUTPUT:
['Hello Dear', 'Hello Sir', 'take Dear', 'take Sir']
```

5. Given a Python list, remove all occurrence of 20 from the list
6. Given a Python list, find value 20 in the list, and if it is present, replace it with 200. Only update the first occurrence of a value
7. Given a nested list extend it by adding the sub list ["h", "i", "j"] in such a way that it will look like the following list

```
list1 = ["a", "b", ["c", ["d", "e", ["f", "g"], "k"], "l"], "m", "n"]

Sub List to be added = ["h", "i", "j"]

Expected output:

['a', 'b', ['c', ['d', 'e', ['f', 'g', 'h', 'i', 'j'], 'k'], 'l'], 'm', 'n']
```

8. Add item 7000 after 6000 in the following Python List

```
list1 = [10, 20, [300, 400, [5000, 6000], 500], 30, 40]

OUTPUT:
[10, 20, [300, 400, [5000, 6000, 7000], 500], 30, 40]
```

9. Remove empty strings from the list of strings

```
list1 = ["Mike", "", "Emma", "Kelly", "", "Brad"]

OUTPUT:
["Mike", "Emma", "Kelly", "Brad"]
```

DICTIONARY:

1. Below are the two lists convert it into the dictionary

```
keys = ['Ten', 'Twenty', 'Thirty']
values = [10, 20, 30]

OUTPUT:
{'Ten': 10, 'Twenty': 20, 'Thirty': 30}
```

2. Merge following two Python dictionaries into one

```
dict1 = {'Ten': 10, 'Twenty': 20, 'Thirty': 30}
dict2 = {'Thirty': 30, 'Fourty': 40, 'Fifty': 50}

OUTPUT:
{'Ten': 10, 'Twenty': 20, 'Thirty': 30, 'Fourty': 40, 'Fifty': 50}
```

3. Access the value of key ‘history’ from the below dict

```
sampleDict = {
  "class":{
    "student":{
      "name":"Mike",
      "marks":{
        "physics":70,
        "history":80
      }
    }
  }
}

OUTPUT:
80
```

4. Create a new dictionary by extracting the following keys from a below dictionary

```
sampleDict = {
  "name": "Kelly",
  "age":25,
  "salary": 8000,
  "city": "New york"
}
keys = ["name", "salary"]

OUTPUT:
{'name': 'Kelly', 'salary': 8000}
```

5. Delete set of keys from a dictionary

```
sampleDict = {
  "name": "Kelly",
  "age":25,
  "salary": 8000,
  "city": "New york"

}
keysToRemove = ["name", "salary"]

OUTPUT:
{'city': 'New york', 'age': 25}
```

6. Rename key city to location in the following dictionary

```
sampleDict = {
  "name": "Kelly",
  "age":25,
  "salary": 8000,
  "city": "New york"
}

Expected output:
{
  "name": "Kelly",
  "age":25,
  "salary": 8000,
  "location": "New york"
}
```

7. Get the key of a minimum value from the following dictionary

```
sampleDict = {
  'Physics': 82,
  'Math': 65,
  'history': 75
}

Expected output:
Math
```

8. Change Brad's salary to 8500 from a given Python dictionary

```
sampleDict = {
    'emp1': {'name': 'Jhon', 'salary': 7500},
    'emp2': {'name': 'Emma', 'salary': 8000},
    'emp3': {'name': 'Brad', 'salary': 6500}
}

Expected output:
sampleDict = {
    'emp1': {'name': 'Jhon', 'salary': 7500},
    'emp2': {'name': 'Emma', 'salary': 8000},
    'emp3': {'name': 'Brad', 'salary': 8500}
}
```

TUPLE:

1. Access value 20 from the following tuple

```
aTuple = ("Orange", [10, 20, 30], (5, 15, 25))

Expected output:
20
```

2. Unpack the following tuple into 4 variables

```
aTuple = (10, 20, 30, 40)
```

Expected output:
aTuple = (10, 20, 30, 40)

print(a) # should print 10
print(b) # should print 20
print(c) # should print 30
print(d) # should print 40

3. Swap the following two tuples

tuple1 = (11, 22)
tuple2 = (99, 88)

Expected output:
tuple1 = (99, 88)
tuple2 = (11, 22)

4. Copy element 44 and 55 from the following tuple into a new tuple

tuple1 = (11, 22, 33, 44, 55, 66)
Expected output:

tuple2: (44, 55)

5. Modify the first item (22) of a list inside a following tuple to 222

tuple1 = (11, [22, 33], 44, 55)
Expected output:

tuple1: (11, [222, 33], 44, 55)

6. What's the index of 2? In the given tuple

Tuple_sample =(55, 777, 54, 6, 76, 101, 1, 2, 8679, 123, 99)

7. What is the sum, min and max of all the numbers in the tuple?

Tuple_sample =(42, 1092, 11, 88, 65, 2, 6)

SET:

1. Add a list of elements to a given set

```
sampleSet = {"Yellow", "Orange", "Black"}
sampleList = ["Blue", "Green", "Red"]

Expected output:
{'Green', 'Yellow', 'Black', 'Orange', 'Red', 'Blue'}
```

2. Return a new set of identical items from a given two set

```
set1 = {10, 20, 30, 40, 50}
set2 = {30, 40, 50, 60, 70}

Expected output:
{40, 50, 30}
```

3. Returns a new set with all items from both sets by removing duplicates

```
set1 = {10, 20, 30, 40, 50}
set2 = {30, 40, 50, 60, 70}

Expected output:
{70, 40, 10, 50, 20, 60, 30}
```

4. Given two Python sets, update the first set with items that exist only in the first set and not in the second set.

```
set1 = {10, 20, 30}
set2 = {20, 40, 50}

Expected output:
set1 {10, 30}
```

5. Remove items 10, 20, 30 from the following set at once

```
set1 = {10, 20, 30, 40, 50}

Expected output:
{40, 50}
```

STRINGS:

1. Check if “is” present in the given string.
   String = “this is a sample Data”
2. Create a new string from the above string by removing “Data”.
3. Display date, month and year from “15-Nov-2021”
4. Display ‘sample’ word from ‘ this is another sample string ‘
5. We have an array of values = “10,20,30,40,50,60,70”, get “50,60”
6. Find the sum of elements arr = “10,20,30,40,50,60,70”
7. From the given string From credit_str = “1234-5678-9878-0434” print ‘0’
8. From the given list calculate total scores.
   student_scores =[‘Alex|75 50 90 80 90 70’,
   ‘Mary|76 72 71 68 85 69’,
   ‘John|69 67 68 71 68 67’,
   ‘Anne|80 69 59 82 71 81’,
   ‘Mark|79 81 74 71 69 73’
   ]
9. Calculate the sum and average of the digits present in a string (ex : “lasya253@21658922”)
10. Remove all characters from a string except integers(Ex : str1 = 'I am 25 years and 10 months old', output : 2510)

FUNCTIONS:

1. Create a function with variable length of arguments and prints the output.
2. Create a function which returns multiple arithmetic results of two inputs.
3. Create an inner function to calculate the addition in the following way
   a. Create an outer function that will accept two parameters, a and b
   b. Create an inner function inside an outer function that will calculate the addition of a and b
   c. At last, an outer function will add 5 into addition and return it

4. Write a program to create a recursive function to calculate the sum of numbers from 0 to 10.
5. Assign a different name to function and call it through the new name
6. Create 4 functions which accepts
    a. Positional arguments
    b. Keyword arguments
    c. Default arguments
    d. Variable-length Arguments

ERROR HANDLING:

1. Create the below errors by writing some code
    a. NameError
    b. SyntaxError
    c. TypeError
    d. IndexError
    e. KeyError
    f. AttributeError
    g. ValueError
2. Create a calculator which accepts operands and operators and generates the output respectively. Handle the possible errors that can be generated in the code.