1. **Write a program to demonstrate different number data types in Python.**

- **Program :-**

```
a = 10
b = 12.5
c = "ZUBAIR"
d = 2 + 3j
e = (1, 2, 3, 4, 5)
f = [11, 22, 33]
g = {1: 'Azhar',2 :' Sameer',3:'Zubair'}
h = True
i = {1, 2, 3, 4, 5}

print("Integer : ",type(a))
print("Float : ",type(b))
print("String : ",type(c))
print("Complex : ",type(d))
print("Tuple : ",type(e))
print("List : ",type(f))
print("Dictionary : ",type(g))
print("Boolean : ",type(h))
print("Set : ",type(i))
```

- **Output :-**

```
Integer :  <class 'int'>
Float :  <class 'float'>
String :  <class 'str'>
Complex :  <class 'complex'>
Tuple :  <class 'tuple'>
List :  <class 'list'>
Dictonary :  <class 'dict'>
Boolean :  <class 'bool'>
Set :  <class 'set'>
```

2. **Write a python script to print the current date in the following format "Sun May 29 02:26:23 IST 2017".**

- **Program :-**

```
import time
ltime=time.localtime()
print(time.strftime("%A %B  %D %H: %M: %S %Z %Y",ltime))
```

- **Output :-**

```
Friday March  03/07/25 21: 30: 46 India Standard Time 2025
```

3. **Write a Python program to construct the following pattern, using a nested for loop.**

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

- **Program :-**

```
rows = 5
for i in range(1, rows + 1):
    for j in range(i):
        print('*', end='')
    print()

for i in range(rows - 1, 0, -1):
    for j in range(i):
        print('*',end='')
    print()
```

- **Output :-**

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

4. **Write a program to perform different Operators in python.**

- **Program :-**

```
a = int(input("Enter first number :" ))
b = int(input("Enter second number :" ))

print("a + b = ",a+b)
print("a - b = ",a-b)
print("a * b = ",a*b)
print("a / b = ",a/b)
print("a % b = ",a%b)
```

- **Output :-**

```
Enter first number : 10
Enter second number : 20
a + b = 30
a - b = -10
a * b =  200
a / b =  0.5
a % b =  10
```

5. Write a Python program to convert temperatures to and from Celsius, Fahrenheit. [Formula: c/5 = f-32/9].

- **Program :-**

```
Calsious = float(input("Enter the Temperature in Celsius : "))
f = (Calsious * 1.8) + 32
print("Temperature in Fahrenheit : ",f)
```

- **Output :-**

```
Enter the Temperature in Celsius : 1
Temperature in Fahrenheit :  33.8
```

6. Find the largest and smallest numbers in a list.

- **Program :-**

```
Numbers = [12, 34, 5, 56, 100, 44]

smallest = min(Numbers)
largest = max(Numbers)

print("Smallest number in the list : ",smallest)
print("Largest number in the list : ",largest)
```

- **Output :-**

```
Smallest number in the list :  5
Largest number in the list :  100
```

7. Create a dictionary to store student names and their marks; display them.

- **Program :-**

```
students = {}

num_students=int(input("Enter the number students : "))
for i in range(num_students):
    name=input("Enter the name of student : ")
    marks=float(input("Enter the marks of student : "))
    students[name]=marks
print("Student name and marks")
for name, marks in students.items():
    print(f"{name}: {marks}")
```

- **Output :-**

```
Enter the number students : 1
Enter the name of student : Praful Patil
Enter the marks of student : 87.36

Student name and marks
Praful Patil: 87.36
```

8. Write a function to calculate the factorial of a number.

- **Program :-**

```
n = int(input("Enter the Number : "))
def fact(n):
    f = 1
    for i in range(1, n+1):
        f = f * i
    return f
print("Factorial : ",fact(n))
```

- **Output :-**

```
Enter the Number : 5
Factorial :  120
```

9. Write a program to create, append, and remove lists in python.

- **Program :-**

```
print("Create list")
fruit=["Apple","Banana","Papaya"]
print(fruit)

print("\n Append one or more items in list")
fruit.append("Orange" "Cherry")
print(fruit)

print("\n Remove item in list")
fruit.remove("Banana")
print(fruit)
```

- **Output :-**

```
Create list
['Apple', 'Banana', 'Papaya']

 Append one or more items in list
['Apple', 'Banana', 'Papaya', 'OrangeCherry']

 Remove item in list
['Apple', 'Papaya', 'OrangeCherry']
```

10. Write a program to demonstrate working with tuples in python.

- **Program :-**

```
tup1 = (10, 20, 30, 40, 5, 100)
```

```
tup2 = (11, "Praful", 20.5, 'a')
tup3 = tup1 + tup2 # concatenate(+)
print("tup1 is : ",tup1)
print("tup2 is : ",tup2)
print("tup3 is : ",tup3)
print("Using replicate Operator : ",tup1 * 3) #replicate(*)
print("Largest element in tup1 is : ",max(tup1)) #max()
print("Smallest element in tup1 is : ",min(tup1)) #min()
print("Length of tup1 is : ",len(tup1)) #len()
print("Using tuple function : ",tuple(tup1)) #tuple()
```

- **Output :-**

```
tup1 is :  (10, 20, 30, 40, 5, 100)
tup2 is :  (11, 'Praful', 20.5, 'a')
tup3 is :  (10, 20, 30, 40, 5, 100, 11, 'Praful', 20.5, 'a')
Using replicate Operator :  (10, 20, 30, 40, 5, 100, 10, 20, 30, 40, 5, 100, 10, 20, 30,
                             40, 5, 100)
Largest element in tup1 is :  100
Smallest element in tup1 is :  5
Length of tup1 is :  6
Using tuple function :  (10, 20, 30, 40, 5, 100)
```

11. Demonstrate the following control transfer statements in Python with suitable examples. i) break ii) continue iii) pass

- **Program :-**

```
print("Break Statement")
```

```
for number in range(1, 5):
    if number == 3:
        break
    print(number)

print("Continue Statement")
for number in range(1, 5):
    if number == 2:
        continue
    print(number)

print("Pass Statement")
for number in range(1, 5):
    if number == 4:
        pass
    print(number)
```

- **Output :-**

```
Break Statement
1
2
Continue Statement
1
3
4
Pass Statement
1
2
3
4
```

12. Demonstrate the working of following functions in Python.

i) id( ), ii)type( ), iii) range( )

- **Program :-**

```
print("i) Using Id() Function")
names_tuple = ('Chirag', 'Kshitiz', 'Dinesh', 'Kartik')
```

```
print(id(names_tuple))

print("ii) Using range() Function")
for i in range (1,5):
    print(i,end=" ")
    print()

print("iii) Using type() Function")
x=10
y=5.2
print(type(x))
print(type(y))
```

- **Output :-**

```
i) Using Id() Function
1234732776672

ii) Using range() Function
1
2
3
4

iii) Using type() Function
<class 'int'>
<class 'float'>
```

13. Write a Python script that prints prime numbers less than 20.

- **Program :-**

```
for num in range(1, 20):
    if num>1:
        for i in range(2, num):
```

```
            if num % i == 0:
                break;
        else:
            print(num)
```

- **Output :-**

```
2
3
5
7
11
13
17
19
```

14. Define a function in python that accept number and checks whether number is even or odd.

- **Program :-**

```
num = int(input("Enter the Number : "))
def even(num):
    if(num % 2 == 0):
        print("Number is Even")
    else:
        print("Number is Odd")
even(num)
```

- **Output :-**

```
Enter the Number : 50
Number is Even

Enter the Number : 55
Number is Odd
```

15. Python program to check whether a given year by user, is a leap year Or not.

- **Program :-**

```
Year = int(input("Enter the Year : "))
if(Year / 400 == 0) and (Year % 100 == 0):
    print("This is Leap Year")
```

```
elif(Year % 4 == 0) and (Year % 100!= 0):
   print("This is Leap Year")
else:
   print("This is not Leap Year")
```

- **Output :-**

```
Enter the Year : 2024
This is Leap Year

Enter the Year : 2025
This is not Leap Year
```

16. Write a python program to define a module to find Fibonacci Numbers and import the module to another program.

- **Program :-**

```
def Fibonacci(n):
   a = 0
   b = 1
   print("Fibonacci series : ",end =" ")

   for _ in range(n):
      print(a, end = " ")
      a, b = b, a + b
# The Program name is Fibonacci.py


import Fibonacci

num = int(input("Enter the number of terms: "))
Fibonacci.Fibonacci(num)
```

- **Output :-**

```
Enter the number of terms: 5
Fibonacci series :  0 1 1 2 3
```

17. Write a python program to define an arithmetic module and import a specific function in that module to another program.

- **Program :-**

```
def add(x,y):
    return x + y
def sub(x, y):
```

```
    return x - y
def prod(x, y):
    return x * y
def div(x, y):
    return x / y
#The Program name is Arithematic.py

import Arithmetic
a = 10
b = 20
addition =Arithmetic.add(a,b)
print("Addition of 10 and 20 is : ",addition)
```

- **Output :-**

```
Addition of 10 and 20 is :  30
```

18. Write a program to check the given character is alphabet or not.

- **Program :-**

```
ch = input("Enter the Alphabet : ")
if(ch <= 'Z' and ch >= 'A') or (ch <= 'z' and ch >= 'a'):
   print("This is Alphabet")
else:
   print("This is not Alphabet")
```

- **Output :-**

```
Enter the Alphabet : a
This is Alphabet

Enter the Alphabet : Q
This is Alphabet

Enter the Alphabet : 12
This is not Alphabet
```

19. Write a python program to implement math module (implement any 5 Function).

- **Program :-**

```
import math

def Square_root():    #1
   num = 25
```

```
    return math.sqrt(num)
print("1.  Square root of 25 : ", Square_root())

def Factorial():  #2
    num = 5
    return math.factorial(num)
print("2.  Factorial of 5 : ", Factorial())

def Power():  #3
    return math.pow(2, 3)
print("3.  The Power is : ", Power())

def Radians():   #4
    return math.radians(45)
print("4.  45 Degree to Radian : ", Radians())

def Log():    #5
    num = 100
    return math.log(num, 10)
print("5.  Log of 100 : ",Log())
```

- **Output :-**

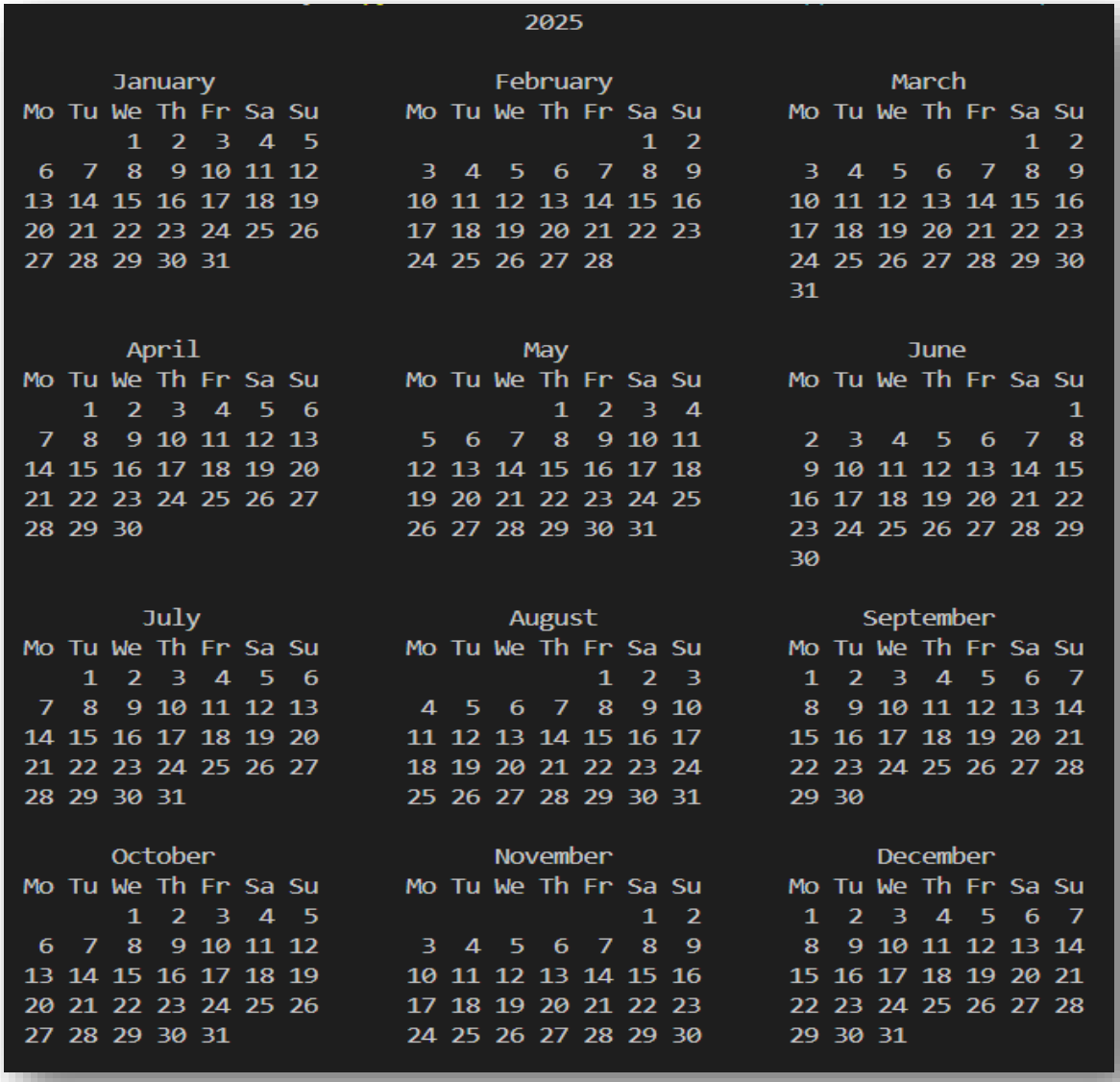
```
1.  Square root of 25 :  5.0
2.  Factorial of 5 :  120
3.  The Power is :  8.0
4.  45 Degree to Radian :  0.7853981633974483
5.  Log of 100 :  2.0
```

20. Write a python program to display the calendar of the year.

- **Program :-**

```
import calendar
def printcalennder(year) :
    print(calendar.calendar(year))
year=2025
printcalendar(year)
```

➢ **Output :-**



```
                                  2025

      January                   February                   March
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
       1  2  3  4  5                     1  2                      1  2
 6  7  8  9 10 11 12       3  4  5  6  7  8  9       3  4  5  6  7  8  9
13 14 15 16 17 18 19      10 11 12 13 14 15 16      10 11 12 13 14 15 16
20 21 22 23 24 25 26      17 18 19 20 21 22 23      17 18 19 20 21 22 23
27 28 29 30 31            24 25 26 27 28            24 25 26 27 28 29 30
                                                    31

      April                     May                       June
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
    1  2  3  4  5  6                  1  2  3  4                         1
 7  8  9 10 11 12 13       5  6  7  8  9 10 11       2  3  4  5  6  7  8
14 15 16 17 18 19 20      12 13 14 15 16 17 18       9 10 11 12 13 14 15
21 22 23 24 25 26 27      19 20 21 22 23 24 25      16 17 18 19 20 21 22
28 29 30                  26 27 28 29 30 31         23 24 25 26 27 28 29
                                                    30

       July                    August                  September
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
    1  2  3  4  5  6                     1  2  3       1  2  3  4  5  6  7
 7  8  9 10 11 12 13       4  5  6  7  8  9 10       8  9 10 11 12 13 14
14 15 16 17 18 19 20      11 12 13 14 15 16 17      15 16 17 18 19 20 21
21 22 23 24 25 26 27      18 19 20 21 22 23 24      22 23 24 25 26 27 28
28 29 30 31               25 26 27 28 29 30 31      29 30

      October                   November                  December
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
       1  2  3  4  5                     1  2       1  2  3  4  5  6  7
 6  7  8  9 10 11 12       3  4  5  6  7  8  9       8  9 10 11 12 13 14
13 14 15 16 17 18 19      10 11 12 13 14 15 16      15 16 17 18 19 20 21
20 21 22 23 24 25 26      17 18 19 20 21 22 23      22 23 24 25 26 27 28
27 28 29 30 31            24 25 26 27 28 29 30      29 30 31
```

21. Demonstrate the different ways of creating list objects with suitable example programs

- **Program :-**

```
List1 = [1, 2, 3, 4, 5]
List2 = [1, 'A', 3.2, "Praful", 5]
List3 = ["Apple", "Banana", "Mango", "Orange"]

print("List1 : ",List1[0:2])
print("List2 : ",List2[2:4])
print("List3 : ",List3[1:3])
```

- **Output :-**

```
List1 :  [1, 2]
List2 :  [3.2, 'Praful']
List3 :  ['Banana', 'Mango']
```

22. Demonstrate the following functions/methods which operates on strings in Python with suitable examples: i) len( ) ii) strip( ) iii) rstrip( ) iv) lstrip( )

- **Program :-**

```
string ="...Jay Shivray..."

print(string)

print("Length of String : ",len(string))

print("strip of String : ",string.strip('.'))

print("rstrip of String : ",string.rstrip('.'))

print("lstrip of String : ",string.lstrip('.'))
```

- **Output :-**

```
...Jay Shivray...
Length of String :  17
strip of String :  Jay Shivray
rstrip of String :  ...Jay Shivray
lstrip of String :  Jay Shivray...
```

23. Demonstrate the following functions/methods which operates on lists in Python with suitable examples: i) list( ) ii) len( ) iii) count( ) iv) index ( ) v) append( ) vi) insert( ) vii) extend() viii) remove( )

- **Program :-**

```
List = [10, 20, 30, 40, 20]
List2 = ['Praful',115]
print("1. The formed is : ",list(List)) #1. list()
print("2. No. of  Element in List : ",len(List)) #2. len()
print("3. Number of times 20 occured : ",List.count(20)) #3. count()
print("4. Index of 40 is : ",List.index(40)) #4. index()
List.append(50)
print("5. List after appending : ",List) #5. append()
List.insert(0,'Hi')
print("6. List after Inserting Data : ",List) #6. insert()
List.extend(List2)
print("7. List after Using Extend : ",List) #7. extend()
List.remove('Hi')
print("8. List after Remove 'Hi' : ",List) #8. remove()
```

- **Output :-**

```
1. The formed is :  [10, 20, 30, 40, 20]
2. No. of  Element in List :  5
3. Number of times 20 occured :  2
4. Index of 40 is :  3
5. List after appending :  [10, 20, 30, 40, 20, 50]
6. List after Inserting Data :  ['Hi', 10, 20, 30, 40, 20, 50]
7. List after Using Extend :  ['Hi', 10, 20, 30, 40, 20, 50, 'Praful', 115]
8. List after Remove 'Hi' :  [10, 20, 30, 40, 20, 50, 'Praful', 115]
```

24. Write a program to create, concatenate and print the string and accessing substring from a given string.

- **Program :-**

```
a = "Jay Bhawani"
b = " Jay Shivaji"
print("String 1 : ",a)
print("String 2 : ",b)
concatenate = a+b
print("Concatenate String : ",concatenate)

String1 = concatenate[0:11]
print("Substring is : ",String1)
```

- **Output :-**

```
String 1 :  Jay Bhawani
String 2 :   Jay Shivaji
Concatenate String :  Jay Bhawani Jay Shivaji
Substring is :  Jay Bhawani
```

25. Python program to count vowels in a string.

- **Program :-**

```
String = "Jay Shivray"
count = 0
for var in String:
    if(var=="a" or var=="e" or var=="i" or var=="o" or var=="u"):
        count+=1
print("No. of vowels is : ",count)
```

- **Output :-**

```
No. of vowels is :  3
```

26. Write a program to demonstrate working with dictionaries in python.

- **Program :-**

```
A = {'a':"Apple", 'b':"Ball", 'c':"Cat", 'd':"Dog"}
print("The Dictionary is : ",A)
A.update({'b':"Bat"}) #update()
print("The Updated Dictionary is : ",A)
print("The Length of Dictionary is : ",len(A)) #len()
Acopy = A.copy() #copy()
print("The Copied Dictionary is : ",Acopy)
print("Using key function : ",A.keys()) #keys()
print("Using get function : ",A.get('c')) #get()
print("Using values function : ",A.values()) #values()
```

- **Output :-**

```
The Dictionary is :  {'a': 'Apple', 'b': 'Ball', 'c': 'Cat', 'd': 'Dog'}
The Updated Dictionary is :  {'a': 'Apple', 'b': 'Bat', 'c': 'Cat', 'd': 'Dog'}
The Length of Dictionary is :  4
The Copied Dictionary is :  {'a': 'Apple', 'b': 'Bat', 'c': 'Cat', 'd': 'Dog'}
Using key function :  dict_keys(['a', 'b', 'c', 'd'])
Using get function :  Cat
Using values function :  dict_values(['Apple', 'Bat', 'Cat', 'Dog'])
```

27. Write a python program to find largest of three numbers.

- **Program :-**

```
a = 10
b = 20
c = 50
if(a>b) and (a>c):
   print("a is greater : ",a)
elif(b>a) and (b>c):
   print("b is greater : ",b)
else:
   print("c is greater : ",c)
```

- **Output :-**

```
c is greater :  50
```

28. Write a Python script to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are the square of the keys.

- **Program :-**

```
A = dict()
for x in range(1,16):
   A[x] = x ** 2
print(“The Dictionary is : ”,A)
```

- **Output :-**

```
The Dictionary is :  {1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81, 10: 100, 11: 121, 12: 144, 13: 169, 14: 196, 15: 225}
```

29. Python program to check whether the given integer is a multiple of both 5 and 7.

- **Program :-**

```
n = int(input("Enter the Number : "))
if(n%5== 0) and (n%7==0):
   print("This is Multiple of 5 and 7 ")
else:
   print("This is not Multiple of 5 and 7 ")
```

- **Output :-**

```
Enter the Number : 35
This is Multiple of 5 and 7

Enter the Number : 20
This is not Multiple of 5 and 7
```

30. Create a tuple containing 5 different fruits.Print the tuple and access the first and last elements using indexing.

- **Program :-**

```
fruits = ("Mango", "Banana", "Orange", "Grape",
"Apple") print("The Tuple is:", fruits)

print("First Element is : ", fruits[0])
print("Last Element is : ", fruits[-1])
```

- **Output :-**

```
The Tuple is: ('Mango', 'Banana', 'Orange', 'Grape',
'Apple') First Element is :  Mango
Last Element is :  Apple
```