Practical 11

Program 1:

```
val = input("Enter string:")

w1=0

w2=0

for i in val:

    if(i.islower()):

        w1=w1+1

    elif(i.isupper()):

        w2=w2+1

print("The number of lowercase characters in ", val, " is: ", w1)

print("The number of UPPERCASE characters in ", val, " is: ", w2)
```

Output:

```
C:\Users\Ritish Shelke\Desktop\6th Sem\Python\New folder>program1.py
Enter string:LearnPython
The number of lowercase characters in  LearnPython  is:  9
The number of UPPERCASE characters in  LearnPython  is:  2
```

Program2:

```
import random

print("Program to demonstrate math functions.")

print("-----------------------------------------")

num = random.randint(1,50)

fl = float(n)

print("Random float between 1-50 is: ",fl)

print("-----------------------------------------")
```
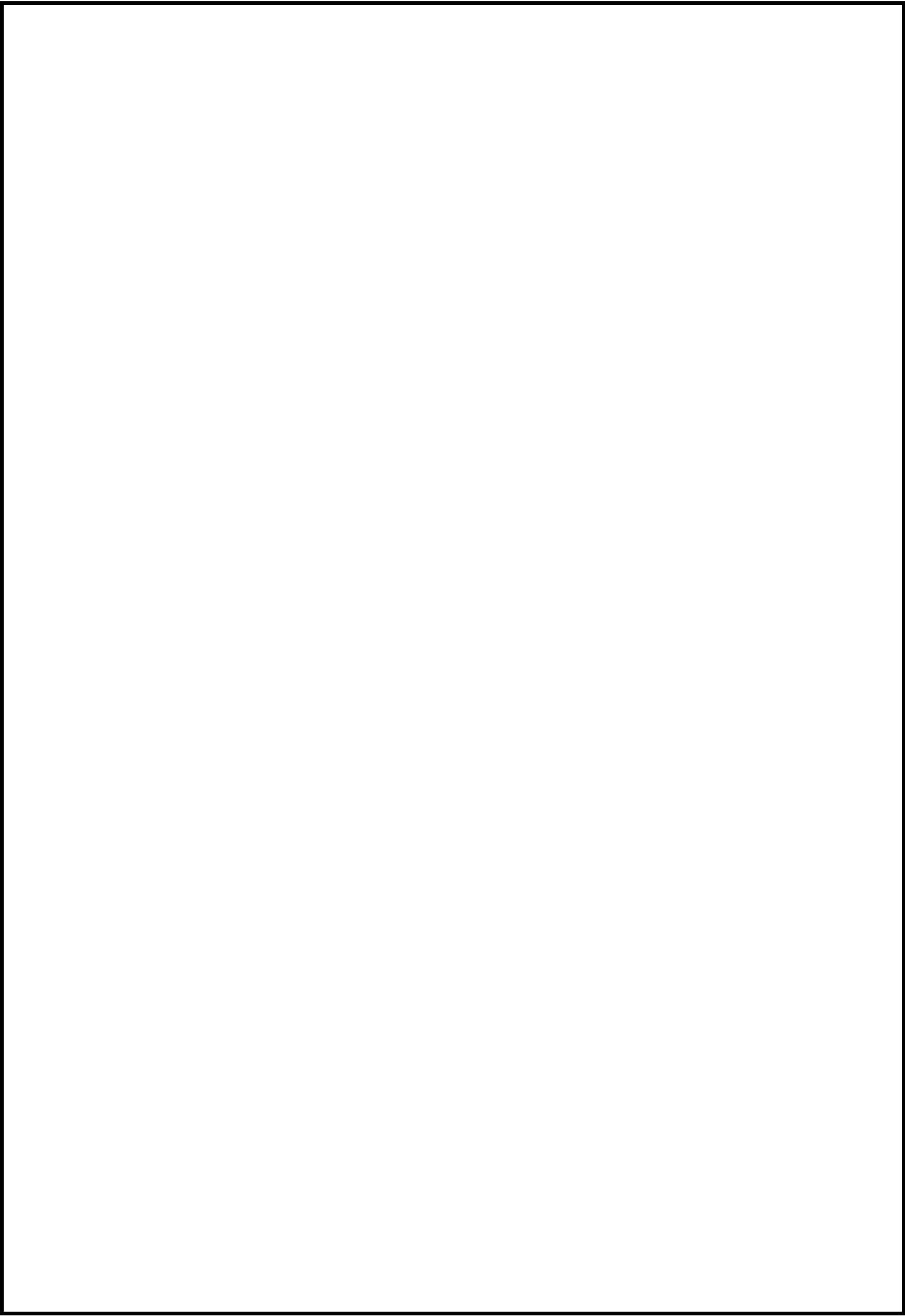
Output:

```
C:\Users\Ritish Shelke\Desktop\6th Sem\Python\New folder>program2.py
Program to demonstrate math functions.
-----------------------------------------
Random float between 1-50 is:  34.0
-----------------------------------------
```

Practical 12

Program 1:

```
def CalculateMortage(amt, intr, months):

    mortage = amt * (intr * (1 + intr)** months) / ((1 + intr) ** months - 1)

    print(mortage)

amount = int(input("Enter the amount of loan: "))

intrest = int(input("Enter the intrest rate: "))

intrest = float(intrest) / 100 / 12

months = int(input("Enter the number of months: "))

CalculateMortage(amount, intrest, months)
```

Output:

```
C:\Users\Ritish Shelke\Desktop\6th Sem\Python\New folder>program1.py
Program to demonstrate function with minimum 2 arguments.
----------------------------------------------------------
Enter the amount of loan: 200000
Enter the intrest rate: 5
Enter the number of months: 36
5994.179420933111
```
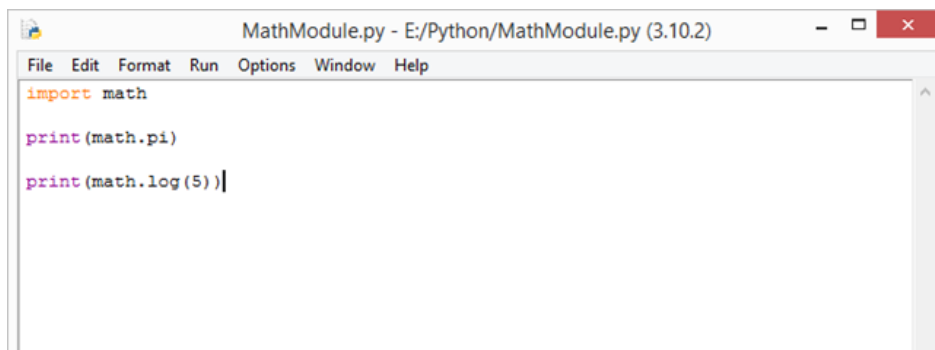
Program 2:

```python
def factorial(num):
    i = 1
    fact = 1
    for i in range(1,num+1):
        fact = fact*i
    return fact
number = int(input("Enter a number to find a factorial: "))
res = factorial(number)
print("Factorial of "+ str(number) + " is: "+ str(res))
```

Output:

```
C:\Users\Ritish Shelke\Desktop\6th Sem\Python\New folder>pr12_2.py
Enter a number to find a factorial: 5
Factorial of 5 is: 120
```
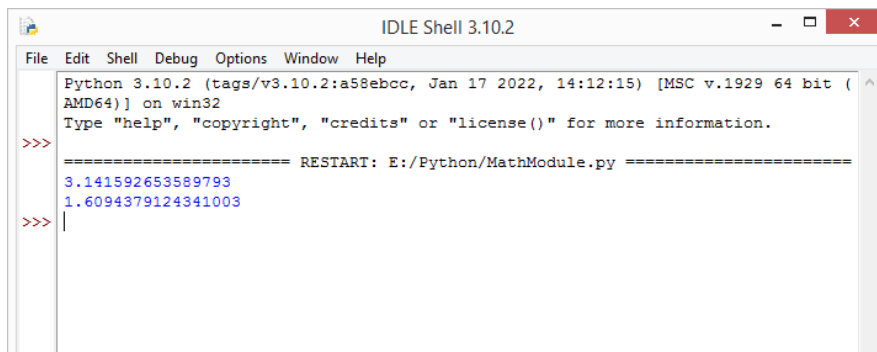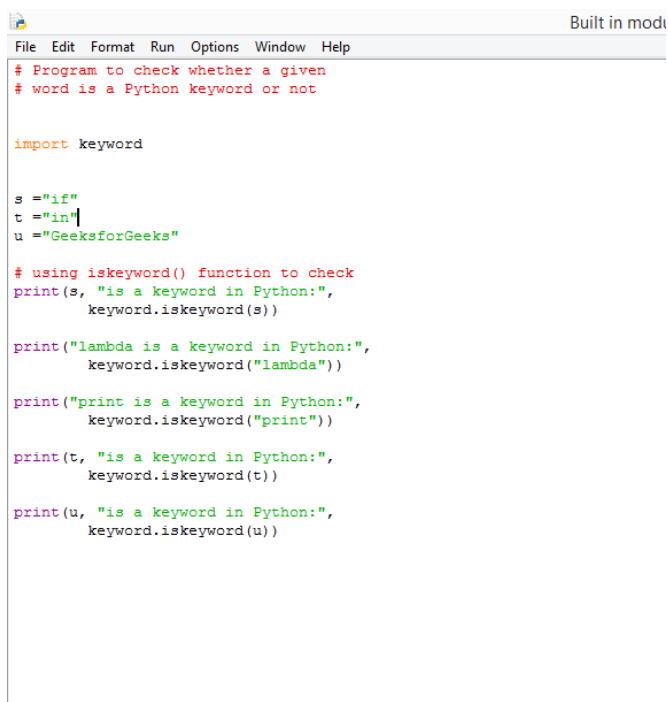
Practical 13

Math Module:

Output:

KeyWord Module:

```python
# Program to check whether a given
# word is a Python keyword or not

import keyword

s ="if"
t ="in"
u ="GeeksforGeeks"

# using iskeyword() function to check
print(s, "is a keyword in Python:",
        keyword.iskeyword(s))

print("lambda is a keyword in Python:",
        keyword.iskeyword("lambda"))

print("print is a keyword in Python:",
        keyword.iskeyword("print"))

print(t, "is a keyword in Python:",
        keyword.iskeyword(t))

print(u, "is a keyword in Python:",
        keyword.iskeyword(u))
```
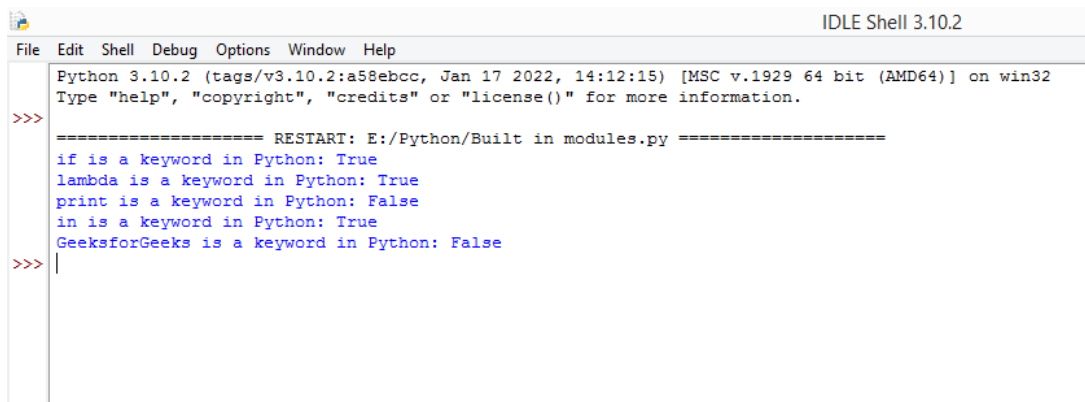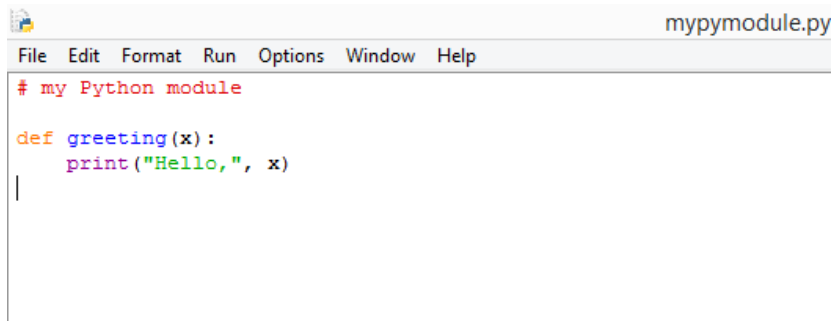
```
                                                                    IDLE Shell 3.10.2
File  Edit  Shell  Debug  Options  Window  Help
    Python 3.10.2 (tags/v3.10.2:a58ebcc, Jan 17 2022, 14:12:15) [MSC v.1929 64 bit (AMD64)] on win32
    Type "help", "copyright", "credits" or "license()" for more information.
>>>
    ==================== RESTART: E:/Python/Built in modules.py ====================
    if is a keyword in Python: True
    lambda is a keyword in Python: True
    print is a keyword in Python: False
    in is a keyword in Python: True
    GeeksforGeeks is a keyword in Python: False
>>> |
```
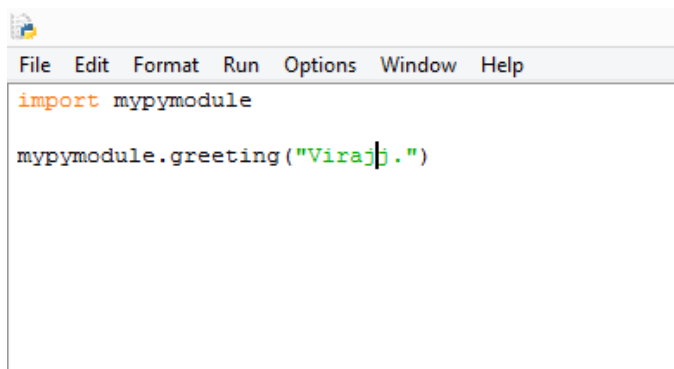
User Defined Module:

```
                                                        mypymodule.py
File  Edit  Format  Run  Options  Window  Help
# my Python module

def greeting(x):
    print("Hello,", x)
|
```
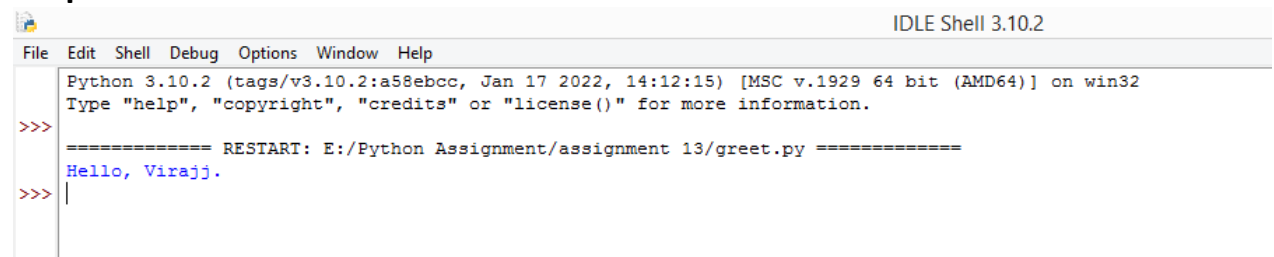
```
File  Edit  Format  Run  Options  Window  Help
import mypymodule

mypymodule.greeting("Virajj.")
```

Output:

```
                                                                    IDLE Shell 3.10.2
File  Edit  Shell  Debug  Options  Window  Help
    Python 3.10.2 (tags/v3.10.2:a58ebcc, Jan 17 2022, 14:12:15) [MSC v.1929 64 bit (AMD64)] on win32
    Type "help", "copyright", "credits" or "license()" for more information.
>>>
    ============= RESTART: E:/Python Assignment/assignment 13/greet.py =============
    Hello, Virajj.
>>> |
```

Practical 14

Matrix operations

```python
import numpy as np

mat1 = np.array([[7, 8, 9], [3, -1, 17], [15, 10, 21]])

mat2 = np.array([[9, -18, 27], [11, 22, 33], [13, -26, 39]])

mat3 = mat1 + mat2

print("The matrix addition is : \n",mat3)

mat4 = mat1  - mat2

print("The matrix subtraction is : \n",mat4)

mat5 = mat1.dot(mat2)

print("The matrix multiplication is: \n",mat5)

mat6 = mat1 / mat2

print("The matrix division is: \n",mat6)
```

output:

```
C:\Users\Ritish Shelke\Desktop\6th Sem\Python\Practicals>pr14a.py
The matrix addition is :
 [[ 16 -10  36]
 [ 14  21  50]
 [ 28 -16  60]]
The matrix subtraction is :
 [[ -2  26 -18]
 [ -8 -23 -16]
 [  2  36 -18]]
The matrix multiplication is:
 [[ 268 -184  804]
 [ 237 -518  711]
 [ 518 -596 1554]]
The matrix division is:
 [[ 0.77777778 -0.44444444  0.33333333]
 [ 0.27272727 -0.04545455  0.51515152]
 [ 1.15384615 -0.38461538  0.53846154]]
```

concatenate two string

str1="Hello"

str2="Python"

print ("String 1:",str1)

print ("String 2:",str2)

str=str1+str2

print("Concatenated two different strings:",str)

output:

```
C:\Users\Ritish Shelke\Desktop\6th Sem\Python\Practicals>pr14b.py
String 1: Hello
String 2: Python
Concatenated two different strings: HelloPython
```

A NumPy program to generate six random integers between 10 and 30

import numpy as np

x = np.random.randint(low=10, high=30, size=6)

print(x)

Output:

```
C:\Users\Ritish Shelke\Desktop\6th Sem\Python\Practicals>pr14b.py
[15 18 11 10 17 10]
```