Name: Manav Shah
Roll No:DSE Student
Second Year CS
Subject: **Programming Lab1**

Experiment No. 1

AIM:

1. Write a program to find square root of a number
2. Write a program to find the Fibonacci Series
3. Write a program to calculate sum of all elements of a array using recursion
4. Write a program to find prime numbers

DESCRIPTION:

1. In Square root program, we first take the input number from user(n). We then iterate from i=1 to n/2+1 to and check if i x i = n. Then i is the square root of the given number. We printed the square root. If not found, we displayed the message that n is not square.

2. In Fibonacci series the first two terms are 0 and 1. All other terms are obtained by adding the preceding two terms. This means to say the nth term is the sum of (n-1)th and (n-2)th term. Here we use the condition statements and for loop to find the number.

3. Recursion is a method of programming or coding a problem, in which a function calls itself one or more times in its body. Usually, it is returning the return value of this function call. A recursive function terminates, if with every recursive call the solution of the problem is downsized and moves towards a base case. A base case is a case, where the problem can be solved without further recursion. A recursion can end up in an infinite loop, if the base case is not met in the call. Thus, to find the sum of elements of an array, we define a recursive function.

4. In prime number program, we take the input number from the user. Then I pass it to a function isPrime(n) .we will declare a counter c = 0. We will iterate a loop from i=2 to n-1 and if n%i == 0 then increment the counter c=c+1. If at the end of loop if c = 0 it is prime number else it is not a prime number.

PROGRAM:

 # 1. Write a program to find square root of a number

```
[23] print ("Enter the number for finding square root : ")
     n=int(input())
     if n==1:
           print("Square root of ",n," is ",1)
     else:
           res = False
           for i in range(1,n//2):
               if i*i == n:
                   res = True
                   print("Square root of ",n," is ",i)
                   break
           if res == False:
               print("No square root for number",n)
```

OUTPUT:

```
Enter the number for finding square root :
81
Square root of  81  is  9
```

 # 2. Write a program to find the Fibonacci Series

```
[12]
     n=int(input("Enter the number of elements in fibonacci series "))

     if(n==1):
         print(0)
     else:
         print(0)
         a=0
         b=1
         c= a+b
         print(c)
         for i in range(2,n):
             c = a+b
             print(c)
             a=b
             b=c
```

OUTPUT:

```
Enter the number of elements in fibonacci series 10
0
1
1
2
3
5
8
13
21
34
```

 # 3. Write a program to calculate sum of all elements of a array using recursion

```
[13] summ =0
     def addele(a,index):
         global summ
         if index == len(a):
             return
         summ = summ + a[index]
         addele(a,index+1)

     a=[]
     n=int(input("ENTER THE NUMBER OF ELEMENTS IN LIST : "))
     for i in range(0,n):
         x=int(input("Enter element:"))
         a.append(x)
     addele(a,0)
     print("SUM OF ALL ELEMENTS : ", summ)
```

OUTPUT:

```
ENTER THE NUMBER OF ELEMENTS IN LIST : 5
Enter element:10
Enter element:20
Enter element:30
Enter element:40
Enter element:50
SUM OF ALL ELEMENTS :  150
```

 # 4. Implement service to find prime numbers

```
[30] def isPrime(n):
         c=0
         for i in range(2,n):
             if n % i == 0:
                 c = c + 1
         if c == 0:
             return True
         else:
             return False


     n=int(input("Enter the number to check for prime : "))
     res = isPrime(n)
     if res == True:
       print(n," is a prime number")
     else:
       print(n,"is not a prime number")
```

OUTPUT:

```
Enter the number to check for prime : 37
37  is a prime number
```

CONCLUSION:

Thus, from this experiment I implemented the basic programs of Python Programming Language using math library for calculating the square root of a given number, if else for finding the Fibonacci series for a number of terms, looping and conditional statements to find the prime numbers using Sieves method and function recursion for calculating the sum of elements in an array .