1. **Write a program to perform addition of two numbers by using user defined function and write a nested function to find sum of digits of a given number**.

```
def Addition():
  x=int(input(" Enter first number : "))
  y=int(input(" Enter second number :"))
  z=x+y
  print(" The addition of two numbers = ",z)
  def SumOfDigits():
    n=int(input(" Enter any number :"))
    s=0
    while n:
      r=n%10
      s=s+r
      n=n//10
    print(" The sum of digits = ",s)
  SumOfDigits()
Addition()
```

2A. Write a program to find factorial of a given number by using recursive function.

```
def Factorial(n):
  if n>0:
    return n*Factorial(n-1)
  else:
    return 1
n=int(input(" Enter any number : "))
F=Factorial(n)
print(" Factorial  = ",F)
```

2B. Write a program to find the factorial of a given number by using Iterative function.

```
def Factorial(n):
  return n
n=int(input(" Enter any number : "))
F=1
for i in range(1,n+1):
  F=F*Factorial(i)
print(" Factorial  = ",F)
```

3. Write a program to find area of a circle for the given radius using a user defined function.

```
import math
def Area(r):
  a= math.pi*r**2
  return a
r=int(input(" Enter radius : "))
A=Area(r)
print(" The area of Circle = ",A)
```

4. Write a program to check given number is prime number or not.

```
def Prime(n):
  c=0
  for i in range(1,n+1):
    if n%i==0:
      c=c+1
  if c==2:
    print(" Prime Number ")
  else:
    print(" Not a prime Number ")
n=int(input(" Enter any number : "))
Prime(n)
```

5. **Write a program to check given number is Armstrong number or not.**

```
def Armstrong(n):
  d=0
  s=0
  a=n
  b=n
  while n:
    d=d+1
    n=n//10
  while a:
    r=a%10
    s=s+r**d
    a=a//10
  if b==s:
    print(" Armstrong Number ")
  else:
    print(" Not an Armstrong Number ")
n=int(input(" Enter any Number : "))
Armstrong(n)
```

6. **Write a program to print Fibonacci series upto given number.**

```
def Fibonacci(n):
  a=0
  b=1
  if n<0:
    print(" No Fibonaci terms ")
  elif n==0:
    print(a)
  elif n==1:
    print(a, b, b)
  else:
    print(a,end='  ')
    print(b,end='  ')
    c=a+b
    while c<=n:
      print(c,end='  ')
      a=b
      b=c
      c=a+b
n=int(input(" Enter any Number : "))
Fibonacci(n)
```

7. **Write a program to find reverse of a given number using a user defined function.**

```
def Reverse(n):
  rev=0
  while n:
    r=n%10
    rev=rev*10+r
    n=n//10
  return rev
n=int(input(" Enter any Number : "))
R=Reverse(n)
print(" The Reverse of a given number = ",R)
```

8. **Write a program to print the following pattern upto given number of rows.**

If n=5, print the following output.

A B C D E
A B C D
A B C
A B
A

```
def Pattern(n):
  for i in range(1,n+1):
    c='A'
    for j in range(n+1,i,-1):
      print(c,end='  ')
      c=chr(ord(c)+1)
    print()
n=int(input(" Enter Number of Rows : "))
Pattern(n)
```

9. **Write a program to count and print the number of febonacci series terms are available in the user given range.**

```
def FebonacciCount(s,e):
  count=0
  a=0
  b=1
  if s<0 and e<0:
    count = 0
  elif s<=0 and e==0:
    count = 1
  elif s<=0 and e==1:
    count = 3
  elif s==1 and e==1:
    count = 2
  elif s<0 and e>1:
    count=2
    c=a+b
    while True:
      if c<=e:
        count=count+1
      else:
        break
      a=b
      b=c
      c=a+b
  elif s>0 and e>0:
    c=a+b
    while True:
      if c>=s and c<=e:
        count=count+1
      elif c>e:
        break
      a=b
      b=c
      c=a+b
  return count
s=int(input(" Enter strating number: "))
e=int(input(" Entr ending number:"))
n= FebonacciCount(s,e)
print(" No of terms= ",n)
```

10. **Write a program to read a string(Password) from the user and verify, if it is a valid password print 1 else print 0**

Rules of a Password:

Password shoulb be at least 8 chars in length

Password should contain at least one Upper case letter, One lower case letter, One special char, and One Digit atleast.

Password should not contain any white space.

```
def Password(p):
  U=0
  L=0
  D=0
  S=0
  Spl=0
  if len(p)>=8:
    for i in p:
      if i.isupper():
        U=U+1
      elif i.islower():
        L=L+1
      elif i.isdigit():
        D=D+1
      elif i.isspace():
        S=S+1
      else:
        Spl=Spl+1
    if U>0 and L>0 and D>0 and S==0 and Spl>0:
      return 1
    else:
      return 0
  else:
    return 0
p=input(" Enter your Passwor: ")
R=Password(p)
print(R)
```

11. **Write a program to read a string(User ID) from the user and verify, If it is a valid user id, then print 1 else print 0.**
Rules of a User ID:
User Id should not starts with digit.
User Id should not contain special char other than the UnderScore (_)
User Id should be at least 5 chars in length.
User Id may contain digits, alphabets but should not contain any white space.

```
def UserID(s):
  if len(s)>=5 and not(s[0].isdigit()):
    space=0
    spl=0
    for i in s:
      if i.isspace():
        space=space+1
      if not(i.isspace() or i.isalnum()):
        if i!='_':
          spl=spl+1
    if space==0 and spl==0:
      return 1
    else:
      return 0
  else:
    return 0
s=input(" Enter your User ID:")
R=UserID(s)
print(R)
```

12. **Write a program to find minimum of three numbers by using a user defined function.**

```
def Minimum(a,b,c):
  if a<=b and a<=c:
    return a
  elif b<=a and b<=c:
    return b
  else:
    return a
a=int(input(" Enter the first number : "))
b=int(input(" Enter the second number: "))
c=int(input(" Enter the third number :"))
M=Minimum(a,b,c)
print("The Minimum = ",M)
```

13. **A student writing his SSC examinations. You are expected to write a program to take his subject marks as input and display the grade of the student.**

```
def Grade(M):
  avg=sum(L)/len(L)
  if avg>=80:
    return 'A'
  elif avg>=70:
    return 'B'
  elif avg>=60:
    return 'C'
  elif avg>=50:
    return 'D'
  elif avg>=36:
    return 'E'
L=[]
for i in range(1,7):
  x=int(input(" Enter subject marks:"))
  L.append(x)
G=Grade(L)
print(" Grade = ",G)
```

14. **Write a program to store, display and delete the student data.**

```
def Add_Student():
  L=[]
  r=int(input(" Enter Roll Number : "))
  L.append(r)
  n=input(" Enter Name : ")
  L.append(n)
  b=input(" Enter Branch : ")
  L.append(b)
  y=input(" Enter year : ")
  L.append(y)
  return L
def Display(s):
  r=int(input(" Enter Roll Number : "))
  c=0
  for i in s:
    if r in i:
      print(i)
      c=c+1
  if c==0:
    print(" No Data Found ")
def Delete(s):
  r=int(input(" Enter Roll Number : "))
  c=0
  for i in s:
    if r in i:
      s.remove(i)
      c=c+1
  if c==0:
    print(" No Data Found ")
  return s
s=[]
while True:
  print("\n 1. Add Student \n 2. Display student ")
  print(" 3. Delete Student \n 4. Exit")
  opt=int(input(" Enter your option : "))
  if opt==1:
    x=Add_Student()
    s.append(x)
  elif opt==2:
    Display(s)
  elif opt==3:
    s=Delete(s)
  elif opt==4:
    break
  else:
    print(" Invalid Option")
```

15. **Write a program to check given string is a palindrom string or not by using a user defined function.**

```
def Palindrome(s):
  if s[::-1]==s:
    print(" Palindrome ")
  else:
    print(" Not a Palindrome ")
s=input(" Enter string : ")
Palindrome(s)
```