UNIT -2

2. i) Write a Program that generates the sequence of numbers till 100 which are only divisible by 3 and 7? [CO2,K3] ii) Write a python program for students marks grading

```
value=int(input("enter the number :"))
for i in range(1,value):
    if i % 3 == 0 and i % 7 == 0:
        print(i,end=" ")
```

OUTPUT:

enter the number :100

21 42 63 84

```
sub_1=int(input("enter the mark of Sub 1: "))
sub_2=int(input("enter the mark of Sub 2: "))
sub_3=int(input("enter the mark of Sub 3: "))
sub_4=int(input("enter the mark of Sub 4: "))
sub_5=int(input("enter the mark of Sub 5: "))
total = sub_1 + sub_2 + sub_3 + sub_4 + sub_5
print("the total marks is ",total)
average = total // 5
print("the average Mark is:",average)
if average >= 90:
    print("grade = A")
elif average >= 80:
    print("grade = B")
elif average >= 70:
    print("grade = C")
elif average >= 60:
    print("grade = D")
else:
    print("grade = F")
```

OUTPUT:

enter the mark of Sub 1: 55

enter the mark of Sub 2: 45

enter the mark of Sub 3: 56

enter the mark of Sub 4: 74

enter the mark of Sub 5: 100

the total marks is 330

the average Mark is: 66

grade = D

4. Write the following python programs. [CO2,K2] a. Exchange the value of two variables b. Circulate the value of n variables c. Voters Age Validation

```
a=int(input("enter the value of a:"))
b=int(input("enter the value of b:"))
temp = a
a = b
b = temp
print("the value of a after swapping is :", a)
print("the value of b after swapping is:", b
```

Output :

enter the value of a:10

enter the value of b:20

the value of a after swapping is: 20

the value of b after swapping is: 10

```
a = [10, 20, 30, 40, 50, 60]
value = int(input("enter the number of times to rotate:"))

result = a[value:] + a[:value]

print("After circulating the values are:", result)
```

Output:

Enter the number of times to rotate:4

After circulating the values are: [50, 60, 10, 20, 30, 40]

```
age= int(input("enter the age of the voter:"))
if age >= 18:
    print("Eligible to vote")
else:
    print("not eligible to  vote")
```

Output :

enter the age of the voter:5

not eligible to vote

5. Write the following python programs. [CO2,K2] a. Test whether a given year is leap year or not b. To print Fibonacci series c. To find factorial of a given number

```
year=int(input("enter the year:"))
if year % 4 == 0 or year % 100!= 0 and year % 400 == 0:
    print("It is a leap year")
else:
    print("It is not a Leap year")
```

OUTPUT:

enter the year:2024

It is a leap year

```
n = int(input("enter the number of terms: "))
num1 = 0
num2 = 1
next_number = num2
count = 1

while count <= n:
    print(next_number, end=" ")
    count += 1
    num1, num2 = num2, next_number
    next_number = num1 + num2
print()
```

Output :
enter the number of terms: 10

1 2 3 5 8 13 21 34 55 89

```
def factorial(n):
    if n == 0:
        return 1
    return n * factorial(n - 1)
num = int(input("enter the number:"))
print("Factorial is",factorial(num))
```

OUTPUT:

enter the number:5

Factorial is 120

6. Write the following python programs. [CO2,K2] a. Binary Search using Recursion b. Bubble sorting

```
def binary_search(arr, low, high, x):
    if high >= low:
       mid = (high + low) // 2
       if arr[mid] == x:
          return mid
       elif arr[mid] > x:
          return binary_search(arr, low, mid - 1, x)
       else:
          return binary_search(arr, mid + 1, high, x)
    else:
       return -1
arr = [ 2, 3, 4, 10, 40 ]
x = int(input("enter the element to be searched: "))
result = binary_search(arr, 0, len(arr)-1, x)
if result != -1:
    print("Element is present at index", str(result))
else:
    print("Element is not present in array")
```

OUTPUT:

enter the element to be searched: 10

Element is present at index 3

```
def bubblesort(elements):
    swapped = False
    for n in range(len(elements)-1, 0, -1):
       for i in range(n):
          if elements[i] > elements[i + 1]:
             swapped = True
             elements[i], elements[i + 1] = elements[i + 1], elements[i]
       if not swapped:
          return

elements = [39, 12, 18, 85, 72, 10, 2, 18]

print("Unsorted list is,")
print(elements)
bubblesort(elements)
print("Sorted Array is, ")
print(elements)
```

OUTPUT:

Unsorted list is,

[39, 12, 18, 85, 72, 10, 2, 18]

Sorted Array is,

[2, 10, 12, 18, 18, 39, 72, 85]