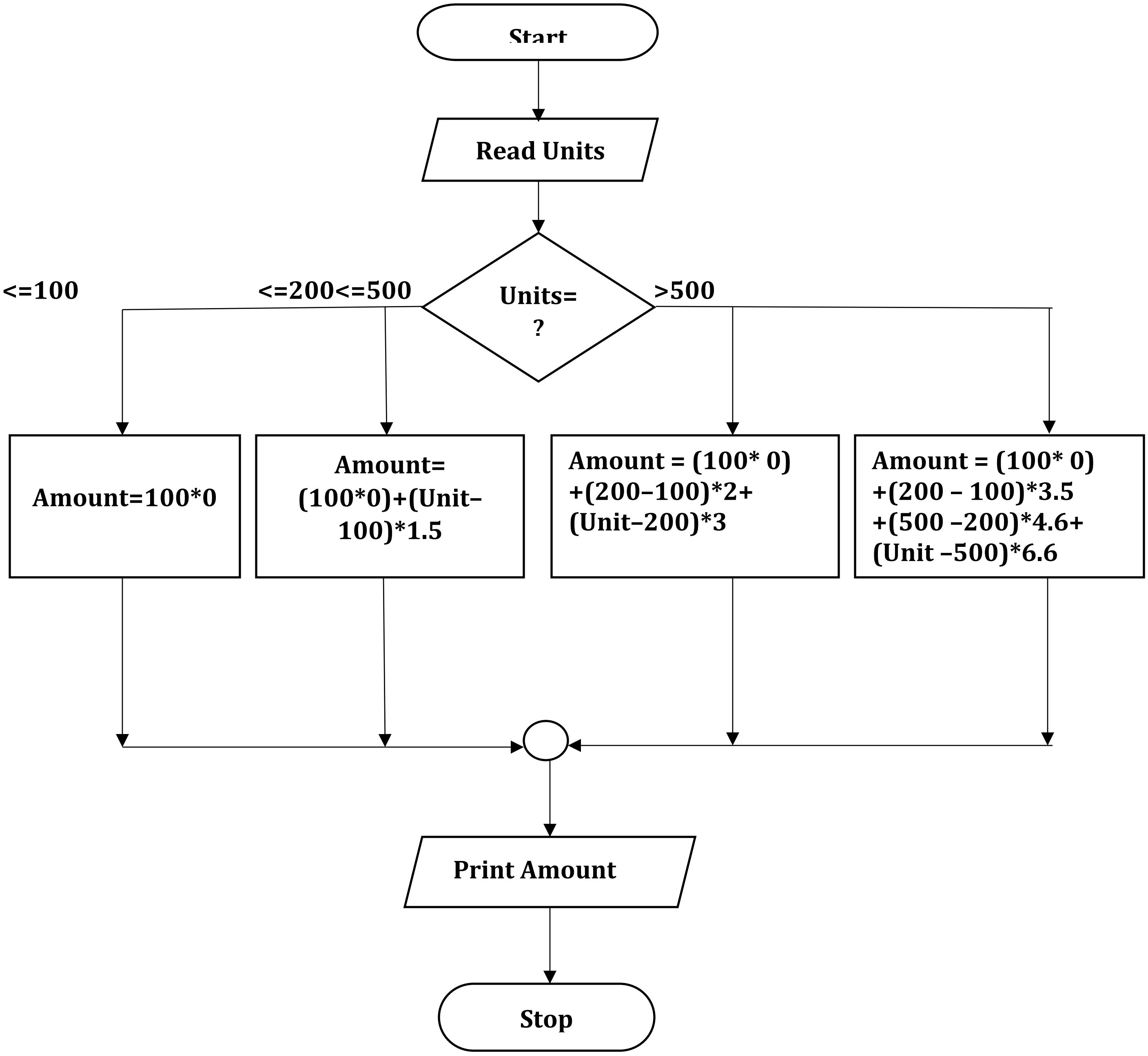
Ex. No: 1.A)ELECTRICITYBILLING

Aim

To draw flowchart for Electricity Billing

Flowchart



Result

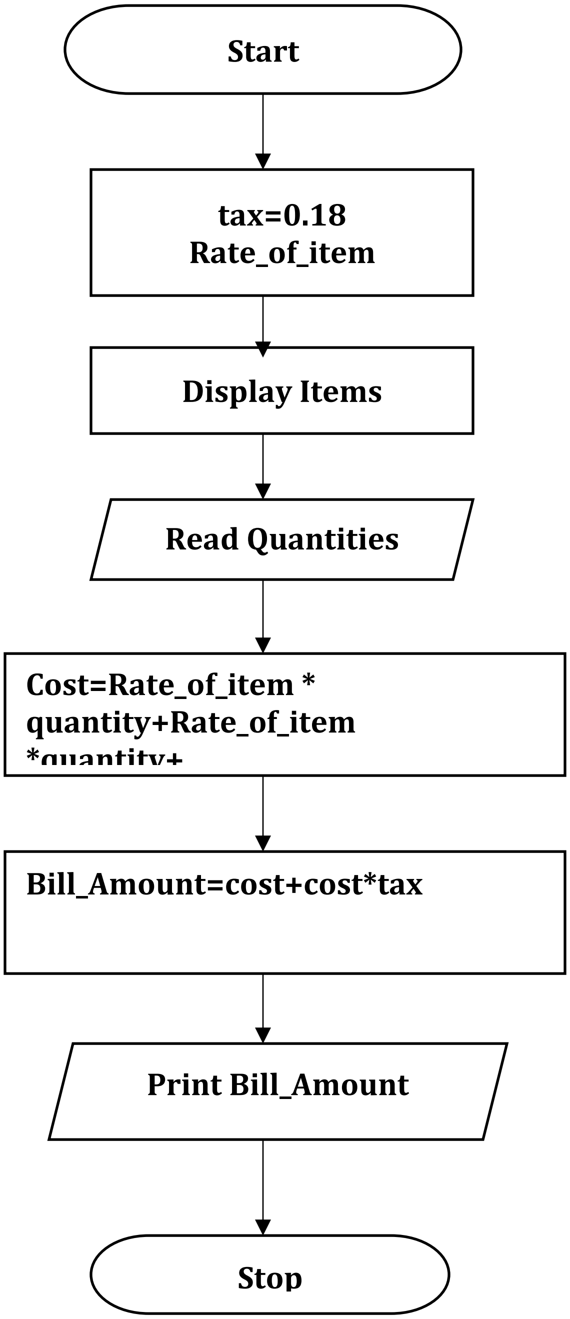
Thusthe flowchart for Electricity Billing was drawn successfully

Ex. No: 1.B) **RETAIL SHOPBILLING**

Aim

To draw flowchart for Retail shopbilling

Flowchart



Result

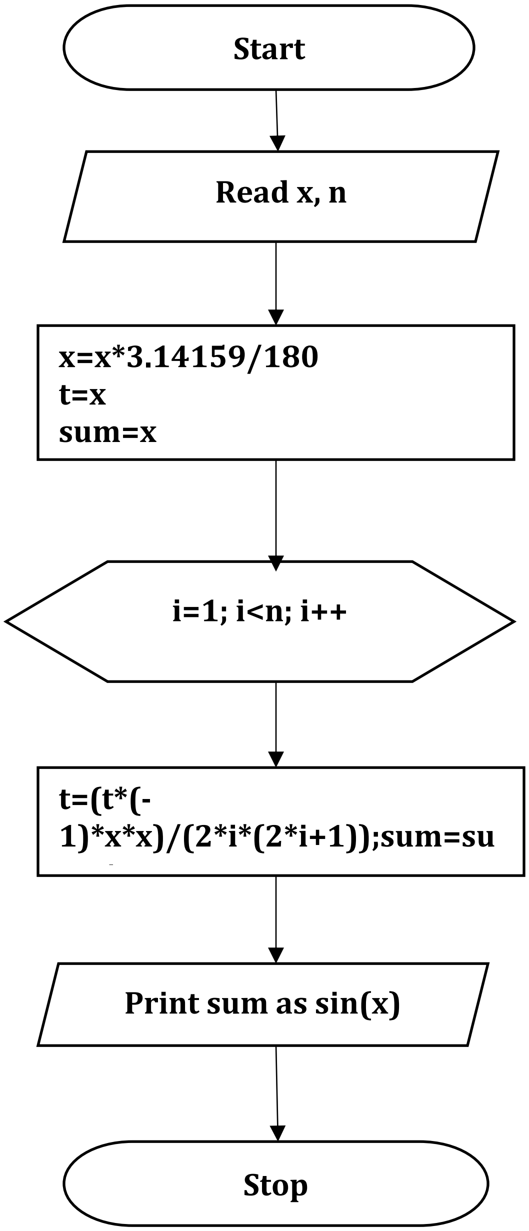
Thusthe flowchart for Retail shopbillingwas drawn successfully

Ex. No: 1.C) SINESERIES

Aim

Toevaluateand draw flowchart for Sine Series

Flowchart



Result

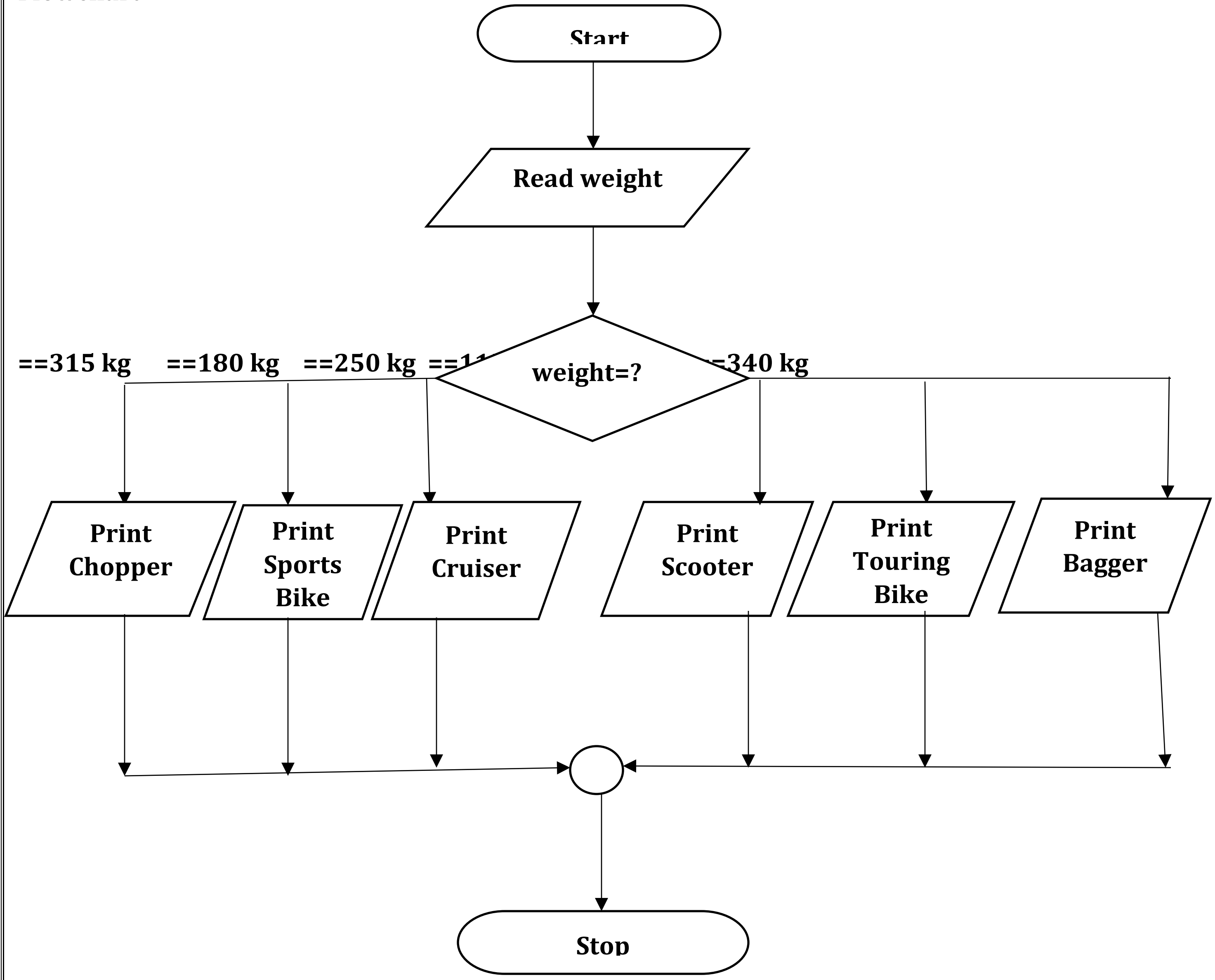
Thusthe flowchart for Sine Serieswas drawn successfully

Ex. No: 1.D) **WEIGHTOF AMOTORBIKE**

Aim

To draw flowchart for weight of Motorbike

Flowchart



Result

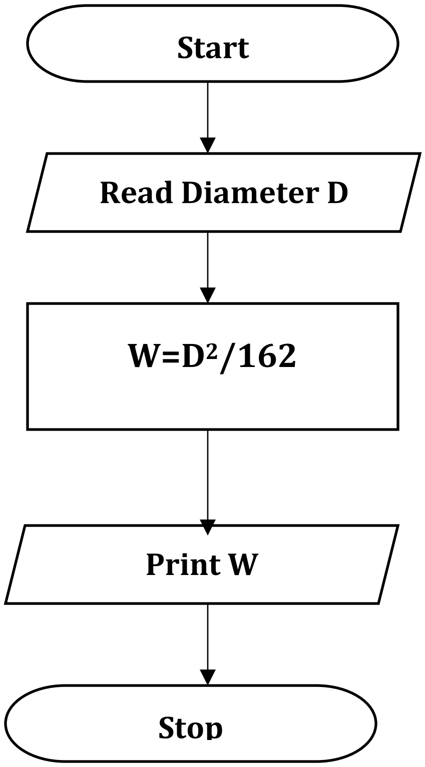
Thusthe flowchart for weight of Motorbike was drawn successfully

Ex. No: 1.E) **WEIGHTOFA STEELBAR**

Aim

To draw flowchart for Weight of a Steel Bar

Flowchart



Result

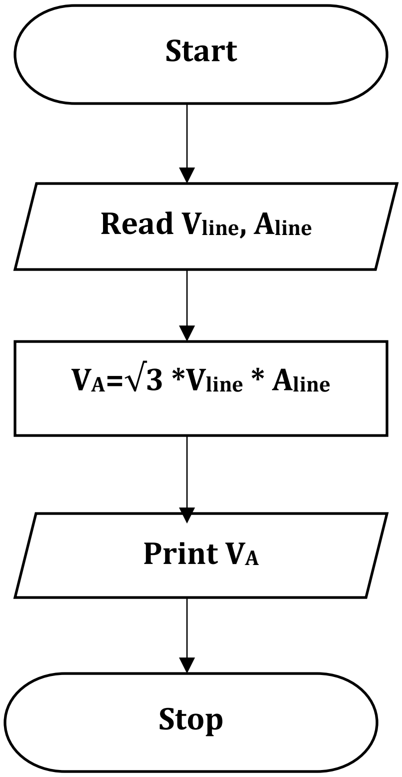
Thusthe flowchart for Weight of a Steel Bar was drawn successfully

Ex. No: 1.F) **COMPUTE ELECTRICAL CURRENT IN THREEPHASE ACCIRCUIT**

Aim

To draw flowchart for Computeelectrical current inthreephaseACcircuit.

Flowchart


Start
Read V_{line}, A_{line}
$V_A=\sqrt{3} * V_{line} * A_{line}$
Print V_A
Stop

Result

Thusthe flowchart for Computeelectrical current inthreephaseACcircuit was drawn successfully

Ex. No: 2.A) EXCHANGE THE VALUES OF TWO VARIABLES USING TEMPORARY VARIABLE

Aim

To write a program to exchange the values of two variables using third variable

Algorithm

```
1. Start
2. Read x and y
3. Print x and y value before swap
3. Swap values using temporary variable
temp=x
    x=y
    y=temp
4. Print x and y value after swap
5. Stop
```

Program

```
x = int(input("Enter x value:"))
y = int(input("Enter y value:"))
print("Value of x and y before swap:",x,y)
temp = x
x = y
y = temp
print("Value of x and y after swap:",x,y)
```

Output

```
Enter x value:10
Enter y value:23
Value of x and y before swap: 10 23
Value of x and y after swap: 23 10
```

Result

Thus the Python program to exchange the values of two variables by using a third variable was executed successfully

Ex. No: 2.B) EXCHANGE THE VALUES OF TWO VARIABLES WITHOUT USING TEMPORARY VARIABLE

Aim

To write a program to exchange the values of twovariables without using third variable

Algorithm

```
1. Start
2. Read x and y
3. Print x and y value before swap
3. Swap values without temporary variable
x=x+y
y=x-y
x=x-y
4. Print x and y value after swap
5. Stop
```

Program

```
x = int(input("Enter x value:"))
y = int(input("Enter y value:"))
print("Value of x and y before swap:",x,y)
x=x+y
y=x-y
x=x-y
print("Value of x and y after swap:",x,y)
```

Output

```
Enter x value:24
Enter y value:45
Value of x and y before swap: 24 45
Value of x and y after swap: 45 24
```

Result

Thus the Python program to exchange the values of two variables without using a third variable was executed successfully.

Ex. No: 2.C) **CIRCULATE THE VALUES OF N VARIABLES**

Aim

To write a program to circulate the values of N variables.

Algorithm

```
1. Start
2. Read upper limit n
3. Read n element using loop
4. Store elements in list
5. POP out each element from list and append to list
6. Print list
7. Stop
```

Program

```
n = int(input("Enter number of values:"))
list1=[]
fori in range(0,n,1):
   x=int(input("Enter integer:"))
   list1.append(x)
print("Circulating the elements of list:",list1)
fori in range(0,n,1):
   x=list1.pop(0)
   list1.append(x)
print(list1)
```

Output

```
Enter number of values:3
Enter integer:2
Enter integer:3
Enter integer:5
Circulating the elements of list: [2, 3, 5]
[3, 5, 2]
[5, 2, 3]
[2, 3, 5]
```

Result

Thus the Python program to circulate the values of N variables was executed successfully.

Ex. No: 2.D)

DISTANCE BETWEEN TWO VARIABLES

Aim

To write a program to find distance between two variables.

Algorithm

1. Start
2. Read four coordinates x1, y1, x2, y2
3. Find distance using $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
4. Print distance
5. Stop

Program

```
x1=int(input("Enter x1 value: "))
y1=int(input("Enter y1 value: "))
x2=int(input("Enter x2 value: "))
y2=int(input("Enter y2 value: "))
distance=((x2-x1)*(x2-x1)+(y2-y1)*(y2-y1))**0.5
print("Distance = ",distance)
```

Output

```
Enter x1 value: 1
Enter y1 value: 2
Enter x2 value: 3
Enter y2 value: 4
Distance =  2.8284271247461903
```

Result

Thus the Python program to find distance between two variables was executed successfully.

Ex. No: 3.A) **NUMBER SERIES**

Aim

To write a program to evaluate number series $1^2+2^2+3^2+....+N^2$

Algorithm

```
1. Start
2. Read maximum limit n
3. Initialize sum=0 and i=1
4. Calculate sum of series
while  i<=n:
sum=sum+i*i
incrementi
5. Print sum
6. Stop
```

Program

```
n = int(input('Enter a number: '))
sum=0
i=1
while i<=n:
   sum=sum+i*i
   i+=1
print('Sum = ',sum)
```

Output

```
Enter a number: 3
Sum =  14
```

Result

Thus the Python program to evaluate number series was executed successfully.

Ex. No: 3.B) NUMBER PATTERN

Aim

To write a program to print number pattern

Algorithm

```
1. Start
2. Read upper limit N
3. Print pattern using nested for loop
For i in range(1,N+1)
for k in range (N,i-1)
print empty space
for j in range(1,i+1)
print j
for l in range(i-1,0,-1)
print l
4. Stop
```

Program

```
rows = int(input("Enter the number of rows: "))
for i in range(rows+1):
  for j in range(i):
    print(i, end=" ")
  print("")
```

Output

```
Enter the number of rows: 5
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

Result

Thus the Python program to print number pattern was executed successfully.

Ex. No: 4.A) ITEMS PRESENT IN A LIBRARY

Aim

To write a program to implement operations in a library list

Algorithm

1. Start
2. Read library list
3. Print library details
4. Print first and fourth position element
5. Print items from index 0 to 4
6. Append new item in library list
7. Print index of particular element
8. Sort and print the element in alphabetical order
9. Pop the element
10. Remove the element
11. Insert an element in position
12. Count the number of elements in library
13. Stop

Program

```
library =['Books','Periodicals','Newspaper','Manuscripts','Maps','Prints','Documents','Ebooks']
print('Library: ',library)
print('First element: ',library[0])
print('Fourth element: ',library[3])
print('Items in Library from 0 to 4 index: ',library[0: 5])
print('-7th element: ',library[-7])
library.append('Audiobooks')
print('Library list after append( ): ',library)
print('Index of \'Newspaper\': ',library.index('Newspaper'))
library.sort( )
print('After sorting: ', library);
print('Popped elements is: ',library.pop( ))
print('After pop( ): ', library);
library.remove('Maps')
```

```
print('After removing \'Maps\': ',library)
library.insert(2, 'CDs')
print('After insert: ', library)
print('Number of Elements in Library list: ',library.count('Ebooks'))
```

Output

```
Library:  ['Books', 'Periodicals', 'Newspaper', 'Manuscripts', 'Maps', 'Prints', 'Documents', 'Ebooks']
First element:  Books
Fourth element:  Manuscripts
Items in Library from 0 to 4 index:  ['Books', 'Periodicals', 'Newspaper', 'Manuscripts', 'Maps']
-7th element:  Periodicals
Library list after append( ):  ['Books', 'Periodicals', 'Newspaper', 'Manuscripts', 'Maps', 'Prints', 'Documents',
'Ebooks', 'Audiobooks']
Index of 'Newspaper':  2
After sorting:  ['Audiobooks', 'Books', 'Documents', 'Ebooks', 'Manuscripts', 'Maps', 'Newspaper',
'Periodicals', 'Prints']
Popped elements is:  Prints
After pop( ):  ['Audiobooks', 'Books', 'Documents', 'Ebooks', 'Manuscripts', 'Maps', 'Newspaper', 'Periodicals']
After removing 'Maps':  ['Audiobooks', 'Books', 'Documents', 'Ebooks', 'Manuscripts', 'Newspaper',
'Periodicals']
After insert:  ['Audiobooks', 'Books', 'CDs', 'Documents', 'Ebooks', 'Manuscripts', 'Newspaper', 'Periodicals']
Number of Elements in Library list:  1
```

Result

Thus the Python program toprint items present in a library using list operationwas executed successfully.

Ex. No: 4.B) COMPONENTS OF A CAR

Aim

To write a program to implement operations of Tuple using Components of a Car

Algorithm

1. Start
2. Read car tuple
3. Print components of car
4. Print first and fourth position element
5. Print items from index 0 to 4
6. Print index of particular element
7. Count the number of ‘Seat Belt element’ in car tuple
8. Count number of elements in car tuple
9. Stop

Program

```
car = ('Engine','Battery','Alternator','Radiator','Steering','Break','SeatBelt')
print('Components of a car: ',car)
print('First element: ',car[0])
print('Fourth element: ',car[3])
print('Components of a car from 0 to 4 index: ',car[0: 5])
print('3rd or -7th element: ',car[-7])
print('Index of \'Alternator\': ',car.index('Alternator'))
print('Number of Elements in Car Tuple : ',car.count('Seat Belt'))
print('Length of Elements in Car Tuple : ',len(car))
```

Output

```
Components of a car:  ('Engine', 'Battery', 'Alternator', 'Radiator', 'Steering', 'Break', 'SeatBelt')
First element:  Engine
Fourth element:  Radiator
Components of a car from 0 to 4 index:  ('Engine', 'Battery', 'Alternator', 'Radiator', 'Steering')
3rd or -7th element:  Engine
Index of 'Alternator':  2
```

```
Number of Elements in Car Tuple:  0
Length of Elements in Car Tuple:  7
```

Result

Thus the Python program toprint components of a car using tuple operation was executedsuccessfully.

Ex. No: 4.C) MATERIALS REQUIRED FOR CONSTRUCTION OF A BUILDING

Aim

Towrite a program for operations of list to printmaterials required for construction of a building

Algorithm

1. Start
2. Read material list
3. Print material details
4. Print first and fourth position element
5. Print number of elements in material list
6. Print items from index 0 to 2
7. Append new item in material list
8. Print list of material after append
9. Print ending alphabet of material
10. Print starting alphabet of material
11. Print index of particular element
12. Sort and print the element in alphabetical order
13. Pop the element and print remaining element of material
14. Remove an element and print remaining element of material
15. Insert an element in position
16. Print the element after inserting
17. Stop

Program

```
material =['Wood','Concrete','Brick','Glass','Ceramics','Steel']
print('Building Materials',material)
print('First element: ',material[0])
print('Fourth element: ',material[3])
print('Number of Elements in Material list : ',len(material))
print('Items in Material from 0 to 2 index: ',material[0: 3])
print('-3th element: ',material[-3])
material.append('Water')
print('Material list after append(): ',material)
print('Ending Alphabet of Material',max(material))
print('Starting Alphabet of Material',min(material))
print('Index of Brick: ',material.index('Brick'))
material.sort( )
print('After sorting: ', material);
print('Popped elements is: ',material.pop())
print('After pop(): ', material);
material.remove('Glass')
print('After removing Glass: ',material)
material.insert(3, 'Stone')
print('After insert: ', material)
```

Output

```
Building Materials ['Wood', 'Concrete', 'Brick', 'Glass', 'Ceramics', 'Steel']
First element:  Wood
Fourth element:  Glass
Number of Elements in Material list :  6
Items in Material from 0 to 2 index:  ['Wood', 'Concrete', 'Brick']
-3th element:  Glass
Material list after append():  ['Wood', 'Concrete', 'Brick', 'Glass', 'Ceramics', 'Steel', 'Water']
Ending Alphabet of Material Wood
Starting Alphabet of Material Brick
Index of Brick:  2
After sorting:  ['Brick', 'Ceramics', 'Concrete', 'Glass', 'Steel', 'Water', 'Wood']
Popped elements is:  Wood
After pop():  ['Brick', 'Ceramics', 'Concrete', 'Glass', 'Steel', 'Water']
After removing Glass:  ['Brick', 'Ceramics', 'Concrete', 'Steel', 'Water']
After insert:  ['Brick', 'Ceramics', 'Concrete', 'Stone', 'Steel', 'Water']
```

Result

Thus the Python program toprint materials required for construction of a building using list operation was executed successfully.

Ex. No: 5.B) ELEMENTS OF A CIVIL STRUCTURE

Aim

Toimplementoperations of dictionary to printelements of a civil structure

Algorithm

1. Start
2. Read elements in civil variable
3. Print elements
4. Insert element in last position and print
5. Update element in particular position and print the elements
6. Print the value of key using square bracket and get method
7. Remove element from the structure and print the remaining elements
8. Remove element arbitrarily using popitem( ) function
9. Stop

Program

```
civil = {1:'Foundation',2:'Roof',3:'Beams',4:'Columns',5:'Walls'};
print(civil)
civil[6]='Stairs'
print("Print elements after adding:",civil)
civil[3]='Lintels'
print("Elements after updating key 3:",civil)
print("Print value of Key 2:",civil[2])
print("Print value of Key 5:",civil.get(5))
print("Element removed from key 1:",civil.pop(1))
print("Elements after removal:",civil)
print("Element removed arbitrarily:",civil.popitem())
print("Elements after pop:",civil)
```

Output

```
{1: 'Foundation', 2: 'Roof', 3: 'Beams', 4: 'Columns', 5: 'Walls'}
Print elements after adding: {1: 'Foundation', 2: 'Roof', 3: 'Beams', 4: 'Columns', 5: 'Walls', 6: 'Stairs'}
Elements after updating key 3: {1: 'Foundation', 2: 'Roof', 3: 'Lintels', 4: 'Columns', 5: 'Walls', 6: 'Stairs'}
```

```
Print value of Key 2: Roof
Print value of Key 5: Walls
Element removed from key 1: Foundation
Elements after removal: {2: 'Roof', 3: 'Lintels', 4: 'Columns', 5: 'Walls', 6: 'Stairs'}
Element removed arbitrarily: (6, 'Stairs')
Elements after pop: {2: 'Roof', 3: 'Lintels', 4: 'Columns', 5: 'Walls'}
```

Result

Thus the Python program toprint elements of civil structure using dictionary operation was executed successfully.

Ex. No: 6.A) **FACTORIAL USING RECURSION**

Aim

To write a program to find the factorial of a number using recursion

Algorithm

```
1. Start
2. Read num
3. Call fact (n)
4. Print factorial f
5. Stop
Fact (n)
1. if n==1 then
        return n
2. else
         return (n*fact (n-1))
```

Program

```
def fact (n):
    if n==1:
        return n
    else:
        return (n*fact (n-1))
num = int (input("Enter a number: "))
f=fact(num)
print("The factorial of",num,"is",f)
```

Output

```
Enter a number: 3
The factorial of 3 is 6
```

Result

Thus the Python program tofind factorial of a number using recursion was executed successfully.

Ex. No: 6.B) FINDING LARGEST NUMBER IN A LIST USING FUNCTION

Aim

To write a program to find the largest number in a list using functions.

Algorithm

```
1. Start
2. Initialize empty list as lis1t=[ ]
3. Read upper limit of list n
4. Read values of list using for loop
fori in range(1,n+1)
        Read num
        Append num in list1
5. Call function myMax(list1)
6. Stop
myMax(list1)
1. Print largest element in a list using max( ) function
```

Program

```
def myMax(list1):
   print("Largest element is:", max(list1))
list1 = []
n = int(input("Enter number of elements in list: "))
for i in range(1, n + 1):
   num = int(input("Enter elements: "))
list1.append(num)
myMax(list1)
```

Output

```
Enter number of elements in list: 4
Enter elements: 23
Enter elements: 15
Enter elements: 67
Enter elements: 45
Largest element is: 67
```

Result

Thus the Python program tofind thelargest numberin alist using functions was executed successfully.

Ex. No: 6.C) FINDING AREA OF A SHAPE USING FUNCTION

Aim

To write a program to find the area of a shape using functions

Algorithm

```
1. Start
2. Print Calculate Area of Shape
3. Read shape_name
4. Call function calculate_area(shape_name)
5. Stop
calculate_area(name):
1. Convert letters into lowercase
2. Check name== “rectangle” :
    2.1. Read l
    2.2. Read b
    2.3. Calculate rect_area=l*b
    2.4. Print area of rectangle
3. elif name==”square”:
   3.1. Read s
   3.2. Calculate sqt_area = s * s
   3.3. Print area of square
4. elif name == "triangle":
   4.1. Read h
   4.2. Read b
   4.3. Calculate tri_area = 0.5 * b * h
   4.4. Print area of triangle
5. elif name == "circle":
    5.1. Read r
    5.2. Calculate circ_area = pi * r * r
    5.3. Print area of circle
6. else:
   6.1. Print Sorry! This shape is not available
```

Program

```
def calculate_area(name):
          name = name.lower()
         if name == "rectangle":
               l = int(input("Enter rectangle's length: "))
               b = int(input("Enter rectangle's breadth: "))
               rect_area = l * b
               print ("The area of rectangle=", rect_area)
        elif name == "square":
               s = int(input("Enter square's side length: "))
               sqt_area = s * s
                print ("The area of square=",sqt_area)
        elif name == "triangle":
               h = int(input("Enter triangle's height length: "))
               b = int(input("Enter triangle's breadth length: "))
               tri_area = 0.5 * b * h
               print ("The area of triangle=",tri_area)
        elif name == "circle":
                r = int(input("Enter circle's radius length: "))
                 pi = 3.14
                circ_area = pi * r * r
                print ("The area of circle=",circ_area)
        else:
               print("Sorry! This shape is not available")
               print("Calculate Area of Shape")
shape_name = input("Enter the name of shape: ")
calculate_area(shape_name)
```

Output

```
Calculate Area of Shape
Enter the name of shape: rectangle
Enter rectangle's length: 2
Enter rectangle's breadth: 3
('The area of rectangle=', 6)
```

Result

Thus the Python program to findthe areaof a shapeusing functionswas executedsuccessfully.

Ex. No: 7.A) **REVERSINGA STRING**

Aim

To write a program to find reverse a string.

Algorithm

```
1. Start
2. Read string in s
3. Print reversed string through function reverse(s)
4. Stop
reverse(string):
1. Reverse a string using join(reversed(string))
2. return reversed string
```

Program

```
def reverse(string):
   string = "".join(reversed(string))
   return string
s = input("Enter any string: ")
print ("The original string is:",s)
print ("The reversed string(using reversed):",reverse(s))
```

Output

```
Enter any string: river
('The original string is:', 'river')
('The reversed string(using reversed):', 'revir')
```

Result

Thus the Python program to find reverse astring was executed successfully.

Ex. No: 7.B) PALINDROME IN A STRING

Aim

To write a program to check a given string is palindrome or not.

Algorithm

```
1. Start
2. Read string
3. Reverse a string using reversed( ) function
4. Check rev_string==original_string
       Print "It is palindrome"
5. else
It is not palindrome
6. Stop
```

Program

```
string = input("Enter string: ")
rev_string = reversed(string)
if list(string)== list(rev_string):
   print("It is palindrome")
else:
   print("It is not palindrome")
```

Output

```
Enter string: mam
It is palindrome
```

Result

Thus the Python program tocheck a string palindrome was executed successfully.

Ex. No: 7.C) COUNT CHARACTERS IN A STRING

Aim

To write a program to count number of characters in a string.

Algorithm

```
1. Start
2. Read string
3. Read character to count
4. Count number of characters using count( ) function
5. Print count
6. Stop
```

Program

```
string = input("Enter any string: ")
char = input("Enter a character to count: ")
val = string.count(char)
print("count",val)
```

Output

```
Enter any string: river
Enter a character to count: r
('count', 2)
```

Result

Thus the Python program tocountnumber ofcharacters in astringwas executed successfully.

Ex. No: 7.D) **REPLACING CHARACTERS**

Aim

To write a program to replace characters in a string.

Algorithm

```
1. Start
2. Read string
3. Read old string to replace in str1
4. Read new string in str2
5. replace(str1,str2)
6. Print replaced string
7. Stop
```

Program

```
string = input("Enter any string: ")
str1 = input("Enter old string: ")
str2 = input("Enter new string: ")
print(string.replace(str1, str2))
```

Output

```
Enter any string: python
Enter old string: p
Enter new string: P
Python
```

Result

Thus the Python program toreplace characters inastring was executed successfully