EXPT.NO : 6(a) DATE:	**Implementing Factorial Programs Using Functions.**

AIM:

To Write a Python function to calculate the factorial of a number

PROCEDURE:

Step 1:Get a positive integer input (n) from the user.

Step 2:check if the values of n equal to 0 or not if it's zero it will return 1

Otherwise else statement can be executed

Step 3:Using the below formula, calculate the factorial of a number n*factorial(n-1)

Step 4:Print the output i.e the calculated

PROGRAM:

```
def factorial(n):
    if n == 0:
        return 1
    else:
        return n * factorial(n-1)
n=int(input("Input a number to compute the factorial : "))
print(factorial(n))
```

OUTPUT:

```
Input a number to compute the factorial: 4
24
```

RESULT:

Thus the program was executed and verified successfully

EXPT.NO : 6(b) DATE:	**Implementing Program Largest Number In A List Using Function**

AIM:

To Write a Python program to get the largest number from a list.

PROCEDURE:

Step 1- Declare a function that will find the largest number

Step 2- Use max() method and store the value returned by it in a variable

Step 3- Return the variable

Step 4- Declare and initialize a list or take input

Step 5- Call the function and print the value returned by it.

PROGRAM:

```
def max_num_in_list( list ):
 max = list[ 0 ]
 for a in list:
        if a > max:
            max = a
 return max
print(max_num_in_list([1, 2, -8, 0]))
```

OUTPUT:

2

RESULT:

Thus the program was executed and verified successfully.

EXPT.NO : 6(C) DATE:	Implementing Programs Using Functions – Area Of Shape

AIM:

To Write a python program to implement area of shape using functions

PROCEDURE:

Step 1:Get the input from the user shape's name.

Step 2:If it exists in our program then we will proceed to find the entered shape's area according to their respective formulas.

Step 3:If that shape doesn't exist then we will print "Sorry!

Step 4:Stop the program

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(f"The area of rectangle is{rect_area}.")
 elif name == "square":
 s = int(input("Enter square's side length: "))
 sqt_area = s * s
 print(f"The area of square is{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(f"The area of triangle is{tri_area}.")
 elif name == "circle":
 r = int(input("Enter circle's radius length: "))
 pi = 3.14
 circ_area = pi * r * r
 print(f"The area of triangle is{circ_area}.")
 elif name == 'parallelogram':
 b = int(input("Enter parallelogram's base length: "))
 h = int(input("Enter parallelogram's height length: "))
```

```
# calculate area of parallelogram
 para_area = b * h
 print(f"The area of parallelogram is{para_area}.")
else:
 print("Sorry! This shape is not available")
if __name__ == "__main__" :
 print("Calculate Shape Area")
shape_name = input("Enter the name of shape whose area you want to find: ")
calculate_area(shape_name)
```

OUTPUT:

```
Calculate Shape Area
Enter the name of shape whose area you want to find: rectangle
Enter rectangle's length: 10
Enter rectangle's breadth: 15
The area of rectangle is 150.
```

RESULT:

Thus the python program to implement area of shape using functions was successfully executed and verified

EXPT.NO : 7(a) DATE:	Implementing programs using Strings –Reverse

AIM:

To Write a python program to implement reverse of a string using string functions

PROCEDURE:

Step 1: start the program

Step 2: Using function string values of arguments passed in that function

Step 3: python string to accept the negative number using slice operation

Step4: to print the reverse string value by Using reverse method function

Step5: print the result

PROGRAM:

```
def reverse(string):
        string = string[::-1]
        return string
s = "Firstyearece"
print ("The original string is : ",end="")
print (s)
print ("The reversed string(using extended slice syntax) is : ",end="")
print (reverse(s))
```

OUTPUT:

```
The original string is : Firstyearece
The reversed string(using extended slice syntax) is : eceraeytsriF
```

RESULT:

Thus the reverse of a string function python program was executed and successfully Verified.

EXPT.NO : 7(B) DATE:	Implementing Programs Using Strings -Palindrome

AIM:

To write a python program to implement palindrome using string functions

PROCEDURE:

Step 1: start by declaring the isPalindrome() function and passing the string argument.

Step 2:Then, in the function body,

Step 3:To get the reverse of the input string using a slice operator – string[::-1].

Step 4: -1 is the step parameter that ensures that the slicing will start from the end of the string with one step back each time.

Step 5:if the reversed string matches the input string, it is a palindrome Or else, it is not a palindrome.

PROGRAM:

```
def isPalindrome(s):
    return s == s[::-1]
# Driver code
s = input("Enter the string=")
ans = isPalindrome(s)
if ans:
    print("the string is palindrome ")
else:
    print("The string is not a palindrome")
```

OUTPUT:

```
Enter a string:madam
The string is a palindrome
```

RESULT:

Thus the program of palindrome by using function in python executed successfully and verified

EXPT.NO : 7(C) DATE:	Implementing programs using Strings - character count

AIM:

To Write a python program to implement Characters count using string functions

PROCEDURE:

Step 1: user to enter the string. Read and store it in a variable.

Step 2: Initialize one counter variable and assign zero as its value.

Step 3: increment this value by 1 if any character is found in the string.

Step 4: Using one loop, iterate through the characters of the string one by one.

Step 5: Check each character if it is a blank character or not. If it is not a blank character, increment the value of the counter variable by '1'.

Step 6: After the iteration is completed, print out the value of the counter.

Step 7: This variable will hold the total number of characters in the string.

PROGRAM:

```
input_string = input("Enter a string : ")
count = 0
for c in input_string :
    if c.isspace() != True:
        count = count + 1
print("Total number of characters : ",count)
```

OUTPUT:

Enter a string : MANAKULA VINAYAGAR INSTITUTE OF TECHNOLOGY

Total number of characters : 38

RESULT:

Thus the program of character count in string in python was executed successfully and verified.

EXPT.NO : 7(d) DATE:	Implementing programs using Strings – Replacing Characters

AIM:

To write a python program to implement Replacing Characters using string functions

PROCEDURE:

Step 1: Using string.replace(old, new, count)

Step 2 : by using string Parameters to change it old – old substring you want to replace.new – new substring which would replace the old substring.

Step 3: count – (Optional) the number of times you want to replace the old substring with the new substring.

Step 4: To returns a copy of the string where all occurrences of a substring are replaced with another substring.

PROGRAM

```
string = "Welcome to python programming"

print(string.replace("to", "our"))

print(string.replace("ek", "a", 3))
```

OUTPUT:

```
Welcome our python programming

Welcome to python praramming
```

RESULT:

Thus the program was executed and successfully verified.

EXPT.NO : 8(a) DATE:	Implementing programs using written modules and Python Standard Libraries–pandas

AIM:

To write a python program to implement pandas modules. Pandas are denote python data structures.

PROCEDURE:

Step 1: start the program

Step 2: DataFrame is the key data structure in Pandas. It allows us to store

And manipulate tabular data

Step 4: python method of DataFrame has data aligned in rows and columns

like the SQL table or a spreadsheet database

Step 3: using Series: It is a 1-D size-immutable array like structure

having homogeneous data in a python module

Step 4:using max function method to display the maximum ages in a program

Step 4:List of elements can be displayed by using output statement in pandas.

Step 5: stop the program

PROGRAM:

In command prompt install this package: pip install pandas

```
import pandas as pd
df = pd.DataFrame(
{
"Name": [ "Braund, Mr. Owen Harris",
"Allen, Mr. William Henry",
"Bonnell, Miss. Elizabeth",],
"Age": [22, 35, 58], "Sex": ["male", "male", "female"],
}
)
print(df)
print(df[“Age”])
ages = pd.Series([22, 35, 58], name="Age”)
print(ages)
df[“Age”].max()
print(ages.max())
print(df.describe())
```

OUTPUT:

```
Name Age Sex
0 Braund, Mr. Owen Harris 22 male
1 Allen, Mr. William Henry 35 male
```

2 Bonnell, Miss. Elizabeth 58 female

0 22

1 35

2 58

Name: Age, dtype: int64

0 22

1 35

2 58

Name: Age, dtype: int64

58

Age

count 3.000000

mean 38.333333

std 18.230012

min 22.000000

25% 28.500000

50% 35.000000

75% 46.500000

max 58.0000

RESULT:

Thus the python program to implement pandas modules. Pandas are

Denote python data structures was successfully executed and verified.

EXPT.NO : 8(b) DATE:	Implementing programs using written modules and Python Standard Libraries– numpy

AIM:

To Write a python program to implement numpy module in python .

Numerical python are mathematical calculations are solved here.

PROCEDURE:

Step 1:start the program

Step 2:to create the package of numpy in python and using array index in numpy for numerical calculation

Step 3:to create the array index inside that index to assign the values in that dimension

Step 4: Declare the method function of arrange statement can be used in that program

Step 5: By using output statement we can print the result

PROGRAM:

In command prompt install this package-pip install numpy

```
import numpy as np
a = np.arange(6)
a2 = a[np.newaxis, :]
a2.shape
#Array Creation and functions:
a = np.array([1, 2, 3, 4, 5, 6])
a = np.array([[1, 2, 3, 4], [5, 6, 7, 8], [9, 10, 11, 12]])
print(a[0])
print(a[1])
np.zeros(2)
np.ones(2)
np.arange(4)
np.arange(2, 9, 2)
np.linspace(0, 10, num=5)
x = np.ones(2, dtype=np.int64)
print(x)
arr = np.array([2, 1, 5, 3, 7, 4, 6, 8])
np.sort(arr)
a = np.array([1, 2, 3, 4])
b = np.array([5, 6, 7, 8])
np.concatenate((a, b))
#Array Dimensions:
array_example = np.array([[[0, 1, 2, 3], [4, 5, 6, 7]], [[0, 1, 2, 3], [4, 5, 6, 7]],
```

```
[[0 ,1 ,2, 3], [4, 5, 6, 7]]])

array_example.ndim

array_example.size

array_example.shape

a = np.arange(6)

print(a)

b=a.reshape(3, 2)

 print(b)

 np.reshape(a, newshape=(1, 6), order='C')
```

OUTPUT:

```
[1 2 3 4]

[5 6 7 8]

[1 1]

[0 1 2 3 4 5]

[[0 1]

[2 3]

[4 5]]
```

RESULT:

Thus the python program to implement numpy module in python .Numerical python are mathematical calculations are successfully executed and verified

EXPT.NO : 8(C) DATE:	Implementing programs using written modules and Python Standard Libraries–matplotlib

AIM:

To write a python program to implement matplotolib module in python. .Matplotlib python are used to show the visualization entities in python.

PROCEDURE:

Step 1:start the program

Step 2: It divided the circle into 4 sectors or slices which represents the respective category(playing, sleeping, eating and working) along with the percentage they hold.

Step 3:Now, if you have noticed these slices adds up to 24 hrs, but the calculation of pie slices is done automatically .

Step 4:In this way, pie charts are calculates the percentage or the slice of the pie in same way using area plot etc using matplotlib

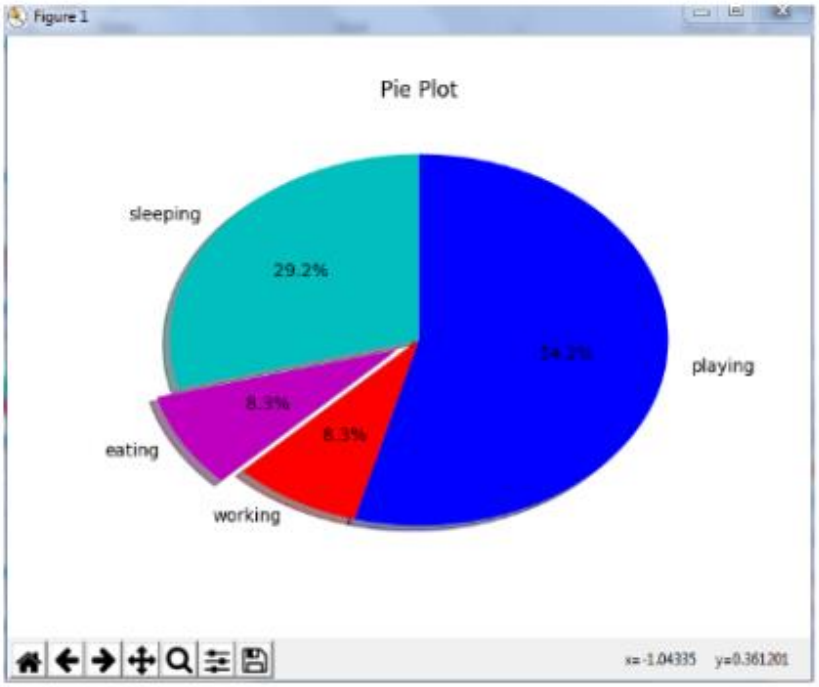
Step 5:stop the program

PROGRAM:

In command prompt install this package: pip install matplotlib

```
import matplotlib.pyplot as plt
days = [1,2,3,4,5]
sleeping =[7,8,6,11,7]
eating = [2,3,4,3,2]
working =[7,8,7,2,2]
playing = [8,5,7,8,13]
slices = [7,2,2,13]
activities = ['sleeping','eating','working','playing']
cols = ['c','m','r','b']
plt.pie(slices,labels=activities, colors=cols,
  startangle=90,
  shadow= True,
  explode=(0,0.1,0,0),
  autopct='%1.1f%%')
plt.title('Pie Plot')
plt.show()
```

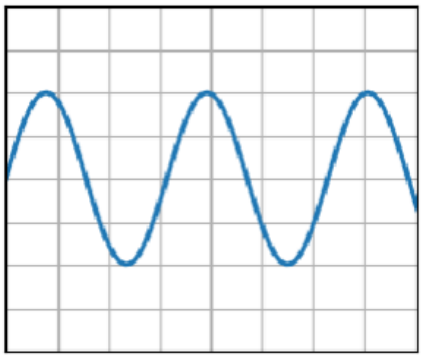
OUTPUT:



PROGRAM 2:

```
import matplotlib.pyplot as plt
import numpy as np
plt.style.use('_mpl-gallery')
x = np.linspace(0, 10, 100)
y = 4 + 2 * np.sin(2 * x)
fig, ax = plt.subplots()
ax.plot(x, y, linewidth=2.0)
ax.set(xlim=(0, 8), xticks=np.arange(1, 8), ylim=(0, 8), yticks=np.arange(1, 8))
plt.show()
```

OUTPUT:



RESULT:

Thus the python program to implement matplotolib module in python. Matplotlib python are used to show the visualization entites in python was successfully executed and verified.

EXPT.NO : 8(d) DATE:	Implementing programs using written modules and Python Standard Libraries– scipy

AIM:

Write a python program to implement scipy module in python. .Scipy python are used to solve the scientific calculations

PROCEDURE:

Step 1:Start the program

Step 2: The SciPy library consists of a subpackage named scipy.interpolate that consists of spline functions and classes, one-dimensional and multi-dimensional (univariate and multivariate) interpolation classes, etc.

Step 3:To import the package of np in a program and create x,x1,y,y1 identifier inside that assign the np function

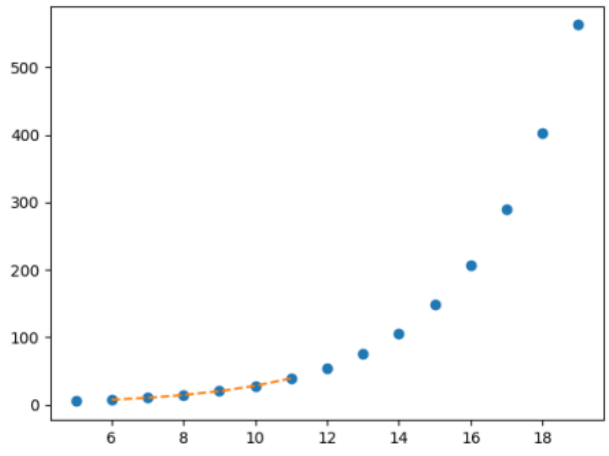
Step 4: SciPy provides interp1d function that can be utilized to produce univariate interpolation

Step 5: Stop the program.

PROGRAM:

```
import matplotlib.pyplot as plt
from scipy import interpolate
import numpy as np
x = np.arange(5, 20)
y = np.exp(x/3.0)
f = interpolate.interp1d(x, y)
x1 = np.arange(6, 12)
y1 = f(x1) # use interpolation function returned by `interp1d`
plt.plot(x, y, 'o', x1, y1, '--')
plt.show()
```

OUTPUT:



RESULT:

Thus the python program to implement Scipy module in python. Scipy python are used to show the visualization entites in python was successfully executed and verified.

EXPT.NO : 9(a) DATE:	**Implementing real-time/technical applications using File handling - copy from one file to another**

AIM:

To Write a python program to implement File Copying

PROCEDURE:

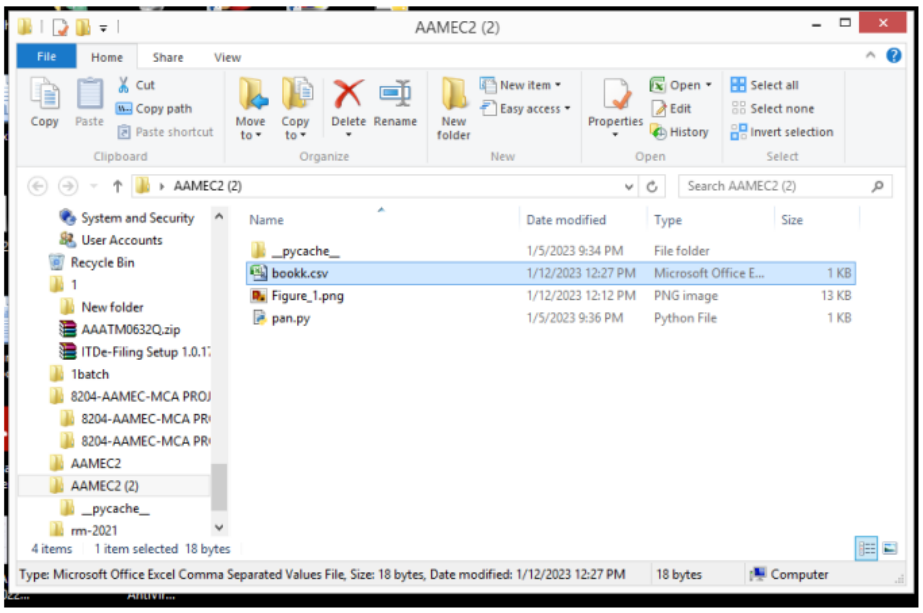
Step 1: Capture the original path

To begin, capture the path where your file is currently stored.

For example, I stored a CSV file in a folder called AAMEC2(2):

C:\Users\Administrator\Desktop\AAMEC2 (2)\bookk.csv

Where the CSV file name is „products„ and the file extension is csv.

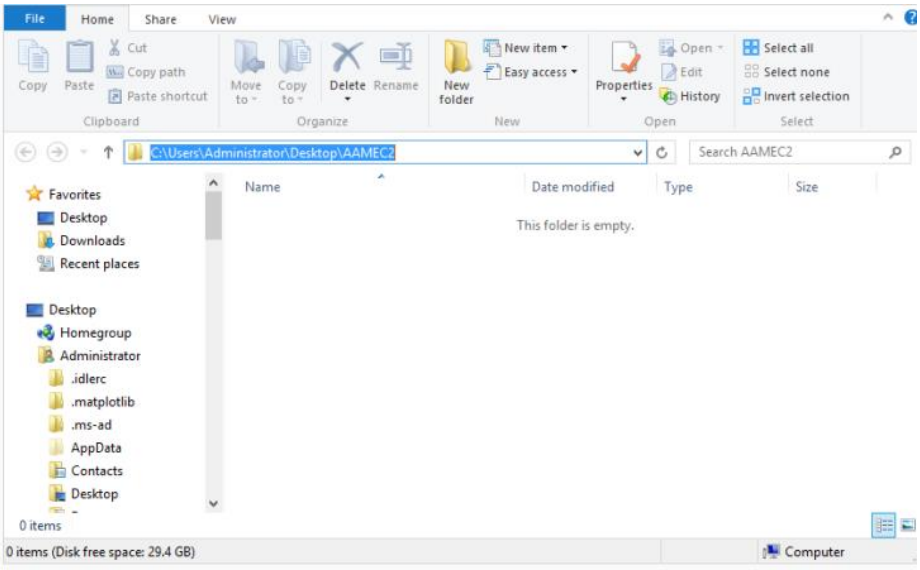


Step 2: Capture the target path

Next, capture the target path where you‟d like to copy the file.

In my case, the file will be copied into a folder called AAMEC2:

C:\Users\Administrator\Desktop \bookk.csv



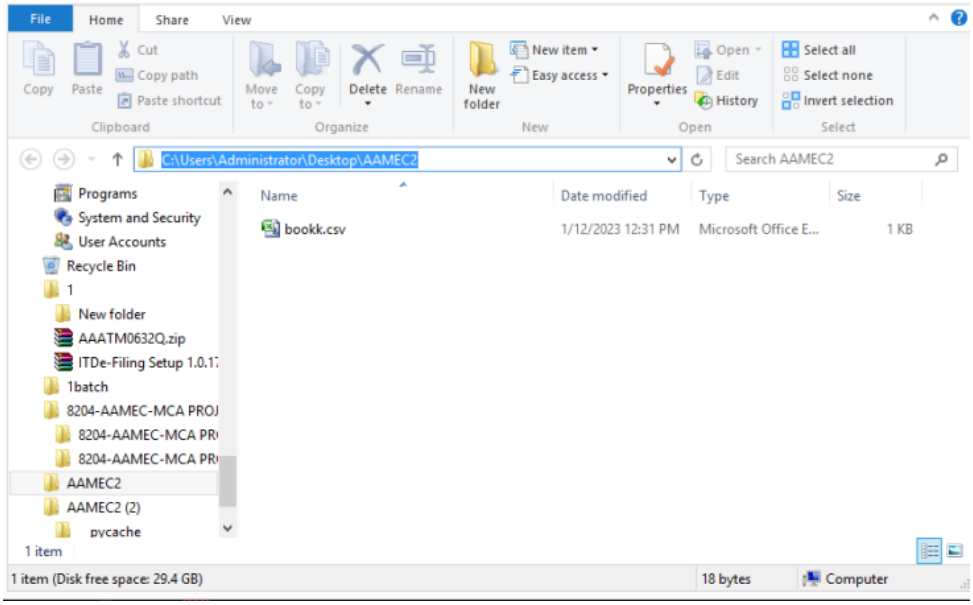
Step 3: Copy the file in Python using shutil.copyfile

import shutil

original = r'C:\Users\Administrator\Desktop\AAMEC2(2)\bookk.csv'

target = r'C:\Users\Administrator\Desktop\AAMEC2\bookk.csv'

shutil.copyfile(original, target) shutil.copyfile(original, target)



RESULT: Thus the a python program to implement File Copying was successfully executed and verified.

EXPT.NO : 9(b) DATE:	**Implementing real-time/technical applications using File handling word count**

AIM:

To Write a python program to implement word count in File operations in python

PROCEDURE:

Step 1: Open and create the txt file with some statements

step 2: To save that file with the extension of txt file

step3 : Now to count the the lenghth of word in a file.

step 4: To display the word count in a target file

PROGRAM:

```
file =open(r"C:\Users\Administrator\Desktop\count2.txt","rt")

data = file.read()

words = data.split()

print('Number of words in text file :', len(words))
```

OUTPUT:

```
Number of words in text file : 4
```

RESULT: Thus the python program to implement word count in File operations in python was executed successfully and verified.

EXPT.NO : 9(c) DATE:	**Implementing real-time/technical applications using File handling - Longest word**

AIM:

To Write a python program to implement longest word in File operations

PROCEDURE:

Step 1: Open and create the txt file with some statements

step 2: To save that file with the extension of txt file

step3 : Now to count the longest of word in a file.

step 4: To display the longest word in a target file

PROGRAM:

```
def longest_word(count):
 with open(count, 'r') as infile:
            words = infile.read().split()
 max_len = len(max(words, key=len))
  return [word for word in words if len(word) == max_len]
print(longest_word('count.txt'))
```

note:

#save the file in same location

OUTPUT:

['welcome', 'program']

RESULT:

Thus the python program to implement longest word in File operations was executed successfully verified.

EXPT.NO : 10(a) DATE:	**Implementing real-time/technical applications using Exception handling.- divide by zero error.**

AIM:

To Write a exception handling program using python to depict the divide by zero error.

PROCEDURE:

step 1: start the program

step 2: The try block tests the statement of error. The except block handle the error.

step 3: A single try statement can have multiple except statements. This is useful when the try block contains statements that may throw different types of exceptions

step 4: To create the two identifier name and enter the values

step 5:by using division operation and if there is any error in that try block raising the error in that block

step 6: otherwise it display the result

PROGRAM:

(i) ZeroDivisionError

```
marks = 10000
a = marks / 0
print(a)
```

OUTPUT: ZeroDivisionError:

(ii)division by zero Program

```
a=int(input("Entre a="))
b=int(input("Entre b="))
try:
  c = ((a+b) / (a-b))
#Raising Error
 if a==b:
        raise ZeroDivisionError
#Handling of error
except ZeroDivisionError:
        print ("a/b result in 0")
else:
        print (c)
```

OUTPUT:

```
Entre a=4
Entre b=6
-5.0
```

RESULT:

Thus the exception handling program using python to depict the divide by zero error. was successfully executed and verified

EXPT.NO : 10(b) DATE:	Implementing real-time/technical applications using Exception handling.- Check voters eligibility

AIM:

To Write a exception handling program using python to depict the voters eligibility

PROCEDURE:

Step 1: Start the program

Step 2:Read the input file which contains names and age by using try catch exception handling method

Step 3:To Check the age of the person. if the age is greater than 18 then write the name into voter list otherwise write the name into non voter list.

Step 4: Stop the program

PROGRAM:

```
def main():
 #get the age
 try:
     age=int(input("Enter your age"))
     if age>18:
          print("Eligible to vote")
     else:
          print("Not eligible to vote")
 except:
         print("age must be a valid number")
main()
```

OUTPUT:

```
Enter your age43
Eligible to vote
```

RESULT:

Thus the exception handling program using python to depict the voters eligibility was successfully executed and verified.

EXPT.NO : 10(c) DATE:	Implementing real-time/technical applications using Exception handling.- student mark range validation

AIM:

To Implementing real-time/technical applications using Exception handling.- student mark range validation

PROCEDURE:

Step 1: Start the program

Step 2:By using function to get the input from the user

Step 3:Using Exception handling in that cif statement can be used to check the mark range in the program

Step 4:Given data is not valid it will throw the IOexception in the process

Step 5: Stop the program

PROGRAM:

```
def main():
    try:
        mark=int(input("enter your mark"))
        if mark>=35 and mark<101:
            print("pass and your mark is valid")
        else:
            print("fail and your mark is valid")
    except ValueError:
        print("mark must be avalid number")
    except IOError:
        print("enter correct valid mark")
    except:
        print("An error occurred")
main()
```

OUTPUT:

Enter your mark 69

Pass and your mark is valid

RESULT:

Thus the real-time/technical applications using Exception handling.- student mark range validation was successfully executed and verified