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| **C:\Users\MCA\Downloads\CREC NEW LOGO (2).jpeg** | **CHADALAWADA RAMANAMMA ENGINEERING COLLEGE****(AUTONOMOUS)****DEPARTMENT OF COMPUTER APPLICATIONS** |

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**1.1 IMPLEMENTING DIFFERENT DATA TYPES**

**Aim :**To write a program to perform different Arithmetic Operations on numbers in Python

**Procedure:**

# Python program to demonstrate numeric value

a = 5

print("Type of a: ", type(a))

b = 5.0

print("\nType of b: ", type(b))

c = 2 + 4j

print("\nType of c: ", type(c))

**OutPut:**

Type of a: <class 'int'>

Type of b: <class 'float'>

Type of c: <class 'complex'>

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| **# Creating a String  with single Quotes** String1 = 'Welcome to the Geeks World'print("String with the use of Single Quotes: ")  print(String1)  # **Creating a String  with double Quotes** String1 = "I'm a Geek"print("\nString with the use of Double Quotes: ")  print(String1)  print(type(String1))     **# Creating a String with triple Quotes** String1 = '''I'm a Geek and I live in a world of "Geeks"'''print("\nString with the use of Triple Quotes: ")  print(String1)  print(type(String1))   **# Creating String with triple Quotes allows multiple lines** String1 = '''Geeks              For              Life'''print("\nCreating a multiline String: ")  print(String1)   |

**Output:**

String with the use of Single Quotes:

Welcome to the Geeks World

String with the use of Double Quotes:

I'm a Geek

<class 'str'>

String with the use of Triple Quotes:

I'm a Geek and I live in a world of "Geeks"

<class 'str'>

Creating a multiline String:

Geeks

 For

 Life

**#Python Program to Access characters of String**

String1 = "GeeksForGeeks"

print("Initial String: ")

print(String1)

**# Printing First character**

print("\nFirst character of String is: ")

print(String1[0])

**# Printing Last character**

print("\nLast character of String is: ")

print(String1[-1])

Initial String:

GeeksForGeeks

First character of String is:

G

Last character of String is:

s

**# Python program to demonstrate Creation of List**

**# Creating a List**

List = []

print("Intial blank List: ")

print(List)

**# Creating a List with the use of a String**

List = ['GeeksForGeeks']

print("\nList with the use of String: ")

print(List)

**# Creating a List with the use of multiple values**

List = ["Geeks", "For", "Geeks"]

print("\nList containing multiple values: ")

print(List[0])

print(List[2])

**# Creating a Multi-Dimensional List (By Nesting a list inside a List)**

List = [['Geeks', 'For'], ['Geeks']]

print("\nMulti-Dimensional List: ")

print(List)

**Output:**

Intial blank List:

[]

List with the use of String:

['GeeksForGeeks']

List containing multiple values:

Geeks

Geeks

Multi-Dimensional List:

[['Geeks', 'For'], ['Geeks']]

|  |
| --- |
| **Python program to demonstrate accessing of element from list** **# Creating a List with the use of multiple values** List = ["Geeks", "For", "Geeks"]  **# accessinga element from the list using index number** print("Accessing element from the list")  print(List[0])   print(List[2])    **# accessinga element using negative indexing** print("Accessing element using negative indexing")  **# print the last element of list** print(List[-1])      **# print the third last element of list** print(List[-3])   |

**Output:**

Accessing element from the list

Geeks

Geeks

Accessing element using negative indexing

Geeks

Geeks

**Python program to demonstrate creation of Set**

# Creating an empty tuple

Tuple1 = ()

print("Initial empty Tuple: ")

print (Tuple1)

**# Creating a Tuple with the use of Strings**

Tuple1 = ('Geeks', 'For')

print("\nTuple with the use of String: ")

print(Tuple1)

**# Creating a Tuple with the use of list**

list1 = [1, 2, 4, 5, 6]

print("\nTuple using List: ")

print(tuple(list1))

**# Creating a Tuple with the use of built-in function**

Tuple1 = tuple('Geeks')

print("\nTuple with the use of function: ")

print(Tuple1)

**# Creating a Tuple with nested tuples**

Tuple1 = (0, 1, 2, 3)

Tuple2 = ('python', 'geek')

Tuple3 = (Tuple1, Tuple2)

print("\nTuple with nested tuples: ")

print(Tuple3)

**Output:**

Initial empty Tuple:

()

Tuple with the use of String:

('Geeks', 'For')

Tuple using List:

(1, 2, 4, 5, 6)

Tuple with the use of function:

('G', 'e', 'e', 'k', 's')

Tuple with nested tuples:

((0, 1, 2, 3), ('python', 'geek'))

**# Python program to demonstrate accessing tuple**

 tuple1 = tuple([1, 2, 3, 4, 5])

**# Accessing element using indexing**

print("Frist element of tuple")

print(tuple1[0])

**# Accessing element from last negative indexing**

print("\nLast element of tuple")

print(tuple1[-1])

print("\nThird last element of tuple")

print(tuple1[-3])

**Output:**

Frist element of tuple

1

Last element of tuple

5

Third last element of tuple

3

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| **# Python program to demonstrateboolean type** print(type(True)) print(type(False))   print(type(true))  |

**Output:**

<class 'bool'>

<class 'bool'>

Traceback (most recent call last):

 File "/home/7e8862763fb66153d70824099d4f5fb7.py", line 8, in

 print(type(true))

NameError: name 'true' is not defined

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| **# Python program to demonstrate Creation of Set in Python**   #Creating a Set  set1 = set()  print("Intial blank Set: ")  print(set1)    **# Creating a Set with the use of a String** set1 = set("GeeksForGeeks")  print("\nSet with the use of String: ")  print(set1)  **# Creating a Set with the use of a List** set1 = set(["Geeks", "For", "Geeks"])  print("\nSet with the use of List: ")  print(set1)    **# Creating a Set with** **# a mixed type of values** # (Having numbers and strings)  set1 = set([1, 2, 'Geeks', 4, 'For', 6, 'Geeks'])  print("\nSet with the use of Mixed Values")  print(set1)   |

**Output:**

Intial blank Set:

set()

Set with the use of String:

{'F', 'o', 'G', 's', 'r', 'k', 'e'}

Set with the use of List:

{'Geeks', 'For'}

Set with the use of Mixed Values

{1, 2, 4, 6, 'Geeks', 'For'}

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| **# Creating an empty Dictionary** Dict = {}  print("Empty Dictionary: ")  print(Dict)  **# Creating a Dictionary with Integer Keys** Dict = {1: 'Geeks', 2: 'For', 3: 'Geeks'}  print("\nDictionary with the use of Integer Keys: ")  print(Dict)  **# Creating a Dictionary with Mixed keys** Dict = {'Name': 'Geeks', 1: [1, 2, 3, 4]}  print("\nDictionary with the use of Mixed Keys: ")  print(Dict)  **# Creating a Dictionary with dict() method**  Dict = dict({1: 'Geeks', 2: 'For', 3:'Geeks'})  print("\nDictionary with the use of dict(): ")  print(Dict)      **# Creating a Dictionary  with each item as a Pair** Dict = dict([(1, 'Geeks'), (2, 'For')])  print("\nDictionary with each item as a pair: ")  print(Dict)   |

**Output:**

Empty Dictionary:

{}

Dictionary with the use of Integer Keys:

{1: 'Geeks', 2: 'For', 3: 'Geeks'}

Dictionary with the use of Mixed Keys:

{1: [1, 2, 3, 4], 'Name': 'Geeks'}

Dictionary with the use of dict():

{1: 'Geeks', 2: 'For', 3: 'Geeks'}

Dictionary with each item as a pair:

{1: 'Geeks', 2: 'For'}

**1.2 IMPLEMENTING ARITHMETIC OPERATIONS**

**Aim:** To write a program to perform different Arithmetic Operations on numbers in Python

**Procedure:** num1 = int(input('Enter First number: '))

num2 = int(input('Enter Second number '))

add = num1 + num2

dif = num1 - num2

mul = num1 \* num2

div = num1 / num2

floor\_div = num1 // num2

power = num1 \*\* num2

modulus = num1 % num2

print('Sum of ',num1 ,'and' ,num2 ,'is :',add)

print('Difference of ',num1 ,'and' ,num2 ,'is :',dif)

print('Product of' ,num1 ,'and' ,num2 ,'is :',mul)

print('Division of ',num1 ,'and' ,num2 ,'is :',div)

print('Floor Division of ',num1 ,'and' ,num2 ,'is :',floor\_div)

print('Exponent of ',num1 ,'and' ,num2 ,'is :',power)

print('Modulus of ',num1 ,'and' ,num2 ,'is :',modulus)

**Out Put:**

**Enter First number: 10**

**Enter Second number 5**

Sum of 10 and 5 is : 15

Difference of 10 and 5 is : 5

Product of 10 and 5 is : 50

Division of 10 and 5 is : 2.0

Floor Division of 10 and 5 is : 2

Exponent of 10 and 5 is : 100000

Modulus of 10 and 5 is : 0

***2.1 FINDING PRIME NUMBER***

**Aim:** To Write a Python program to find first n prime numbers.

**Source Code:**

Num=int(input("Enter range:"))

print("Prime numbers:",end=' ')

for n in range(1,numr):

    for i in range(2,n):

        if(n%i==0):

            break

    else:

        print(n,end=' ')

**Output:**

Enter range: 50

Prime numbers: 1 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47

**2.2 FINDING MAXIMUM ELEMENT**

**Ai****m:** To Write a Python Program to find the maximum from a list of numbers.

**Source Code:**

|  |
| --- |
| list1 = [10, 20, 4, 45, 99] # printing the maximum element print("Largest element is:", max(list1))  |

**Output:**

Largest element is: 99

**3.1 FINDING GCD OF TWO NUMBERS**

**Aim:** To Write a Python program to find GCD of two numbers**.**

**Procedure:**

**Method1:**

#python program to find GCD of Two Numbers using While loop

Num1=int(input("Enter first number:"))

Num2=int(input("Enter second number:"))

I=1

while(I<=Num1 and I<=Num2):

if(Num1%I==0 and Num2%I==0):

Gcd=I

 I=I+1

print("GCD is",Gcd)

**input:**

5

15

**Output:**

5

**Method 2:**

**Source Code:**

# Python code to demonstrate the working of gcd()

# importing "math" for mathematical operations

import math

# prints 12

print("The gcd of 60 and 48 is : ", end="")

print(math.gcd(60, 48))

**Output:**

The gcd of 60 and 48 is : 12

**Method 3:**

**Source Code:**

# Python code to demonstrate naive

# method to compute gcd( recursion )

def hcf(a, b):

    if(b == 0):

        return a

    else:

        return hcf(b, a % b)

a = 60

b = 48

  # prints 12

print("The gcd of 60 and 48 is : ", end="")

print(hcf(60, 48))

**Output**

The gcd of 60 and 48 is : 12

**3.2 FINDING THE SQUARE OF A NUMBER**

**Aim:** To Write a Python Program to find the square root of a number by Newton’s Method.

**Source Code:**

def newton\_method(number, number\_iters = 100):

    a = float(number)

    for i in range(number\_iters):

        number = 0.5 \* (number + a / number)

    return number

a=int(input("Enter first number:"))

b=int(input("Enter second number:"))

print("Square root of first number:",newton\_method(a))

print("Square root of second number:",newton\_method(b))

**Output:**

Enter first number:81

Enter second number:5

Square root of first number: 9.0

Square root of second number: 2.23606797749979

**4.1 MULTIPLICATION OF TWO MATRICES**

**Aim:** To Write a Python program to multiply matrices.

**Source Code:** Program to multiply two matrices using nested loops

# 3x3 matrix

X = [[12,7,3],

 [4 ,5,6],

 [7 ,8,9]]

# 3x4 matrix

Y = [[5,8,1,2],

 [6,7,3,0],

 [4,5,9,1]]

# result is 3x4

result = [[0,0,0,0],

 [0,0,0,0],

 [0,0,0,0]]

# iterate through rows of X

for i in range(len(X)):

 # iterate through columns of Y

 for j in range(len(Y[0])):

 # iterate through rows of Y

for k in range(len(Y)):

 result[i][j] += X[i][k] \* Y[k][j]

for r in result:

 print(r)

**Output**

[114, 160, 60, 27]

[74, 97, 73, 14]

[119, 157, 112, 23]

**Method 2:**

# Program to multiply two matrices using list comprehension

# take a 3x3 matrix

A = [[12, 7, 3],

    [4, 5, 6],

    [7, 8, 9]]

# take a 3x4 matrix

B = [[5, 8, 1, 2],

    [6, 7, 3, 0],

    [4, 5, 9, 1]]

# result will be 3x4

result = [[sum(a \* b for a, b in zip(A\_row, B\_col))

                        for B\_col in zip(\*B)]

                                for A\_row in A]

for r in result:

    print(r)

**Output:**

[114, 160, 60, 27]

[74, 97, 73, 14]

[119, 157, 112, 23]

**4.2 PRINT EACH LINE OF A FILE IN REVERSE ORDER**

**Aim:** Write a program to print each line of a file in reverse order.

**Source Code:**

input\_file=open('D:/a.txt','r')

for line in input\_file:

 l=len(line)

 s=' '

 while(l>=1):

 s=s+line[l-1]

 l=l-1

 print(s)

input\_file.close()

**Execution:**

**Input:**

a.txt file contains khit

**Output:**

tihk

**5.1 CONVERT A LIST OF TUPLES IN A DICTIONARY**

**Aim:** To Write a program to convert a list of tuples in a dictionary.

**Source Code:**

# Python code to convert into dictionary

def Convert(tup, di):

    for a, b in tup:

        di.setdefault(a, []).append(b)

    return di

# Driver Code

tups = [("akash", 10), ("gaurav", 12), ("anand", 14),

     ("suraj", 20), ("akhil", 25), ("ashish", 30)]

dictionary = {}

print (Convert(tups, dictionary))

Output:

{'akash': [10], 'gaurav': [12], 'anand': [14],

 'ashish': [30], 'akhil': [25], 'suraj': [20]}

|  |
| --- |
| # Python code to convert into dictionarylist\_1=[("Nakul",93), ("Shivansh",45), ("Samved",65),           ("Yash",88), ("Vidit",70), ("Pradeep",52)]dict\_1=dict()  for student,score in list\_1:    dict\_1.setdefault(student, []).append(score)print(dict\_1) |

**Output:**

{'Nakul': [93], 'Shivansh': [45], 'Samved': [65], 'Yash': [88], 'Vidit': [70], 'Pradeep': [52]}

**5.2 TUPLE IMPLEMENTATION**

**Aim:** To Write a Python program to check whether an element exists within a tuple.

**Source Code:**

|  |
| --- |
| Python3 code to demonstrate working of# Check if element is present in tuple# using loop  # initialize tupletest\_tup = (10, 4, 5, 6, 8)  # printing original tupleprint("The original tuple : " + str(test\_tup))  # initialize N N = 6  # Check if element is present in tuple# using loopres = False for ele in test\_tup :    if N == ele :        res = True        break  # printing resultprint("Does tuple contain required value ? : " + str(res)) |

**Output :**

The original tuple : (10, 4, 5, 6, 8)

Does tuple contain required value ? : True

**Method 2**

|  |
| --- |
| # Python3 code to demonstrate working of Check if element is present in tuple Using in operator  # initialize tupletest\_tup = (10, 4, 5, 6, 8)  # printing original tupleprint("The original tuple : " + str(test\_tup))  # initialize N N = 6  # Check if element is present in tuple# Using in operatorres = N in test\_tup  # printing resultprint("Does tuple contain required value ? : " + str(res)) |

**Output :**

The original tuple : (10, 4, 5, 6, 8)

Does tuple contain required value ? : True

**6.1 LIST IMPLEMENTATION**

**Aim:** To write a function dups to find all duplicates in the list.

**Source Code:**

def find\_duplicates(list\_of\_numbers):

 #start writing your code here

 x=set(list\_of\_numbers)

 y=[]

 dup=[]

 count=0

 for i in x:

y.append(i)

 for i in y:

 for j in list\_of\_numbers:

 if(j==i):

 count+=1

 if count>=2:

dup.append(i)

 break

 count=0

 return dup

list\_of\_numbers=[1,2,3,5,2,3,4]

list\_of\_duplicates=find\_duplicates(list\_of\_numbers)

print(“duplicte elements are:”, list\_of\_duplicates)

**Output:**

**duplicate elements are: [2, 3]**

**6.2 CUMULATIVE PRODUCT OF A LIST OF NUMBERS**

**Aim:**Write a function cumulative product to compute cumulative product of a list of numbers.

**SourceCode:**

list = [1, 2, 3, 4, 5]

curr = 1

out = [(curr:=curr\*v) for v in list]

print(out)

**Output:**

[1, 2, 6, 24, 120]

**7.1 DICTIONARY IMPLEMENTATION**

**Aim:** To Write a Python script to concatenate following dictionaries to create a new one.

**Source Code:**Sample Dictionary :

dic1={1:10, 2:20}

dic2={3:30, 4:40}

dic3={5:50,6:60}

**Procedure:**

dic1={1:10, 2:20}

dic2={3:30, 4:40}

dic3={5:50,6:60}

dic4 = {}

for d in (dic1, dic2, dic3): dic4.update(d)

print(dic4)

**Output:**

{1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}

**7.2 REPLACINING DICTIONARIES VALUES**

**Aim:**To Write a Python program to replace dictionary values with their average.

**Source Code:**

def sum\_math\_v\_vi\_average(list\_of\_dicts):

for d in list\_of\_dicts:

 n1 = d.pop('V')

 n2 = d.pop('VI')

 d['V+VI'] = (n1 + n2)/2

 return list\_of\_dicts

student\_details= [

 {'id' : 1, 'subject' : 'math', 'V' : 70, 'VI' : 82},

 {'id' : 2, 'subject' : 'math', 'V' : 73, 'VI' : 74},

 {'id' : 3, 'subject' : 'math', 'V' : 75, 'VI' : 86}

]

print(sum\_math\_v\_vi\_average(student\_details))

**Output:**

[{'subject': 'math', 'id': 1, 'V+VI': 76.0}, {'subject': 'math', 'id': 2, 'V+VI': 73.5}, {'subject': 'math', '

id': 3, 'V+VI': 80.5}]

**8.1FILE IMPLEMENTATION**

**Aim:** Write a python program to read characters data from a textfile by using the following methods

1. Read() 2).Read(n) 3.) Readline() 4) Readlines()

**SourceCode:**

**1.read()**

**Source Code:**

f=open("abc.txt",'r')

data=f.read()

print(data)

f.close()

**Output:**

Hai

Welcome to Bangalore

Green city of India

Upendra my fav actor

**2.read(n)**

f=open("abc.txt",'r')

data=f.read(11)

print(data)

f.close()

**Output:**

Hai

Welcom

**3.readline()**

f=open("abc.txt",'r')

line1=f.readline()

print(line1,end='')

line2=f.readline()

print(line2,end='')

line3=f.readline()

print(line3,end='')

f.close()

**Output:**

Hai

Welcome to Bangalore

Green city of India

**4.readlines()**

f=open("abc.txt",'r')

lines=f.readlines()

for line in lines:

 print(line,end='')

f.close()

**Output:**

Hai

Welcome to Bangalore

Green city of India

Upendra my fav actor

**8.2 FILE IMPLEMENTATION**

**Aim:** Write a program to print number of lines, words& characters present in the given file.

**Source Code:**

**abc.txt #text file**

Hai

Welcome to Bangalore

Green city of India

Upendra my fav actor

**File.py #python file**

import os,sys

fname=input("enter file name:")

if os.path.isfile(fname):

print("file exists:",fname)

 f=open(fname,"r")

else:

print("file does not exists:",fname)

sys.exit(0)

Lcount=Wcount=Ccount=0

for line in f:

Lcount=Lcount+1

Ccount=Ccount+len(line)

 words=line.split()

Wcount=Wcount+len(words)

print("the number of lines:",Lcount)

print("the number of words:",Wcount)

print("the number of characters:",Ccount)

**Output:**

enter file name:abc.txt

file exists: abc.txt

the number of lines: 4

the number of words: 12

the number of characters: 67

**9.1 INSATANCE VARIABLE IMPLEMENTATION**

**Aim:** Write a program to describe about instance variable using ATM machine class

**Source code:**

class ATM:

 def \_\_init\_\_(self):

self.balance=0

print("New account created")

 def deposit(self):

 amount=float(input("Enter the amount to deposit:"))

self.balance +=amount

print("New balance is",amount)

 def withdraw(self):

 amount=float(input("enter the amount to withdraw:"))

 if self.balance>=amount:

self.balance-=amount

print("\n you withdraw:",amount)

 else:

self.balance=self.balance-amount

print("Insufficient balance:",self.balance)

 def enquiry(self):

print("The balance is",self.balance)

a=ATM()

a.deposit()

a.withdraw()

a.withdraw()

a.enquiry()

**Output**

New account created

Enter the amount to deposit:15000

New balance is 15000.0

enter the amount to withdraw:12000

you withdraw: 12000.0

enter the amount to withdraw:5000

Insufficient balance: -2000.0

The balance is -2000.0

**9.2 CLASS IMPLEMENTATION**

**Aim:** Write a program to describe about Class variable using Robot Class

**Source Code:**

class Robot:

what="Machine" #class variable

name="Chitti"

version=1.0

speed="1THZ"

memory="1ZB"

def update(cls):

cls.version=2.0

cls.speed="2THZ"

cls.memory="2ZB"

r=Robot()

print("Hai iam a",r.what)

print("MY name is",r.name)

print("Version",r.version)

print("Speed",r.speed)

print("Memory",r.memory)

r.update()

print("")

print("Hai iam a",r.what)

print("MY name is",r.name)

print("Version",r.version)

print("Speed",r.speed)

print("Memory",r.memory)

**Output:**

Hai iam a Machine

MY name is Chitti

Version 1.0

Speed 1THZ

Memory 1ZB

Hai iam a Machine

MY name is Chitti

Version 2.0

Speed 2THZ

Memory 2ZB

**10.1 STATIC , INSATANCE VARIABLE IMPLEMENTATION**

**Aim:** Write a python program to access static and instance variables in a class

**Source code:**

import sys

class Customer:

bankname='Indian bank'

 def \_\_init\_\_(self,name,balance=0.0):

 self.name=name

self.balance=balance

 def deposit(self,amt):

self.balance=self.balance+amt

print("balance after deposit",self.balance)

 def withdraw(self,amt):

 if amt>self.balance:

print("Insufficient funds...")

sys.exit()

self.balance=self.balance-amt

print("balance after withdraw..",self.balance)

print('Welcome to:',Customer.bankname)

name=input("Enter your name:")

c=Customer(name)

while True:

print("d-Deposit\n w-Withdraw\n e-Exit")

 option=input("Choose your option:")

 if option=='d' or option=='D':

 amt=float(input("Enter amount:"))

c.deposit(amt)

elif option=='w' or option=='W':

 amt=float(input("Enter amount:"))

c.withdraw(amt)

elif option=='e' or option=='E':

print("Thanks for banking")

sys.exit()

 else:

print("Invalid option...plse choose valid option")

**Output:**

Welcome to: Indian bank

Enter your name:harish

d-Deposit

 w-Withdraw

 e-Exit

Choose your option:d

Enter amount:10000

balance after deposit 10000.0

d-Deposit

 w-Withdraw

 e-Exit

Choose your option:w

Enter amount:8000

d-Deposit

 w-Withdraw

 e-Exit

Choose your option:s

Invalid option...plse choose valid option

d-Deposit

 w-Withdraw

 e-Exit

Choose your option:

**10.2 EXCEPTION HANDLING**

**Aim:**Write a python program to demonstrate the user defined and pre defined exceptions

**Source Code:**

class TooYoungException(Exception):

 def \_\_init\_\_(self,arg):

 self.msg=arg

class TooOldException(Exception):

 def \_\_init\_\_(self,arg):

 self.msg=arg

age=int(input("Enter Age:"))

if age>60:

 raise TooYoungException("Plz wait some more time you will get best match soon!!!")

elif age<18:

 raise TooOldException("Your age already crossed marriage age...")

else:

print("You will get match details soon by email!!!")

**Output:**

Enter Age:14

Traceback (most recent call last):

 File "D:/python/SL LAB/exception.py", line 11, in <module>

 raise TooOldException("Your age already crossed marriage age...")

TooOldException: Your age already crossed marriage age...

Enter Age:65

Traceback (most recent call last):

 File "D:/python/SL LAB/exception.py", line 9, in <module>

 raise TooYoungException("Plz wait some more time you will get best match soon!!!")

TooYoungException: Plz wait some more time you will get best match soon!!!

Enter Age:27

You will get match details soon by email!!!