18CSC207J- Advanced Programming Practices

Record Work

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Certified to be the bonafide record of work done by Gaurav Raj of CSE-SWE T1 , B. Tech Degree course in the Practical 18CSC207J- Advanced Programming Practices in SRM Institute of Science and Technology, Kattankulathur during the academic year 2021-2022.

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Examiner-1

Examiner-2

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18CSC207J-Advanced Programming Practice
SRM Institute of Science & Engineering- Kattankulathur
Campus School of Computing

Aim: To implement Structured Programming Paradigm

Problem:

Write a Python program to find those numbers which are divisible by 8 and multiple of 5, between 1000 and 2000 (both included)

Algorithm:

Step 1: Iterate in range from 1000 to 2000
Step 2: For each iteration check if the number is divisible by 5 and 8 Step 3:
Print the numbers if the above condition is true.

Program:

```
n=[]                    #declaring variable for x_882 in range(1000,2000):     #for loop of x_882 in the range
1000 and 2000
(inclusive)    if (x_882%8==0) and (x_882%5==0):   #if x_882 is divisible by 8 and 5
      n.append(str(x_882))       #add x_882 into n print(','.join(n))           #after comma join
the upcoming numbers
```

Input/Output

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\q1.py"
1000,1040,1080,1120,1160,1200,1240,1280,1320,1360,1400,1440,1480,1520,1560,
1600,1640,1680,1720,1760,1800,1840,1880,1920,1960
```

Problem:

Write a Python program to guess a number between 1 to 9. Note : User is prompted to enter a guess. If the user guesses wrong then the prompt appears again until the guess is correct, on successful guess, user will get a "Well guessed!" message, and the program will exit.

Algorithm:

Step 1: Import random as header file
Step 2: Input a number

Step 3: Guess a number between 1 and 10 randomly using inbuilt function
Step 4: Check if input number and random is matched
Step 5: Print well guessed if condition is true
Step 6: Repeat the above process of 2.

Program:

```
import random                                                    #imprting function to generate random numbers
n_882 , guess_882 = random.randint(1,10),0          # declaring variable and generating random int
while n_882!=guess_882:                                                    # while loop till n not equal to guess
                                    guess_882=int(input("guess a number between 1 to 10 until u get it right:")) #convert
the input into an integer data type print("guessed well!!")     #prints this when the guess is right
```

Problem:

Write a Python program to construct the following pattern, using a nested for loop.

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* * *
```

Algorithm:

Step 1: Break the pattern into 2 parts.
Step 2: Iterate for the above part for 5 times using i
Step 3: Iterate for in range 0 to I and print * Step 4:
Iterate for second half for 4 times.
Step 5: Iterate in reverse manner from I to 0 Step 6:
print *

Program:

```
n_882=5 for i in
range(n_882):                                   #for loop, i from 0 to n
    for j in range(i):                          #j from 0 to i
            print('* ',end="")                  #print '*' one after the other
    print('')                                   #change line

for i in range(n_882,0,-1):                     #i from 5 to 0, decreement
    for j in range(i):                          #j from 0 to i
            print('* ',end="")
    print("")
```

Input/Output

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\tempCodeRunnerFile.py"

*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

Problem:

Write a Python program that accepts a word from the user and reverse it. (should not use any functions)

Algorithm:

Step 1: Input a word
Step 2: Reverse the word iterating each character and use the syntax in for loop.
Step 3: Print the word Program:

```
word_882 = input("Input a word to reverse: ")
for char in range(len(word_882) - 1, -1, -1):  #char from last letter till -1, decreement   print(word_882[char], end="")
#print word the letter one after the other
print("\n")                                                #change line
```

Input/Output

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\tempCodeRunnerFile.py"
Input a word to reverse: nikhil
lihkin
```

Problem:

Write a Python program which takes two digits m (row) and n (column) as input and generates a two-dimensional array. The element value in the i-th row and j-th column of the array should be i*j. Note :
i = 0,1.., m-1 j
= 0,1, n-1.

Test Data : Rows = 3, Columns = 4
Expected Result : [[0, 0, 0, 0], [0, 1, 2, 3], [0, 2, 4, 6]]

Algorithm:

Step 1: Input rows(m) and column (n)
Step 2: Initialize a result array
Step 3: Iterate in rows(m) and for each row iterate in column (n)
Step 4: Calculating i*j
Step 5: print the resultant array Program:

```
row_num = int(input("Input number of rows: "))  #number of rows and columns col_num =
int(input("Input number of columns: ")) array = [[0 for col in range(col_num)] for row in
range(row_num)] #creates array for row in range(row_num):
    for col in range(col_num):
        array[row][col]= row*col

print(array)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\q5.py"
Input number of rows: 3
Input number of columns: 4
[[0, 0, 0, 0], [0, 1, 2, 3], [0, 2, 4, 6]]
```

Problem:

Write a Python program that accepts a string and calculate the number of digits and letters.

Algorithm:

Step 1: Input a string
Step 2: Intialize d and l as 0
Step 3: Traverse as character in string
Step 4: Check if the current character in digit
Step 5: If it in digit increment d else d
Step 6: Print d and l

Program:

```
s = input("Input a string")    #takes an input d=l=0                    for c in s:                #for a
letter/character in string    if c.isdigit():          #using the function to check is c is a digit       d=d+1
#adding the value    elif c.isalpha():         #using the function to check is c is a alpha       l=l+1
else:       pass
print("Letters", l) print("Digits", d)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\q6.py"
Input a stringsrmist2022
Letters 6
Digits 4
```

Problem:

Write a Python program to check the validity of password input by users. Validation :

- At least 1 letter between [a-z] and 1 letter between [A-Z].
- At least 1 number between [0-9].
- At least 1 character from [$#@].

- Minimum length 6 characters.
- Maximum length 16 characters.

Algorithm:

Step 1: Input a password as string
Step 2: Iterate in range 0 to string length
Step 3: Check for validation and conditions one by one
Step 4: If all are true print “Valid Password” else “Not Valid Password”

Program:

```
l, u, p, d = 0, 0, 0, 0 s = input("Input a string: ")
if (len(s) >= 8) and (len(s) <= 16):     for i in s:


      if (i.islower()):
         l+=1
        if (i.isupper()):
         u+=1
       if (i.isdigit()):
         d+=1
       if(i=='@'or i=='$' or i=='_' or i=='!'):
         p+=1
 if (l>=1 and u>=1 and p>=1 and d>=1 and l+p+u+d==len(s)):
   print("Valid Password") else:
   print("Invalid Password")
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\q7.py"
Input a string: srmist@2017
Invalid Password
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\q7.py"
Input a string: Srmist@2022
Valid Password
```

Problem:

Write a Python program to find numbers between 100 and 400 (both included) where each digit of a number is an even number. The numbers obtained should be printed in a commaseparated sequence.

Algorithm:

Step 1: Iterate from 100 to 400
Step 2: Extract each digit and check for even
Step 3: If yes, the print the digits of numbers \ Step 4:
Continue with step 1 again till upon time.

Program:

```
items = [] for i in range(100,
401):
   s = str(i)     if (int(s[0])%2==0) and (int(s[1])%2==0) and (int(s[2])%2==0):    #convert into int and check if each
digit is divisible by 2          items.append(s) print( ",".join(items))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\tempCodeRunnerFile.py"
200,202,204,206,208,220,222,224,226,228,240,242,244,246,248,260,262,264,266
,268,280,282,284,286,288,400
```

Problem:

Write a Python program to convert month name to a number of days.

Algorithm:

Step 1: Input the name of month
Step 2: Check if the month is feb, print 28/29 days

Step 3: Check if the month is Jan, March, May, August, print (31 days) Step 4:
Check if month in April ,June ,September ,November print 30 days.

Program:

```
month_name = input("Input the name of Month: ")
 if month_name == "February":
    print("No. of days: 28/29 days") elif month_name in ("April", "June",
"September", "November"):
    print("No. of days: 30 days") elif month_name in ("January", "March", "May", "July", "August", "October",
"December"):
    print("No. of days: 31 day") else:
    print("Wrong month name")
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\tempCodeRunnerFile.py"
Input the name of Month: January
No. of days: 31 day
```

Problem:

Write a Python program to sum of two given integers. However, if the sum is between 105 to 200 it will return 200.

Algorithm:

Step 1: Take 2 Integer as input

Step 2: Sum them up in sum 1
Step 3: If sum ties in range of 105 and 200
Step 4: else print sum1

Program:

```
a = int(input("Enter the first number: "))
b = int(input("Enter the second number: "))
sum= a+ b
if sum in range(105, 200):
    print(200)
else
    print(sum)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\q10.py"
Enter the first number: 106
Enter the second number: 20
200
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\q10.py"
Enter the first number: 20
Enter the second number: 80
100
```

Problem:

Write a Python program to construct the following pattern, using a nested loop number.
Expected Input/Output:
999999999
88888888
7777777
666666
55555
4444
333
22
1

Algorithm:

Step 1: Take for loop and iterate for number of lives
Step 2: Iterating for 10 to i-1 in reverse direction
Step 3: Print values of 9-i

Program:

```
for i in range(9,0,-1):
```

```
print(str(i) * i)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\q11.py"
999999999
88888888
7777777
666666
55555
4444
333
22
1
```

Problem:

Write a Python program to create a histogram from a given list of integers

Algorithm:

Step 1: Define a function histogram and iterate with n on items
Step 2: Take variable time and iterate for times and print *
Step 3: Reduce times by 1
Step 4: Print Output
Step 5: Call the functions with histogram [2,3,6,5]

Program:

```
def histogram( items ):    for n in
items:        Input/Output = ''
times = n        while( times > 0 ):
Input/Output += '*'        times =
times - 1        print(Input/Output)

histogram([2, 3, 6, 5])
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\q12.py"
**
***
******
*****
```

Problem:

Write a Python program that will return true if the two given integer values are equal or their sum or difference is 5.

Algorithm:

Step 1: Create a function taking two inputs
Step 2: Check if condition if x==y or if absolute difference is 5 or if their sum is 5.
Step 3: If the condition is fulfilled, print true
Step 4: else print false

Program:

```
x = int(input("Enter the first number: ")) y =
int(input("Enter the second number: ")) if x == y or abs(x-
y) == 5 or (x+y) == 5:
   print("True") else:
   print("False")
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\P
ython-1\A1\q13.py"
Enter the first number: 10
Enter the second number: 25
False
```

Problem:

Write a Python program to compute the distance between the points (x1, y1) and (x2, y2).
Algorithm:

Step 1:Input 4 integer in pairs of 2 separated by ,
Step 2: Using square root function, sum of (x1,x2) square and sum of (y1-y2) square. Step 3:
Print the distance

Program:

```
import math p1 = [4, 0] p2 = [6, 6] distance = math.sqrt( ((p1[0]-
p2[0])**2)+((p1[1]-p2[1])**2) ) print(distance)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A1\tempCodeRunnerFile.py"
6.324555320336759
```

Problem:

Function that takes a sequence of numbers and determines whether all are different from each other

Algorithm:

Step 1: Create function test_distinct Step 2:
Create a set of the data provide.
Step 3: Set data Structure doesn't take any duplicate numbers Step 4: If
the length of set and data in same print true.

Program:

```
data=input("set of intergers from 0-9: ") if len(data) ==
len(set(data)):
   print("True") else:
   print("False")
```

Input/Output:

```
PS C:\User> python -u "c:\Users\nikhi\Downloads\Python-1\A1\q15.py"
set of intergers from 0-9: 5
True
```

Problem:

Write a Python program to count the number of each character of a given text

Algorithm:

Step 1: Enter a string
Step 2: Iterate with n in string
Step 3: Using keys, calculate dict[n] not increase it if the key is prexting
Step 4: Else create a new key with value 1
Step 5: Dictionary library of python is used to keep track of character.

Program:

```
test_str = input("Enter a string :")
 all_freq = {}
 for i in test_str:     if i in
all_freq:         all_freq[i] += 1
else:
       all_freq[i] = 1


print ("Count of all characters  is :\n "
                                + str(all_freq))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A1\q16.py"
Enter a string :abababba23221
Count of all characters  is :
 {'a': 4, 'b': 4, '2': 3, '3': 1, '1': 1}
```

Problem:

Write a Python program that accept a positive number and subtract from this number the sum of its digits and so on. Continues this operation until the number is positive.

Algorithm:

Step 1: Change the number to string
Step 2: Iterate while number in positive
Step 3: Decrement n by its sum of digits
Step 4: Update the string number by list of string number

Program:

```
n=int(input("the number: ")) n_str =
str(n) while (n > 0):
    n -= sum([int(i) for i in list(n_str)])     n_str =
list(str(n))     print(n)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A1\q17.py"
the number: 25
18
9
0
```

Problem:

Write a Python program to find the digits which are absent in a given mobile number.

Algorithm:

Step 1: Input numbers in list
Step 2: Sort the set in range from start to end -1
Step 3: Here negative indexes are used
Step 4: Start in 1st[0], end in 1st[-1]

Program:

```
n=input("enter the phone number: ") all_nums =
set([0,1,2,3,4,5,6,7,8,9]) n = set([int(i) for i in n])
n = n.symmetric_difference(all_nums) n =
sorted(n) print(n)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A1\q18.py"
enter the phone number: 6202073290
[1, 4, 5, 8]
```

Problem:

Write a Python program to reverse the digits of a given number and add it to the original, If the sum is not a palindrome repeat this procedure

Algorithm:

Step 1: Enter the number
Step 2: Take a infinte loop of while
Step 3: Take k and assign seeing value of n in it
Step 4: Check if it's a palindrome , if yes break
Step 5: Else reverse the number and add it to a number and update the sum.

Step 6: Return the value of n

Program:

```
n=int(input("enter the number: "))  s = 0 #declare
the variable sum while True:
   k = str(n)  # converting the integer to string     if k == k[::-1]:
#reversing the number       break
   else:  #if not palindrome then again reverse the number       m = int(k[::-1])
# reverse statement       n += m

print(n) #after loop ends then
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A1\q19.py"
enter the number: 25
77
```

Problem:

Write a Python program to print the length of the series and the series from the given 3rd term, 3rd last term and the sum of a series.

Algorithm:

Step 1: Input third term,third last term and sum of series.
Step 2: Calculate the integral part of the formula
Step 3: Print total number of terms
Step 4: In order to calculate the common difference, use the formula used in arithemetic progression.
Step 5: Calculating the first term
Step 6: Iterating in range of n-1, print integral part of a
Step 7: Increament a by d after every iteration

Program:

```
tn = int(input("Input third term of the series: ")) tltn =
int(input("Input 3rd last term: ")) s_sum = int(input("Sum of the
series: ")) n = int(2*s_sum/(tn+tltn)) print("Length of the series:
",n)
 if n-
5==0:
  d = (s_sum-3*tn)//6

else
```

```
else:
    d = (tltn-tn)/(n-5)

a = tn-2*d
i = 0
print("Series:")
for  i in range(n-1):
    print(int(a),end=" ")
    a+=d
print(int(a),end=" ")
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A1\q20.py"
Input third term of the series: 51
Input 3rd last term: 20
Sum of the series: 452
Length of the series:  12
Series:
59 55 51 46 42 37 33 28 24 19 15 11
```

Result: Hence the Structured Programming has been successfully executed and compiled successfully.

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School of Computing

Aim: To implement Procedural Programming Paradigm

Problem:

Given a string, find its mirroring image

Algorithm:

Step 1: Input string from user
Step 2: Lookup dictionary for all valid mirrorable English character
Step 3: find string 2 in string 1
Step 4: If string 2 in rotation of string 1 return true
Step 5: else return false
Step 6: Exit

Program:

```
#1. Given a string, find its mirroring image def
mirror(a_882):    rev_882=a_882[::-1]    print(rev_882)
wd_882=input("Enter A Word:") mirror(wd_882)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\tempCodeRunnerFile.py"
Enter A Word:Nikhil
lihkiN
```

Problem:

Check if two strings are Rotationally Equivalent
Sample Input/Output
string 1 is : srmist
string 2 is : tsrmis
Are two strings Rotationally equal ? : True

Algorithm:

Step 1:Input 2 strings
Step 2: Concentrate

Step 3: If the string 2 is present is concentrate string, string 2 is rotation of string 1.
Step 4: return true
Step 5: else return false
Step 6: Exit

Program:

```
wd_882=input("Enter first word: ")
wd1_882=input("Enter second word:") res =
False for i in range(len(wd_882)):
      if wd_882[i: ] + wd_882[ :i] == wd1_882:
         res = True          break print("Are two strings Rotationally equal ? : "
+ str(res))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\tempCodeRunnerFile.py"
Enter first word: sam
Enter second word:nick
Are two strings Rotationally equal ? : False
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\tempCodeRunnerFile.py"
Enter first word: mom
Enter second word:mom
Are two strings Rotationally equal ? : True
```

Problem:

Given a number n, the task is to generate a random binary string of length n.

Algorithm:

Step 1: Input n
Step 2: Input string and key
Step 3: Randint function used to create random “0” or “1”
Step 4: Append the randomly generated “0” and “1” to string, key.
Step 5: return string,key Step 6:
Exit

Program:

```
import random n_882= int(input("Enter the length of binary string:"))
k_882= random.randint(1,5) for i in range(1,n_882+1):
if((k_882+i)%2 == 0):        print("0",end='')     else:
        print("1",end='')
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\q3.py"
Enter the length of binary string:6
010101
```

Problem:

Given a string, remove punctuation and any special characters

Algorithm:

Step 1: Input string from user
Step 2: Look up dictionary created for all valid punctuation
Step 3: Remove any invalid parameters as your move along the string
Step 4: Print the obtained string
Step 5: Exit

Program:

```
st_882=input("Enter a string: ") p_882='"!()[]-
{};:'"\,<>./?@#$%^&*_~'" for ele in st_882:     if ele
in p_882:
        st_882=st_882.replace(ele,"") print("String after
filtering:",st_882)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\q4.py"
Enter a string: nick@3442
String after filtering: nick3442
```

Problem:

Write a Python program to compute element-wise sum of given tuples.

Input
(11, 2, 3, 14)
(13, 5, 22, 10)
(12, 2, 3, 10)
Input/Output
(36, 9, 28, 34)

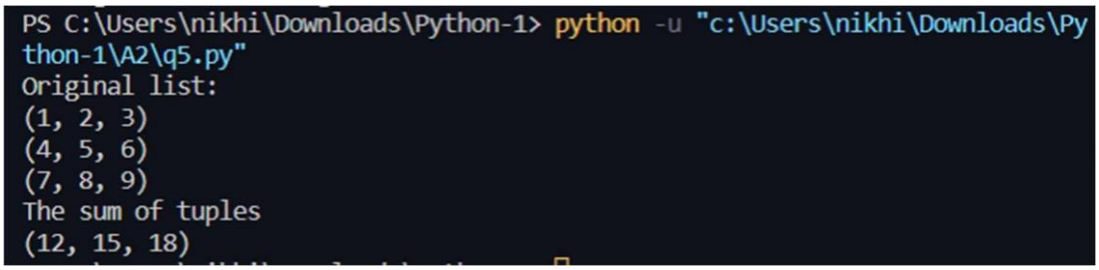
Algorithm:

Step 1: Input the tuple from user
Step 2: Store the sum in results
Step 3: result =tuple(mag(sum,zip(x,y,z))
Step 4: print the result
Step 5: Exit

Program:

```
a_882= (1,2,3) b_882 = (4,5,6) c_882= (7,8,9)
print("Original list:") print(a_882) print(b_882) print(c_882)
print("The sum of tuples","") print(tuple(map(sum,
zip(a_882,b_882,c_882))))
```

Input/Output:



Problem:

Write a Python program to remove an empty tuple(s) from a list of tuples.

Algorithm:

Step 1: Input the tuple from user
Step 2: filter method is used to remove empty one.
Step 3: tuples=filter(move,tuples)
Step 4: print tuples
Step 5: Exit

Program:

```
L_882= [(), (), ('',), ('a', 'b'), ('a', 'b', 'c'), ('d')] L_882 = [i for i in L_882 if i]
print(L_882)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\q6.py"
[('',), ('a', 'b'), ('a', 'b', 'c'), 'd']
```

Problem:

Write a Python program to count the elements in a list until an element is a tuple

Algorithm:

Step 1: Input the list from user
Step 2: Use instance() to verify whether we are encountering a tuple
Step 3: If instance (num,tuple) in true then break
Step 4: else counter ++
Step 5: print counter
Step 6: Exit

Program:

```
num_882 = [10,20,30,(10,20),40] c_882
= 0 for i in num_882:    if isinstance(i,
tuple):
    break    c_882+= 1 print("Number of element before
tuple: ",c_882)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\tempCodeRunnerFile.py"
Number of element before tuple:  3
```

Problem:

Write a Python program to Convert Tuple Matrix to Tuple List
Sample Input : [[(9, 51), (7, 9)], [(11, 1), (22, 19)]]
Input/Output : [(9, 7, 11, 22), (51, 9, 1, 19)]

Algorithm:

Step 1: Input a list from user
Step 2: We perform list comprehension and zip() is used to perform column pairing to render as tuple pairs.
Step 3: res=list(zip(*tup))
Step 4: print the list
Step 5: Exit

Program:

```
list_882= [[(9, 51), (7, 9)], [(11, 1), (22, 19)]]
 print("The original list is : " + str(list_882))
 temp_882= [ele for sub in list_882 for ele in sub]
 res = list(zip(*temp_882))
 print("The converted tuple list : " + str(res))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\tempCodeRunnerFile.py"
The original list is : [[(9, 51), (7, 9)], [(11, 1), (22, 19)]]
The converted tuple list : [(9, 7, 11, 22), (51, 9, 1, 19)]
```

Problem:

Write a Python program to count unique values in the list.

Algorithm:

Step 1: Input list from user
Step 2: Using counter function we will create a dictionary
Step 3: The keys of dictionary will be unique items and values will be the numbers of that key present in list
Step 4: Print unique number
Step 5: Exit

Program:

```
list_882=[1,3,3,2,4,4]
l_882=[] count_882=0 for i
in list_882:

    if i not in l_882:        count_882+=1
l_882.append(i)
print("No of unique items are: ",count_882)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\q9.py"
No of unique items are:  4
```

Problem:

Python Program to print all Possible Combinations from the three Digits

Algorithm:

Step 1: Input 3 digits
Step 2: Using internal permuatation U print all the combination
Step 3: This method takes a list as an input and returning an object list of tuples that contain all permuation in a list from
Step 4: print all the combination

Step 5: Exit

Program:

```
def comb_882(L):
        for i in range(3):
      for j in range(3):
         for k in range(3):              if (i!=j and j!=k and
i!=k):                print(L[i], L[j], L[k])
                  print("Possible combination :")
comb_882([1, 2, 3])
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\q10.py"
Possible combination :
1 2 3
1 3 2
2 1 3
2 3 1
3 1 2
3 2 1
```

Problem:

Write a Python program (using function) to print the even numbers from a given list.

Algorithm:

Step 1: Input list from user
Step 2: Iterate along the array
Step 3: Check divisible by 2
Step 4: Print the number
Step 5 : Exit

Program:

```
def even(a_882):    for i in a_882:       if(i
% 2 == 0):          print(i) print("Even
Numbers from list: ") l_882= [1,2,3,4,5,6]
even(l_882)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\q11.py"
Even Numbers from list:
2
4
6
```

Problem:

Write a Python function (using function) that checks whether a passed string is palindrome or not.

Algorithm:

Step 1: Take string from user
Step 2: Iterate string as argument
Step 3: If last letter is equal to first character recursively call the function with argument as the sliced list with the first character and last character removed. Step 4: Exit

Program:

```
def pal(wd_882):
    k_882= wd_882[::-1]     if(wd_882==
k_882):
        print("Palindrome Number")     else:
         print("Not a Palindrome") wd_882= input("Enter
a word :") pal(wd_882)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\q12.py"
Enter a word :madam
Palindrome Number
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\q12.py"
Enter a word :memory
Not a Palindrome
```

Problem:

Write a Python function (using function) that checks whether a given number is prime or not

Algorithm:

Step 1: Input the number from user
Step 2: Iterate from 2 to sqrt of (number)
Step 3: If we found any fact then we can print as not a prime number Step 4:
Initialize a flag that maintain states whether it is prime or not.

Program:

```
number_882= int(input("Enter any number: "))
 if number_882 > 1:     for i in range(2,
number_882):         if (number_882 % i) ==
0:
           print(number_882, "is not a prime number")            break
else:
       print(number_882, "is a prime number")
 else:
   print(number_882, "is not a prime number")
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\Python-1> python -u "c:\Users\nikhi\Downloads\Py
thon-1\A2\tempCodeRunnerFile.py"
Enter any number: 25
25 is not a prime number
```

Result: Hence the Procedural Programming has been successfully implemented and compiled successfully.

18CSC207J-Advanced Programming Practice
SRM Institute of Science & Engineering- Kattankulathur
Campus School of Computing

Aim: To implement Object Oriented Programming Paradigm

Problem:

Write a Python class named SRMIST with six attributes school, dept1, dept2, dept2 and dept3. Add a new attribute specialization and display the entire attribute and their values of the said class. Now remove the dept1 and dept2 attribute and display the entire attribute with values.

Algorithm:

Step 1: Create class 'SRMIST'
Step 2: school='SRMIST' ,dep1='Computer Science', dept2="Artificial Intelligence",dep3="Mech Engineering",dep4="Biotech"
Step 3: SRMIST. Specialization= 'Blockchain'
Step 4: Print attributes with value
Step 5: Exit

Program:

```
class SRMIST:
    school = 'SRMIST'     dept1 = 'Computer Science'
dept2 = 'Artificial Intelligence'     dept3 = 'Mechanical
Engineering'     dept4 = 'Biotech'
print("Original attributes and their values of the Student class:") for attr, value in
SRMIST.__dict__.items():
    if not attr.startswith('_'):        print(f'{attr} -> {value}')
print("\nAfter adding the specialization, attributes and their values with the said class:")
SRMIST.specialization     =  'Blockchain'  for  attr,  value  in
SRMIST.__dict__.items():
    if not attr.startswith('_'):        print(f'{attr} -> {value}')
print("\nAfter removing the dept1,dept2 attributes and their values from the said class:") del SRMIST.dept1 del
SRMIST.dept2
#delattr(Student, 'student_name') for attr, value in
SRMIST.__dict__.items():     if not attr.startswith('_'):
print(f'{attr} -> {value}')
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\python\lab
3\tempCodeRunnerFile.py"
Original attributes and their values of the Student class:
school -> SRMIST
dept1 -> Computer Science
dept2 -> Artificial Intelligence
dept3 -> Mechanical Engineering
dept4 -> Biotech

After adding the specialization, attributes and their values with the said class:
school -> SRMIST
dept1 -> Computer Science
dept2 -> Artificial Intelligence
dept3 -> Mechanical Engineering
dept4 -> Biotech
specialization -> Blockchain

After removing the dept1,dept2 attributes and their values from the said class:
school -> SRMIST
dept3 -> Mechanical Engineering
dept4 -> Biotech
specialization -> Blockchain
```

Problem:

Write a Python program to crate four empty classes, CTECH, CINTEL, NWC and DSBS. Now create some instances and check whether they are instances of the said classes or not. Also, check whether the said classes are subclasses of the built-in object class or not.

Algorithm:

Step 1: class Ctech ;pass
class Cintel; pass
class NWC; pass
class DSBS;pass
Step 2: student1=Ctech()
Marks1=Cintel()
Str=NWC()
Ma=DSBS()
Step 3: print(isinstance(marks1,CINTEL)
Step 4: print(isinstance(Ctech,object)
Step 5: Exit

Program:

```
class CTECH:
pass  class
CINTEL:
   pass  class
NWC:    pass
 class DSBS:
pass

student1 = CTECH()
marks1 = CINTEL()
stu=NWC() ma=DSBS()
 print(isinstance(student1, CTECH))
print(isinstance(marks1, CTECH))
print(isinstance(stu, CTECH))
print(isinstance(ma, CTECH))
 print(isinstance(marks1, CINTEL))
print(isinstance(student1, CINTEL))
print(isinstance(stu, CINTEL))
```

```
print(isinstance(ma, CINTEL))
 print("\nCheck whether the said classes are subclasses of the built-in object class or not.")
print(issubclass(CTECH, object)) print(issubclass(CINTEL, object)) print(issubclass(NWC, object))
print(issubclass(DSBS, object))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\python\lab
3\tempCodeRunnerFile.py"
True
False
False
False
True
False
False
False

Check whether the said classes are subclasses of the built-in object class or not.
True
True
True
True
```

Problem:

Write a program to print the names of the departments students by creating a Dept class. If no name is passed while creating an object of the Dept class, then the name should be "SCO", otherwise the name should be equal to the String value passed while creating the object of the Dept class.

Algorithm:

Step 1: def __init__(self,*args)
Step 2: if(len args)=1
Step 3: self.dept=args[0]
Step 4: elif(len(args))==0
Step 5: self.dept='SLO'
Step 6: print self.dept
Step 7: Exit

Program:

```
class Dept:     def __init__(self, *args):
if len(args) == 1:
self.dept=args[0]
        elif len(args) == 0:
self.dept="SCO"
        def deptname(self):
print(self.dept)
     d1=Dept()
d1.deptname()
 d2=Dept("CSE")
d2.deptname()
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\python\lab
3\q3.py"
SCO
CSE
```

Problem:

Create a class named 'Rectangle' with two data members- length and breadth and a function to calculate the area which is 'length*breadth'. The class has three constructors which are : having no parameter - values of both length and breadth are assigned zero.
having two numbers as parameters - the two numbers are assigned as length and breadth respectively. having one number as parameter - both length and breadth are assigned that number. Now, create objects of the 'Rectangle' class having none, one and two parameters and print their areas.

Algorithm:

Step 1: class Rectangle
Step 2: l=0,b=0
Step 3: def __init__(self,*args)
Step 4: if(len (args))==2
Selfl=args[0]
Selfb=args[1]
Step 5: else
Step 6: self.l=0
Self.b=0
Step 7: area=self.l*self.b

Program:

```
class rectangle:  length=0  breadth=0

    def __init__(self, *args):

            if len(args) == 2:

                    self.length=args[0];
            self.breadth=args[1]  elif len(args) ==
            1:  self.length=args[0]
```

```
                self.breadth=args[0]  else:

                self.length=0  self.breadth=0

    def area(self):  return self.length*self.breadth;

r1=rectangle(5,10) print(r1.area())
r2=rectangle(10) print(r2.area())
r3=rectangle() print(r3.area())
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\python\lab
3\q4.py"
50
100
0
```

Problem:

Create a class named 'PrintDT' to print various numbers of different datatypes by creating different functions with the same name 'python_data' having a parameter for each datatype. (example : tuple, list, string)

Algorithm:

Step 1: def pyd(self,list)
Step 2: print self.list
Step 3: def pyd(self,tuple)
Step 4: print(tuple)
Step 5: def pyd(self,str)
Step 6: print(str)
Step 7: p=PrintDT()
Step 8: Exit

Program:

```
class PrintDT:
      def py_data(self,list):  self.list=[]
            print(self.list)

      def py_data(self,tuple):
            self.tuple=()  print(tuple)

      def py_data(self,str):
            self.str="  print(str)

p=PrintDT()
p.py_data([1,2,3])
p.py_data(('a',[8,4,6],"mouse"))
p.py_data('amit')
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\python\lab
3\tempCodeRunnerFile.py"
[1, 2, 3]
('a', [8, 4, 6], 'mouse')
amit
```

Problem:

A student from SRMIST has his/her money deposited Rs.15000, Rs.30000 and Rs. 40,000 in banks-CUB, HDFC and Indian Bank respectively. We have to print the money deposited by him/her in a particular bank.
Create a class named 'Banks_SRMIST' with a function 'getBalance' which returns 0. Make its three subclasses named 'CUB', 'HDFC' and 'Indian_Bank' with a function with the same name 'getBalance' which returns the amount deposited in that particular bank. Call the function 'getBalance' by the object of each of the three banks.

Algorithm:

Step 1: class Bank_Srmist
Step 2: def getBalance()
Step 3: class WB(Banks_Srmist)
Step 4: def getBalance (balance)
Step 5: return balance
Step 6: class HDFC(Bank_Srmist)
Step 7: def getBalance(balance)
        Return balance
Step 8: print
Step 9: Exit

Program:

```
class Banks_SRMIST:     def
getBalance():
        return 0 class
CUB(Banks_SRMIST):
         def getBalance(balance):
         return balance class
HDFC(Banks_SRMIST):
         def getBalance(balance):
        return balance class
Indian_Bank(Banks_SRMIST):
         def getBalance(balance):
        return balance Banks_SRMIST()
print(CUB.getBalance(15000))
print(HDFC.getBalance(30000))
print(Indian_Bank.getBalance(40000))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\python\lab
3\tempCodeRunnerFile.py"
15000
30000
40000
```

Problem:

Create a Time class and initialize it with hours and minutes.
Make a method addTime which should take two time object and add them. E.g.- (2 hour and 50 min)+(1 hr and 20 min) is (4 hr and 10 min)
Make a method displayTime which should print the time.
Make a method DisplayMinute which should display the total minutes in the Time. E.g.- (1 hr 2 min) should display 62 minute.

Algorithm:

Step 1: create class Time
Step 2: def __init__(self,hours,min)
Step 3: self.hours=hours
Step 4: self.mins=mins
Step 5: def additive(t1,t2)
Step 6: t3.hours=t1.mins+t2.mins
Step 7: print
Step 8: Exit

Program:

```
class Time():
  def __init__(self, hours, mins):
   self.hours = hours    self.mins = mins
  def addTime(t1, t2):
   t3 = Time(0,0)    if
t1.mins+t2.mins > 60:
     t3.hours = (t1.mins+t2.mins)//60    t3.hours =
t3.hours+t1.hours+t2.hours    t3.mins = (t1.mins + t2.mins)
% 60    return t3
  def displayTime(self):
   print ("Time is",self.hours,"hours and",self.mins,"minutes.")
  def displayMinute(self):
   print ((self.hours*60)+self.mins)

a = Time(2,40) b =
Time(1,30) c =
Time.addTime(a,b)
c.displayTime()
c.displayMinute()
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\python\lab
3\tempCodeRunnerFile.py"
Time is 4 hours and 10 minutes.
250
```

Problem:

Write a program to print the area and perimeter of a triangle having sides of 3, 4 and 5 units by creating a class named 'Triangle' with a function to print the area and perimeter.

Algorithm:

Step 1: Create class Traingle
Step 2: def findPerimeter(self,s1,s2,s3)
Step 3: findArea(self,s1,s2,s3)
Step 4: p=s1+s2+s3
Step 5: s=p/2
Step 6: area=(0.5**(s*(s-s1)*(s-s2)*(s-s3))
Step 7: print Step
8: Exit Program:

```
class Triangle:
    def findPerimeter(self, s1, s2, s3):  return (s1 + s2 + s3)

    def findArea(self, s1, s2, s3):
        p = (s1 + s2 + s3)  s = p/2  return (s * (s-s1) * (s-
        s2)*(s-s3))**0.5

s1 = float(input("Enter the first side of the triangle : ")) s2 = float(input("Enter the
second side of the triangle : ")) s3 = float(input("Enter the third side of the triangle
: ")) u = Triangle()

print("The perimeter of the triangle is : {0:.2f}".format(
    u.findPerimeter(s1, s2, s3))) print("The area of the triangle is : {0:.2f}".format(u.findArea(s1, s2,
s3)))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\python\lab
3\tempCodeRunnerFile.py"
Enter the first side of the triangle : 20
Enter the second side of the triangle : 14
Enter the third side of the triangle : 12
The perimeter of the triangle is : 46.00
The area of the triangle is : 82.65
```

Result: Hence the Object Oriented Programming has been implemented and compiled successfully.

18CSC207J-Advanced Programming Practice
SRM Institute of Science & Engineering- Kattankulathur Campus

School of Computing

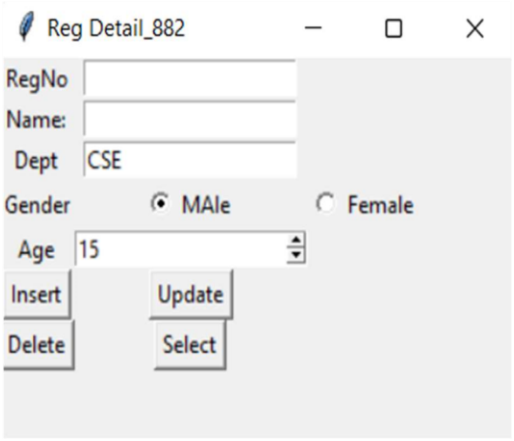
Aim: To implement Event Driven Programming Paradigm Algorithm:

Step 1: import tkinter package
Step 2: define functions that works on button actions
Step 3: Create multiple labels and Text fields according to the requirement Step 4: Call the defined functions in the command methods of button. Step 5: Call the mainloop
Step 6: Exit

```
import tkinter as tk from tkinter import * from tkinter import messagebox

def hello1():  msg = messagebox.show_882info( "Confirmation","Inserted Sucessfully")
def hello2():  msg = messagebox.show_882info( "Confirmation","Updated Sucessfully")
def hello3():  msg = messagebox.show_882info( "Confirmation","Deleted Sucessfully")
def hello4():  msg = messagebox.show_882info( "Confirmation","Select Button")
root_882=tk.Tk() root_882.title('Reg Detail_882') root_882.geometry('300x200')
l1_882=tk.Label(root_882,text="RegNo") l1_882.grid(row=0) t1_882=tk.Entry(root_882)
t1_882.grid(row=0,column=1) l2_882=tk.Label(root_882,text="Name:") l2_882.grid(row=1)
t2_882=tk.Entry(root_882) t2_882.grid(row=1,column=1) v = StringVar(root_882,
value='CSE') l3_882=tk.Label(root_882,text="Dept") l3_882.grid(row=2)
t3_882=tk.Entry(root_882,textvariable=v) t3_882.grid(row=2,column=1)
l4_882=tk.Label(root_882,text="Gender") l4_882.grid(row=3) radio1_882=IntVar()
```

```
radio2_882=IntVar()
rb1_882=Radiobutton(root_882,text='MAle',variable=radio1_882,value=0)
rb1_882.grid(row=3,column=1)
rb2_882=Radiobutton(root_882,text='Female',variable=radio1_882,value=1)
rb2_882.grid(row=3,column=2)
l5_882=tk.Label(root_882,text="Age")
l5_882.grid(row=4)
spin_882 = Spinbox(root_882,from_=15,to=20)
spin_882.grid(row=4,column=1)
b1_882=tk.Button(root_882, text='Insert',command=hello1)
b1_882.grid(row=5,column=0)
b2_882=tk.Button(root_882, text='Update',command=hello2)
b2_882.grid(row=5,column=1)
b3_882=tk.Button(root_882, text='Delete',command=hello3)
b3_882.grid(row=6,column=0)
b4_882=tk.Button(root_882, text='Select',command=hello4)
b4_882.grid(row=6,column=1)
root_882.mainloop()
```

Input/Output:



Algorithm:

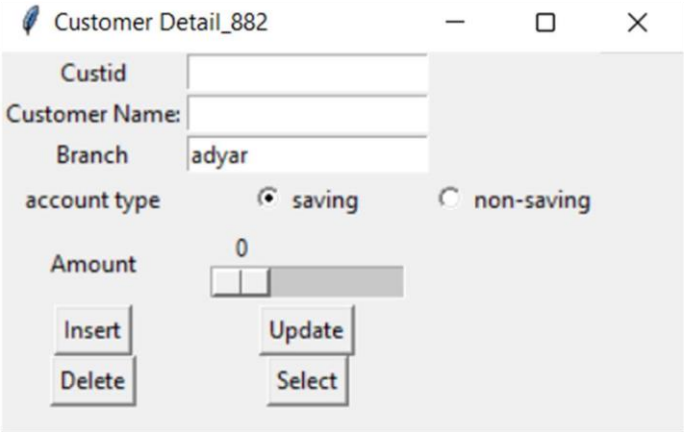
Step 1: import tkinter package
Step 2: define functions that works on button actions
Step 3: Create multiple labels and Text fields according to the requirement
Step 4: Call the defined functions in the command methods of button.
Step 5: Call the mainloop
Step 6: Exit

Program:

```
import tkinter as tk
from tkinter import *
```

```
from tkinter import messagebox

def hello1():  msg = messagebox.show_882info( "Confirmation","Inserted Sucessfully")
def hello2():  msg = messagebox.show_882info( "Confirmation","Updated Sucessfully")
def hello3():  msg = messagebox.show_882info( "Confirmation","Deleted Sucessfully")
def hello4():  msg = messagebox.show_882info( "Confirmation","Select Button")
root_882=tk.Tk() root_882.title('tk') root_882.geometry('300x200')
l1_882=tk.Label(root_882,text="Custid") l1_882.grid(row=0)
t1_882=tk.Entry(root_882) t1_882.grid(row=0,column=1)
l2_882=tk.Label(root_882,text="Customer Name:") l2_882.grid(row=1)
t2_882=tk.Entry(root_882) t2_882.grid(row=1,column=1)









v = StringVar(root_882, value='adyar') l3_882=tk.Label(root_882,text="Branch")
l3_882.grid(row=2) t3_882=tk.Entry(root_882,textvariable=v) t3_882.grid(row=2,column=1)
l4_882=tk.Label(root_882,text="account type") l4_882.grid(row=3) radio1_882=IntVar()
radio2_882=IntVar() rb1_882=Radiobutton(root_882,text='saving',variable=radio1_882,value=0)
rb1_882.grid(row=3,column=1) rb2_882=Radiobutton(root_882,text='non-
saving',variable=radio1_882,value=1) rb2_882.grid(row=3,column=2)
l5_882=tk.Label(root_882,text="Amount") l5_882.grid(row=4) w_882 = Scale(root_882, from_=0,
to=200, orient=HORIZONTAL) w_882.grid(row=4,column=1) b1_882=tk.Button(root_882,
text='Insert',command=hello1) b1_882.grid(row=5,column=0) b2_882=tk.Button(root_882,
text='Update',command=hello2) b2_882.grid(row=5,column=1) b3_882=tk.Button(root_882,
text='Delete',command=hello3) b3_882.grid(row=6,column=0) b4_882=tk.Button(root_882,
text='Select',command=hello4) b4_882.grid(row=6,column=1) root_882.mainloop()
```

Input/Output:



Algorithm:

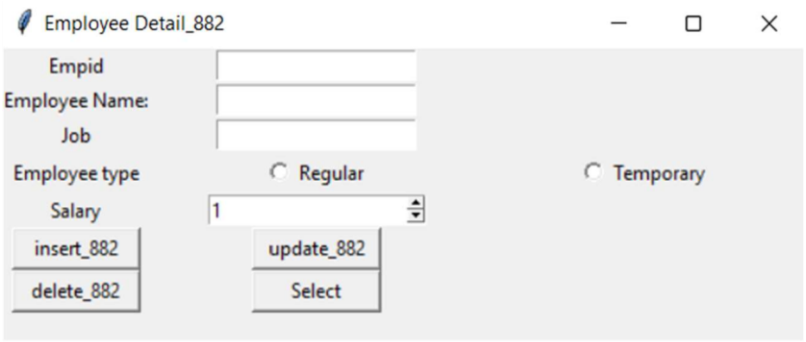
Step 1: import tkinter package
Step 2: define functions that works on button actions
Step 3: Create multiple labels and Text fields according to the requirement
Step 4: Call the defined functions in the command methods of button.
Step 5: Call the mainloop
Step 6: Exit

Program:

```
import tkinter as tk
from tkinter import *

root_882=tk.Tk()
root_882.title('Employee Detail_882')
l1_882=tk.Label(root_882,text="Empid")
l1_882.grid(row=0)
t1=tk.Entry(root_882)
t1.grid(row=0,column=1)
l2=tk.Label(root_882,text="Employee Name:")
l2.grid(row=1)
t2_882=tk.Entry(root_882)
t2_882.grid(row=1,column=1)
l3_882=tk.Label(root_882,text="Job")
l3_882.grid(row=2)
t3_882=tk.Entry(root_882)
t3_882.grid(row=2,column=1)
emty=IntVar()
def emtype():
    print(emty.get())
g=tk.Label(root_882,text="Employee type")
g.grid(row=3,column=0)
```

```
g1=Radiobutton(root_882,text="Regular",variable=emty,width=25,value=1,command=emtype)
g1.grid(row=3,column=1)
g2=Radiobutton(root_882,text="Temporary",variable=emty,width=25,value=2,command=emtype)
g2.grid(row=3,column=2)
age=tk.Label(root_882,text="Salary")
age.grid(row=4,column=0)
age=Spinbox(root_882,from_=1, to = 30)
age.grid(row=4,column=1)
insert_882=tk.Button(root_882,text="insert_882",width=10,command=root_882.destroy)
insert_882.grid(row=5,column=0)
update_882=tk.Button(root_882,text="update_882",width=10,command=root_882.destroy)
update_882.grid(row=5,column=1)
delete_882=tk.Button(root_882,text="delete_882",width=10,command=root_882.destroy)
delete_882.grid(row=6,column=0)
select=tk.Button(root_882,text="Select",width=10,command=root_882.destroy)
select.grid(row=6,column=1)

root_882.mainloop()
```

Input/Output:



Algorithm:

Step 1: import tkinter package
Step 2: define functions that works on button actions
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Step 5: Call the mainloop
Step 6: Exit

Program:

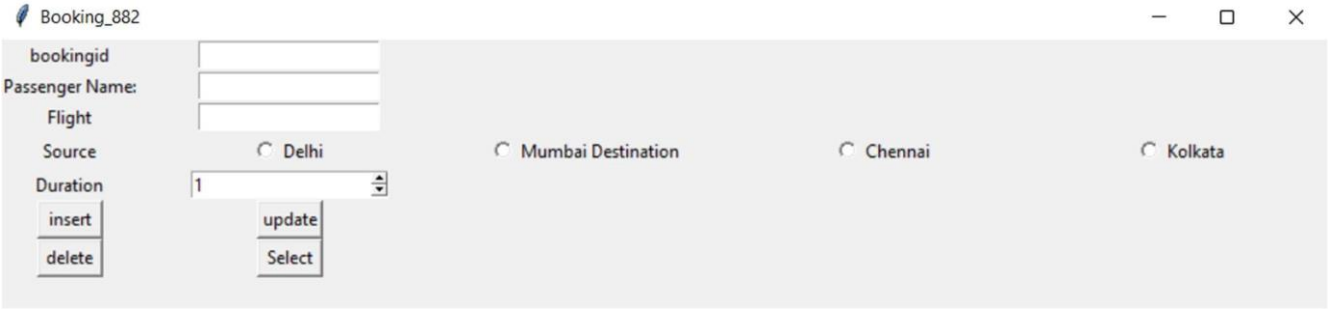
```
import tkinter as tk
from tkinter import *

root_882=tk.Tk()
root_882.title('Booking_882')
l1_882=tk.Label(root_882,text="bookingid")
```

```
l1_882.grid(row=0) t1_882=tk.Entry(root_882)
t1_882.grid(row=0,column=1)
l2_882=tk.Label(root_882,text="Passenger Name:")
l2_882.grid(row=1) t2_882=tk.Entry(root_882)
t2_882.grid(row=1,column=1)
l3_882=tk.Label(root_882,text="Flight") l3_882.grid(row=2)
t3_882=tk.Entry(root_882) t3_882.grid(row=2,column=1)
fli=IntVar() def flidis():
    print(fli.get()) g=tk.Label(root_882,text="Source")
g.grid(row=3,column=0) g1=Radiobutton(root_882,text="Delhi",variable=fli,width=25,value=1,command=flidis)
g1.grid(row=3,column=1)
g2=Radiobutton(root_882,text="Mumbai
Destination",variable=fli,width=25,value=2,command=flidis) g2.grid(row=3,column=2)
g2=Radiobutton(root_882,text="Chennai",variable=fli,width=25,value=3,command=flidis)
g2.grid(row=3,column=3)
g2=Radiobutton(root_882,text="Kolkata",variable=fli,width=25,value=4,command=flidis)
g2.grid(row=3,column=4) age=tk.Label(root_882,text="Duration") age.grid(row=4,column=0)
age=Spinbox(root_882,from_=1, to = 30) age.grid(row=4,column=1)
insert_882=tk.Button(root_882,text="insert",width=5,command=root_882.destroy)
insert_882.grid(row=5,column=0)
update_882=tk.Button(root_882,text="update",width=5,command=root_882.destroy)
update_882.grid(row=5,column=1)
delete_882=tk.Button(root_882,text="delete",width=5,command=root_882.destroy)
delete_882.grid(row=6,column=0)
select=tk.Button(root_882,text="Select",width=5,command=root_882.destroy) select.grid(row=6,column=1)

root_882.mainloop()
```

Input/Output:



Algorithm:

Step 1: import tkinter package
Step 2: define functions that works on button actions
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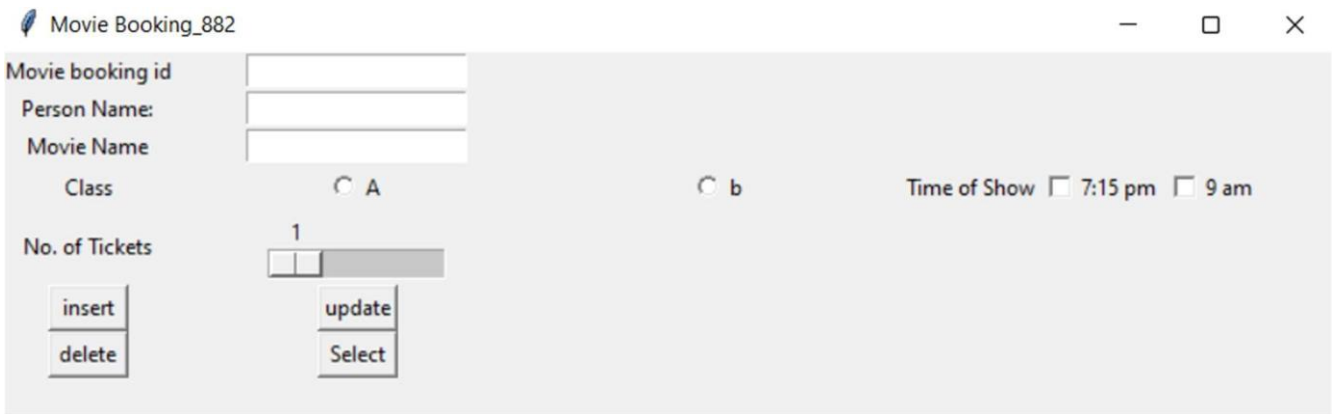
Call the defined functions in the command methods of button.
Step 5: Call the mainloop
Step 6: Exit

Program:

```
import tkinter as tk from tkinter
import *
 root_882=tk.Tk() root_882.geometry("750x250")
root_882.title('Movie Booking_882')
l1_882=tk.Label(root_882,text="Movie booking id")
l1_882.grid(row=0) t1_882=tk.Entry(root_882)
t1_882.grid(row=0,column=1)
l2_882=tk.Label(root_882,text="Person Name:")
l2_882.grid(row=1) t2_882=tk.Entry(root_882)
t2_882.grid(row=1,column=1)
l3_882=tk.Label(root_882,text="Movie Name")
l3_882.grid(row=2) t3_882=tk.Entry(root_882)
t3_882.grid(row=2,column=1) boo=IntVar() def tick():
    print(boo.get()) g=tk.Label(root_882,text="Class")
g.grid(row=3,column=0) g1=Radiobutton(root_882,text="A",variable=boo,width=25,value=1,command=tick)
g1.grid(row=3,column=1) g2=Radiobutton(root_882,text="b",variable=boo,width=25,value=2,command=tick)
```

```
g2.grid(row=3,column=2) g=tk.Label(root_882,text="Time of Show")
g.grid(row=3,column=3)
g1=Checkbutton(root_882, text='7:15 pm') g1.grid(row=3,column=4)
g2=Checkbutton(root_882, text='9 am') g2.grid(row=3,column=5)
age=tk.Label(root_882,text="No. of Tickets")
age.grid(row=4,column=0) age=Scale(root_882, from_=1, to= 20,
orient=HORIZONTAL) age.grid(row=4,column=1)
insert_882=tk.Button(root_882,text="insert",width=5,command=root_882.destroy)
insert_882.grid(row=5,column=0)
update_882=tk.Button(root_882,text="update",width=5,command=root_882.destroy)
update_882.grid(row=5,column=1)
delete_882=tk.Button(root_882,text="delete",width=5,command=root_882.destroy)
delete_882.grid(row=6,column=0) select=tk.Button(root_882,text="Select",width=5,command=root_882.destroy)
select.grid(row=6,column=1)
 root_882.mainloop()
```

Input/Output:



Algorithm:

Step 1: import tkinter package
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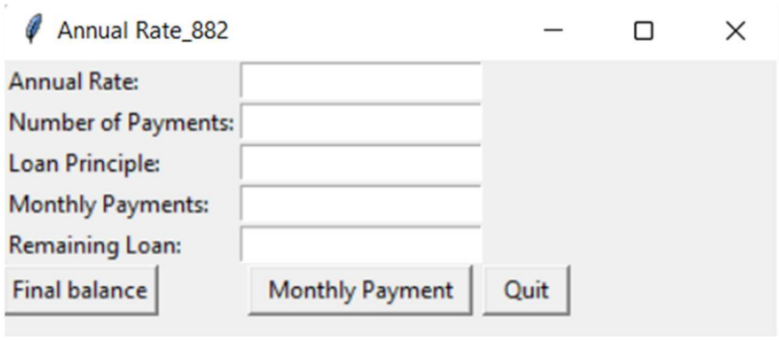
Step 6: Exit

Program:

```
import tkinter as tk from tkinter
import *
 root_882=tk.Tk() root_882.geometry("400x200")
root_882.title('Annual Rate_882')
l1_882=tk.Label(root_882,text="Annual Rate:")
l1_882.grid(row=0,sticky='w') t1_882=tk.Entry(root_882)
t1_882.grid(row=0,column=1,sticky='w')
l2_882=tk.Label(root_882,text="Number of Payments:")
l2_882.grid(row=1,sticky='w') t2_882=tk.Entry(root_882)
t2_882.grid(row=1,column=1,sticky='w')
l3_882=tk.Label(root_882,text="Loan Principle:")
l3_882.grid(row=2,sticky='w')
```

```
t3_882=tk.Entry(root_882)
t3_882.grid(row=2,column=1,sticky='w')
l2_882=tk.Label(root_882,text="Monthly Payments:")
l2_882.grid(row=3,sticky='w') t2_882=tk.Entry(root_882)
t2_882.grid(row=3,column=1,sticky='w') l2_882=tk.Label(root_882,text="Remaining Loan:")
l2_882.grid(row=4,sticky='w') t2_882=tk.Entry(root_882) t2_882.grid(row=4,column=1,sticky='w')
final=tk.Button(root_882,text="Final balance",width=10,command=root_882.destroy)
final.grid(row=5,column=0,sticky='w') monthly=tk.Button(root_882,text="Monthly
Payment",width=15,command=root_882.destroy) monthly.grid(row=5,column=1)
qui=tk.Button(root_882,text="Quit",width=5,command=root_882.destroy)
qui.grid(row=5,column=2,sticky=tk.N) root_882.mainloop()
```

Input/Output:



Algorithm:

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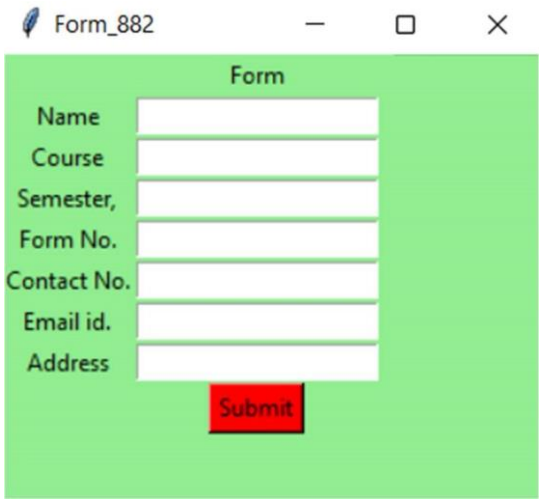
Step 6: Exit

Program:

```
from tkinter import *

master = Tk()
myText=StringVar()
master.title('Form_882')
Label(master, text="Form",bg='light green').grid(row=0,column=1)
Label(master, text="Name",bg='light green').grid(row=1)
Label(master, text="Course",bg='light green').grid(row=2)
Label(master, text="Semester,",bg='light green').grid(row=3)
Label(master, text="Form No.",bg='light green').grid(row=4)
Label(master, text="Contact No.",bg='light green').grid(row=5)
Label(master, text="Email id.",bg='light green').grid(row=6)
Label(master, text="Address",bg='light green').grid(row=7)
master.configure(bg='light green')

e1_882 = Entry(master)
e2_882 = Entry(master)
e3_882 = Entry(master)
e4_882 = Entry(master)
e5_882 = Entry(master)
e6_882 = Entry(master)
e7_882 = Entry(master)

e1_882.grid(row=1, column=1)
e2_882.grid(row=2, column=1)
```

```
e3 882.grid(row=3, column=1)
e4 882.grid(row=4, column=1)
e5 882.grid(row=5, column=1)
e6 882.grid(row=6, column=1)
e7 882.grid(row=7, column=1)
b = Button(master, text="Submit",bg='RED')
b.grid(row=8,column=1)
mainloop()
```

Input/Output:



Algorithm:

Step 1: import tkinter package
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Program:

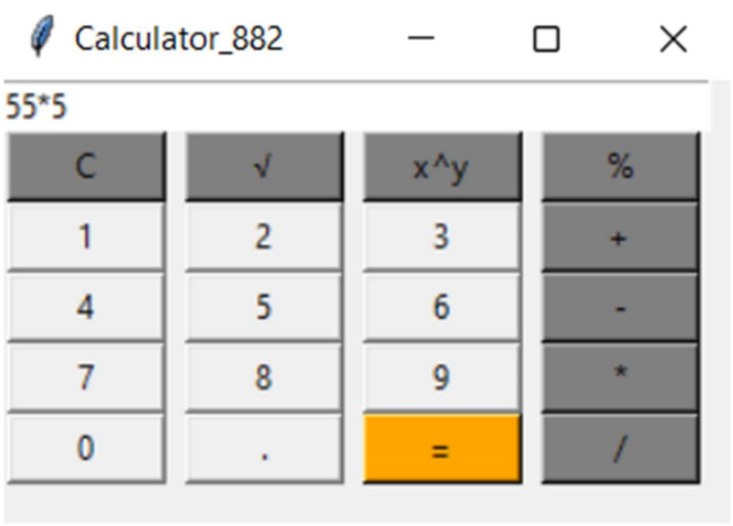
```
from tkinter import *

expression = ""


def press(num):
    global expression
    expression = expression + str(num)
    equation.set(expression)
```

```
def equalpress():     try:
        global expression         total =
str(eval(expression))         equation.set(total)
expression = ""     except:
        equation.set(" error ")         expression = ""


def clear():
    global expression     expression = ""
equation.set("0")


if __name__ == "__main__":
    gui = Tk()
    gui.title("Calculator_882")     gui.geometry("270x150")     equation =
StringVar()     expression_field = Entry(gui, textvariable=equation)
expression_field.grid(columnspan=4, ipadx=70)     clrscr = Button(gui, text='
C ', fg='black', bg='grey',                     command=clear, height=1, width=7)
clrscr.grid(row=2, column=0)
     squareRoot = Button(gui, text=' √ ', fg='black', bg='grey',
command=lambda: press('√'), height=1, width=7)     squareRoot.grid(row=2, column=1)
     exponent = Button(gui, text=' x^y ', fg='black', bg='grey',
command=lambda: press('^'), height=1, width=7)     exponent.grid(row=2, column=2)
     percent = Button(gui, text=' % ', fg='black', bg='grey',
command=lambda: press('%'), height=1, width=7)

    percent.grid(row=2, column=3)
     num1 = Button(gui, text=' 1 ', fg='black',
                command=lambda: press(1), height=1, width=7)     num1.grid(row=3, column=0)
     num2 = Button(gui, text=' 2 ', fg='black',                     command=lambda:
press(2), height=1, width=7)     num2.grid(row=3, column=1)
```

```
num3 = Button(gui, text=' 3 ', fg='black', command=lambda: press(3),
      height=1, width=7)
num3.grid(row=3, column=2)

plus = Button(gui, text=' + ', fg='black', bg='grey',  command=lambda: press('+'), height=1,
                          width=7)
plus.grid(row=3, column=3)

num4 = Button(gui, text=' 4 ', fg='black',  command=lambda: press(4),
                          height=1, width=7)
num4.grid(row=4, column=0)

num5 = Button(gui, text=' 5 ', fg='black',  command=lambda: press(5),
                          height=1, width=7)
num5.grid(row=4, column=1)

num6 = Button(gui, text=' 6 ', fg='black',  command=lambda: press(6),
                          height=1, width=7)
num6.grid(row=4, column=2)

minus = Button(gui, text=' - ', fg='black', bg='grey',  command=lambda: press("-"), height=1,
                           width=7)
minus.grid(row=4, column=3)

num7 = Button(gui, text=' 7 ', fg='black',  command=lambda: press(7),
                          height=1, width=7)
num7.grid(row=5, column=0)

num8 = Button(gui, text=' 8 ', fg='black',  command=lambda: press(8),
                          height=1, width=7)
num8.grid(row=5, column=1)

num9 = Button(gui, text=' 9 ', fg='black',  command=lambda: press(9),
                          height=1, width=7)
num9.grid(row=5, column=2)

multiply = Button(gui, text=' * ', fg='black', bg='grey',  command=lambda: press('*'), height=1,
                                width=7)
multiply.grid(row=5, column=3)

num0 = Button(gui, text=' 0 ', fg='black',  command=lambda: press(0),
                          height=1, width=7)
num0.grid(row=6, column=0)

decimal = Button(gui, text=' . ', fg='black',  command=lambda: press('.'), height=1,
                              width=7)
decimal.grid(row=6, column=1)
```

```
    equals = Button(gui, text=' = ', fg='black', bg='orange',
                    command=equalpress, height=1, width=7)
  equals.grid(row=6, column=2)

    divide = Button(gui, text=' / ', fg='black', bg='grey',
                    command=lambda: press('/'), height=1, width=7)
    divide.grid(row=6, column=3)

    # start the GUI
    gui.mainloop()
```

Input/Output:



Algorithm:

Step 1: import tkinter package
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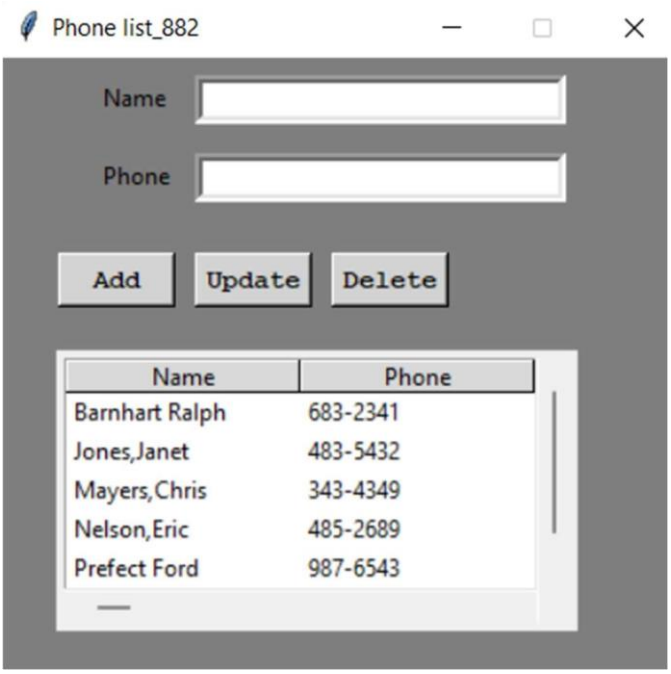
Step 6: Exit

Program:

```
from tkinter import *
from tkinter import ttk
root = Tk()
root.title("Phone list_882")
root.geometry("350x320")
root.resizable(0, 0)
root.configure(background="#7F7F7F")
```

```
name = Label(root, text="Name",background="#7F7F7F").place(x=51, y=10) nameEntry =
Entry(root, width=30,bd=4).place(x=101, y=9) phone = Label(root, text="Phone",
background="#7F7F7F").place(x=51, y=50) phoneEntry = Entry(root,
width=30,bd=4).place(x=101, y=49)
add = Button(root, text="Add", bg="light grey",padx=13,font=("Courier New",10,'bold')).place(x=31, y=100)
update = Button(root, text="Update",bg="light grey",font=("Courier New",10,'bold')).place(x=101, y=100)
delete = Button(root, text="Delete", bg="light grey",font=("Courier
New",10,'bold')).place(x=171, y=100) f1=Frame(root,bd=4) f1.pack() sb=Scrollbar(f1)
sb.pack(side=RIGHT,fill=Y) sb2= Scrollbar(f1, orient="horizontal")
sb2.pack(side=BOTTOM, fill=X) f1.place(x=30, y=150) tree =
ttk.Treeview(f1,height=5,columns=(1,2),show='headings')
sb.configure(command=tree.yview) tree.configure(yscrollcommand=sb.set)
tree.column(1,width=120) tree.column(2,width=120) tree.heading(1, text="Name")
tree.heading(2, text="Phone") tree.insert(parent="", index=0, values=("Barnhart Ralph",
"683-2341")) tree.insert(parent="", index=1, values=("Jones,Janet", "483-5432"))
tree.insert(parent="", index=2, values=("Mayers,Chris", "343-4349")) tree.insert(parent="",
index=3, values=("Nelson,Eric", "485-2689")) tree.insert(parent="", index=4,
values=("Prefect Ford", "987-6543")) tree.insert(parent="", index=5, values=("Smith,Bob",
"689-1234")) tree.insert(parent="", index=6, values=("Smith,Robert", "689-1234"))
tree.pack(side=LEFT) s = ttk.Style()
s.theme_use("default")
s.map("Treeview") root.mainloop()
```

Input/Output:



Algorithm:

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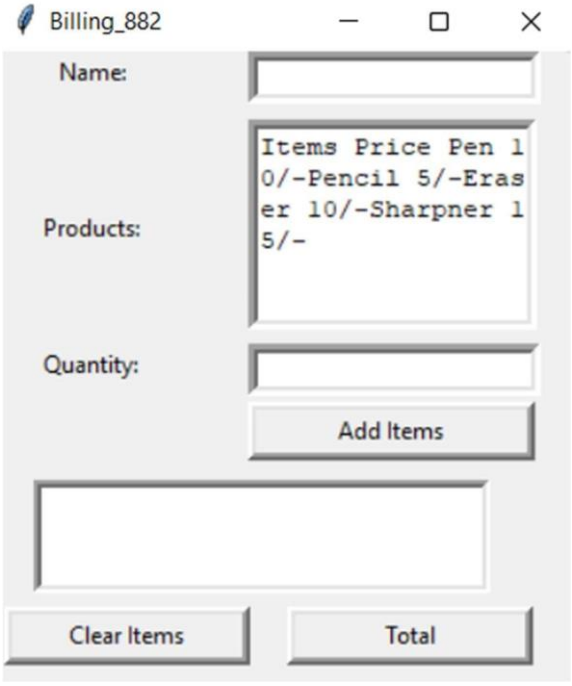
Program:

```
from tkinter import *
r=Tk()
r.title("Billing 882")
r.geometry("285x325")
label1=Label(r,text="Name:")
label1.place(x=30,y=0)
entry1=Entry(r,bd=5,width=23)
entry1.place(x=130,y=0)
text1=Text(r,height=6,width=17,bd=5)
text1.place(x=130,y=35)
s1 = """Items Price"""
s2 = """ """
s3 = """Pen 10/-"""
s4 = """Pencil 5/-"""
s5 = """Eraser 10/-"""
s6 = """Sharpner 15/-"""
```

```
text1.insert(END,s1) text1.insert(END,s2)
text1.insert(END,s3) text1.insert(END,s4)
text1.insert(END,s5) text1.insert(END,s6)
entry2=Entry(r,bd=5,width=23)
entry2.place(x=130,y=150)
label2=Label(r,text="Products:")
label2.place(x=22,y=80)
label3=Label(r,text="Quantity:")
label3.place(x=22,y=150)
button1=Button(r,text="Add Items",width=19,bd=4)
button1.place(x=130,y=180) text2=Text(r,height=3,width=28,bd=4)
text2.place(x=20,y=220) button2=Button(r,text="Clear
Items",bd=4,width=16) button2.place(x=5,y=285)
button3=Button(r,text="Total",bd=4,width=16)
button3.place(x=150,y=285)
r.mainloop()
```

Input/Output:



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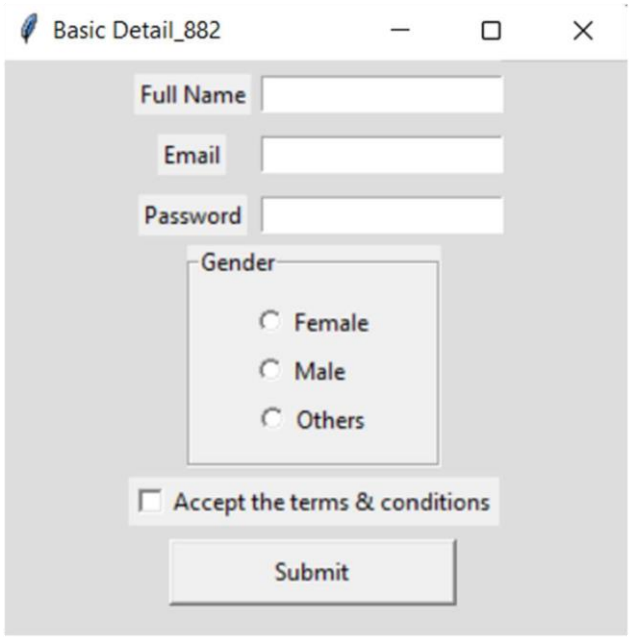
Program:

```
from tkinter import * ws_882 =Tk() ws_882.title('Basic Detail_882')
ws_882.geometry('250x300') ws_882.configure(bg='#dddddd') frame1_882 =
Label(ws_882, bg='#dddddd') frame1_882.pack() frame2_882 = LabelFrame(frame1_882,
text='Gender', padx=30, pady=10) var =IntVar() cb = IntVar()
Label(frame1_882, text='Full Name').grid(row=0, column=0, padx=5, pady=5)
Label(frame1_882, text='Email').grid(row=1, column=0, padx=5, pady=5)
Label(frame1_882, text='Password').grid(row=2, column=0, padx=5, pady=5)
Radiobutton(frame2_882, text='Female', variable=var, value=1).pack()
Radiobutton(frame2_882, text='Male', variable=var, value=2).pack(anchor=W)
Radiobutton(frame2_882, text='Others', variable=var, value=3).pack() name_Tf =
Entry(frame1_882) name_Tf.grid(row=0, column=2)
Entry(frame1_882).grid(row=1, column=2)
Entry(frame1_882, show="*").grid(row=2, column=2) frame2_882.grid(row=3,
columnspan=3,padx=30)
Checkbutton(frame1_882, text='Accept the terms & conditions', variable=cb, onvalue=1,
offvalue=0).grid(row=4, columnspan=4, pady=5) submit_btn = Button(frame1_882, text="Submit", padx=50,
pady=5) submit_btn.grid(row=5, columnspan=4, pady=2) ws_882.mainloop()
```

Input/Output:



Algorithm:

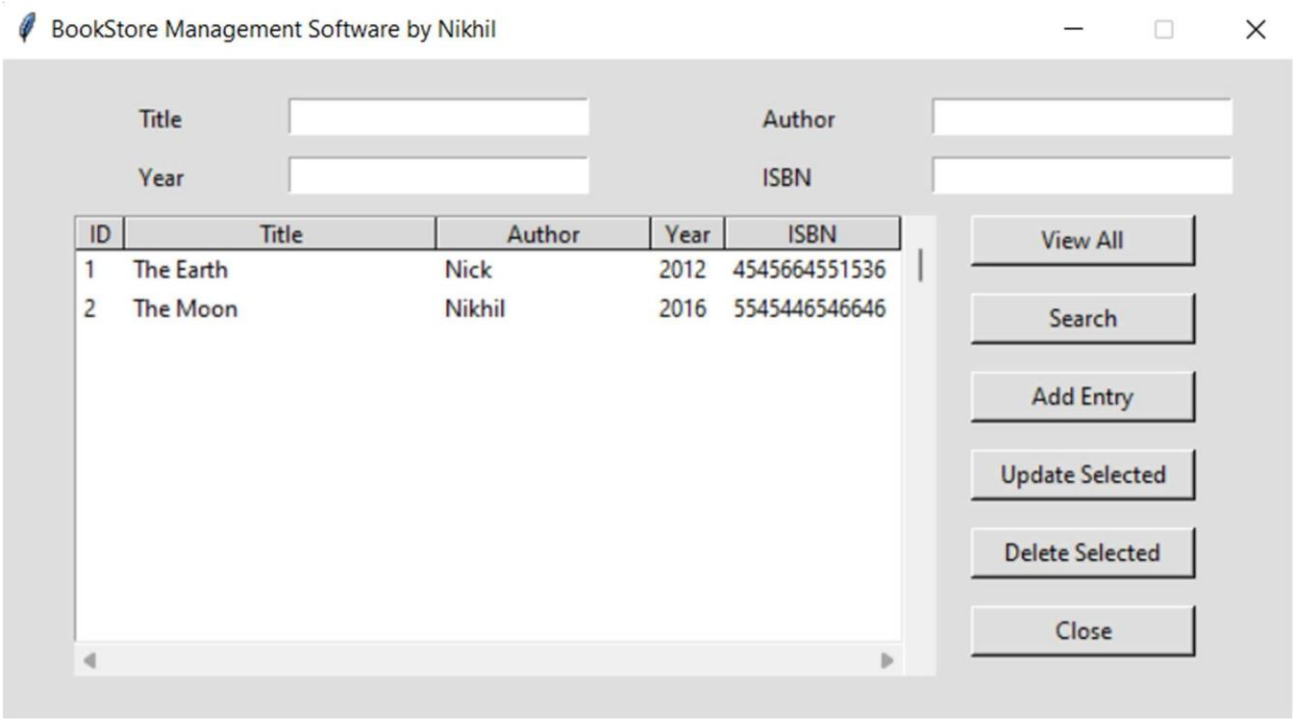
Step 1: import tkinter package
Step 2: define functions that works on button actions
Step 3: Create multiple labels and Text fields according to the requirement
Step 4: Call the defined functions in the command methods of button.
Step 5: Call the mainloop
Step 6: Exit

Program:

```
from tkinter import *
from tkinter import ttk
from tkinter import font
root = Tk()
root.geometry("670x340")
root.title("BookStore Management Software by Nikhil")
root.resizable(0, 0)
root.configure(bg="#DFDFDE")
f = "Helvetica 13 bold"
title = Label(root, text="Title",bg="#DFDFDE").place(x=70, y=20)
titleEntry = Entry(root,width=25).place(x=150, y=20)
year = Label(root, text="Year",bg="#DFDFDE").place(x=70, y=50)
yearEntry = Entry(root,width=25).place(x=150, y=50)
author = Label(root, text="Author",bg="#DFDFDE").place(x=390, y=20)
authorEntry = Entry(root,width=25).place(x=480, y=20)
isbn = Label(root, text="ISBN",bg="#DFDFDE").place(x=390, y=50)
isbnEntry = Entry(root,width=25).place(x=480, y=50)
viewAll = Button(root, text="View All", width=15,bg="#DFDFDE").place(x=500, y=80)
```

```
search = Button(root, text="Search", width=15,bg="#DFDFDE").place(x=500, y=120) addEntry = Button(root,
text="Add Entry", width=15,bg="#DFDFDE").place(x=500, y=160) updateSelected = Button(root, text="Update
Selected", width=15,bg="#DFDFDE").place(x=500, y=200) deleteSelected = Button(root, text="Delete Selected",
width=15,bg="#DFDFDE").place(x=500, y=240) close = Button(root, text="Close",
width=15,bg="#DFDFDE").place(x=500, y=280) data_frame = Frame(root) data_frame.pack() # scrollbar data_scroll
= Scrollbar(data_frame) data_scroll.pack(side=RIGHT, fill=Y) data_scroll = Scrollbar(data_frame,
orient="horizontal") data_scroll.pack(side=BOTTOM, fill=X) frame = ttk.Treeview( data_frame,
yscrollcommand=data_scroll.set, xscrollcommand=data_scroll.set
)
style = ttk.Style() style.configure("Treeview.Heading", font="Ariel 10
bold") frame.pack() data_frame.place(x=40, y=80)
data_scroll.config(command=frame.yview)
data_scroll.config(command=frame.xview)
# define our column
frame["columns"] = ("ID", "Title", "Author", "Year", "ISBN")
frame.column("#0", width=0, stretch=NO) frame.column("ID", width=25)
frame.column("Title", width=160) frame.column("Author", width=110)
frame.column("Year", width=38) frame.column("ISBN", width=90)
frame.heading("#0", text="") frame.heading("ID", text="ID")
frame.heading("Title", text="Title") frame.heading("Author", text="Author")
frame.heading("Year", text="Year") frame.heading("ISBN", text="ISBN")
frame.insert(
parent="", index=0, values=("1", "The Earth", "Nick", "2012", "4545664551536")
)
frame.insert( parent="", index=1, values=("2", "The Moon", "Nikhil", "2016", "5545446546646")
)
s = ttk.Style()
s.theme_use("default")
s.map("Treeview") root.mainloop()
```

Input/Output:



Algorithm:

Step 1: import tkinter package
Step 2: define functions that works on button actions
Step 3: Create multiple labels and Text fields according to the requirement
Step 4: Call the defined functions in the command methods of button.
Step 5: Call the mainloop
Step 6: Exit

Program:

```
import tkinter as tk
from tkinter import ttk
r_882= tk.Tk()
r_882.title('Time Converter_882')
r_882.geometry("380x210")
label1_882=tk.Label(r_882,fg="#fff",text="Welcome to Real Time Currency
Converter",bg="#187498",font='Helvetica 12 bold',justify='center',width=38)
label1_882.place(x=0,y=0)
label2_882=tk.Label(r_882,text="1 USD = 78.93 Indian Rupee",font='Helvetica 12
bold',justify='center')
label2_882.place(x=81,y=40)
label3_882=tk.Label(r_882,text="Date : 2022-06-15",font='Helvetica 12
bold',justify='center')
label3_882.place(x=120,y=65)
n_882= tk.StringVar()
```

```
c1_882= ttk.Combobox(r_882, width = 13,justify='center', textvariable = n_882)
c1_882['values'] = (' USD ')
c1_882.place(x = 40, y = 120)
c1_882.current(0)
n2_882= tk.StringVar()
c2_882= ttk.Combobox(r_882, width = 13,justify='center', textvariable = n2_882)
c2_882['values'] = (' INR')
c2_882.place(x = 230, y = 120)
c2_882.current(0)
e1_882=tk.Entry(r_882,justify='center',width=13)
e1_882.place(x=50,y=150)
e2_882=tk.Entry(r_882,justify='center',width=13)
e2_882.place(x=240,y=150)
b1_882=tk.Button(r_882,text="Convert",bg='blue',fg="#fff")
b1_882.place(x=160,y=165)
r_882.mainloop()
```

Input/Output:

Algorithm:

Step 1: import tkinter package
Step 2: define functions that works on button actions
Step 3: Create multiple labels and Text fields according to the requirement
Step 4: Call the defined functions in the command methods of button.
Step 5: Call the mainloop
Step 6: Exit

Program:

```
from tkinter import *
from tkinter import ttk
def donothing():
    filewin = Toplevel(root)
```

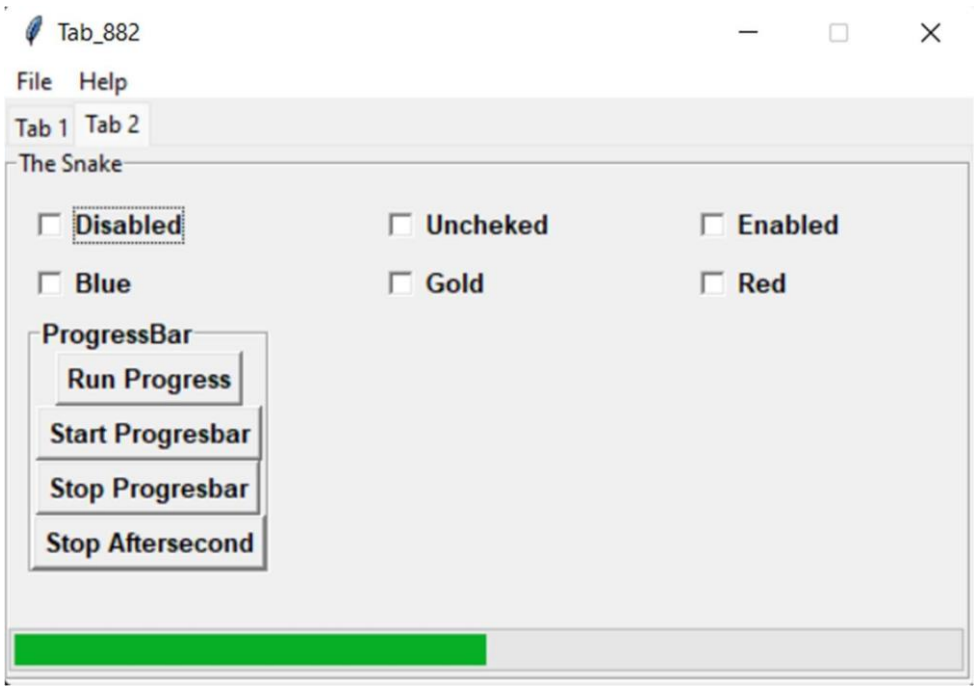
```
    button = Button(filewin, text="Do nothing button")     button.pack() f
= "Helvetica 13 bold" root = Tk()
root.geometry("500x300")


root.title("Tab_882") root.resizable(0,0) menubar = Menu(root) filemenu =
Menu(menubar, tearoff=0) filemenu.add_command(label="New",
command=donothing) filemenu.add_command(label="Open",
command=donothing) filemenu.add_command(label="Save",
command=donothing) filemenu.add_command(label="Save as...",
command=donothing) filemenu.add_command(label="Close",
command=donothing) filemenu.add_separator()
filemenu.add_command(label="Exit", command=root.quit)
menubar.add_cascade(label="File", menu=filemenu) helpmenu =
Menu(menubar, tearoff=0) helpmenu.add_command(label="Help Index",
command=donothing) helpmenu.add_command(label="About...",
command=donothing) menubar.add_cascade(label="Help", menu=helpmenu)
tabControl = ttk.Notebook(root) tab1 = ttk.Frame(tabControl) tab2 =
ttk.Frame(tabControl) tabControl.add(tab1, text="Tab 1")
tabControl.add(tab2, text="Tab 2") tabControl.pack(expand=1, fill="both")
label_frame = LabelFrame(tab2, text="The Snake")
label_frame.pack(expand=YES, fil=BOTH)
disabledCheckBox = Checkbutton(label_frame, text="Disabled", font="Ariel 10 bold").place(x=10, y=10)
unCheckedCheckBox = Checkbutton(label_frame, text="Uncheked", font="Ariel 10 bold").place(x=190, y=10)
enabledCheckBox = Checkbutton(label_frame, text="Enabled", font="Ariel 10 bold").place(x=350, y=10)
blueCheckBox = Checkbutton(label_frame, text="Blue", font="Ariel 10 bold").place(x=10, y=40)
goldCheckBox = Checkbutton(label_frame, text="Gold", font="Ariel 10 bold").place(x=190, y=40)
redCheckBox = Checkbutton(label_frame, text="Red", font="Ariel 10 bold").place(x=350, y=40)
progressBarLabelFrame = LabelFrame(label_frame, text="ProgressBar", font="Ariel 10 bold")
progressBarLabelFrame.place(x=10, y=70) runProgressButton = Button(progressBarLabelFrame, text="Run
Progress", font="Ariel 10 bold").grid( row=0, column=0
```

)

```
startProgressBar = Button(progressBarLabelFrame, text="Start Progresbar", font="Ariel 10 bold").grid( row=1,
column=0
) stopProgressBar = Button(progressBarLabelFrame, text="Stop Progresbar", font="Ariel 10 bold").grid( row=2,
column=0
) stopAfterSecond = Button(progressBarLabelFrame, text="Stop Aftersecond", font="Ariel 10  bold").grid(row=3,
column=0) progress = ttk.Progressbar(
label_frame, orient=HORIZONTAL,style="green.Horizontal.TProgressbar", length=490,
mode="determinate",maximum=4, value=2
)
progress.pack(ipady=20) progress.place(x=0, y=230)
root.config(menu=menubar) root.mainloop()
```

Input/Output:



Result: Hence the Event Driven Programming has been implemented and compiled successfully.

18CSC207J-Advanced Programming Practice
SRM Institute of Science & Engineering- Kattankulathur Campus
School of Computing

Aim: To implement Declarative Programming Paradigm

Problem:

Create the below table and execute the insert, update and the below select statements.

i) Write a query to display the total number of recipes available with the description “Chinese” ii) Write a query to display the id, name of the recipes with chef_id 'BL000002'.
iii) Write a query to display the description of the recipes whose name begins with 'P'.

Algorithm:

Step 1: import sqlite3 package
Step 2: connect the database to store,retrieve table & records
Step 3: Create a table using CREATE TABLE command
Step 4: Insert records in the table using INSERT command
Step 5: commit/save the record into the Table
Step 6: Execute the sql query one by one and print the result accordingly

Program:

```
import sqlite3 conn_882=sqlite3.connect('week4.db')
print("Opened database successfully")
conn_882.execute("CREATE TABLE recipes(id INT PRIMARY KEY NOT NULL,name VARCHAR,description
TEXT,category_id INT,chef_id text,created DATETIME);") print("Table created successfully")
conn_882.execute("INSERT INTO recipes VALUES(101,'Chicken
Mugali','Indian',01,'BL00001','2022-02-14');") conn_882.execute("INSERT INTO recipes
VALUES(102,'Hakka noodels','Chinese',02,'BL00002','2022-02-14');")
conn_882.execute("INSERT INTO recipes VALUES(103,'Octopus Soup','Chinese',03,'BL00003','2022-02-14');")
conn_882.execute("INSERT INTO recipes VALUES(104,'Pasta','Italian',04,'BL00004','2022-02-
14');") conn_882.commit()
print("Records inserted successfully"); print("\nDisplaying the table \n")
for rows in conn_882.execute("SELECT * from recipes;"):
```

```
    print(rows)
```

```
print("\nPART A\n") for rows in conn_882.execute("SELECT * from recipes WHERE
description='Chinese';"):
    print(rows)
print("\nPART B\n") for rows in conn_882.execute("SELECT id,name from recipes WHERE
chef_id='BL00002';"):
    print(rows)
print("\nPART C\n") for rows in conn_882.execute("SELECT description from recipes WHERE name LIKE
'P%';"):
    print(rows) conn_882.close()
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Download
s\network\python\lab5\1.py"
Opened database successfully
Table created successfully
Records inserted successfully

Displaying the table

(101, 'Chicken Mugali', 'Indian', 1, 'BL00001', '2022-02-14')
(102, 'Hakka noodels', 'Chinese', 2, 'BL00002', '2022-02-14')
(103, 'Octopus Soup', 'Chinese', 3, 'BL00003', '2022-02-14')
(104, 'Pasta', 'Italian', 4, 'BL00004', '2022-02-14')

PART A

(102, 'Hakka noodels', 'Chinese', 2, 'BL00002', '2022-02-14')
(103, 'Octopus Soup', 'Chinese', 3, 'BL00003', '2022-02-14')

PART B

(102, 'Hakka noodels')

PART C

('Italian',)
```

Problem:

Create a table movie of the below structure and assume data types.Movie_ID, Movie_Name, Genre, Language, Rating ,Do the following queries

a. Update the movies rating by 10% and display it
b. Delete the movies with movie_id 102
c. Select movies whose rating is more than 3.

Algorithm:

Step 1: import sqlite3 package
Step 2: connect the database to store,retrieve table & records
Step 3: Create a table using CREATE TABLE command

Step 4: Insert records in the table using INSERT command
Step 5: commit/save the record into the Table
Step 6: Execute the sql query one by one and print the result accordingly

Program:

```
import sqlite3 conn_882=sqlite3.connect('week4.db')
print("Opened database successfully")
conn_882.execute("CREATE TABLE movie(Movie_ID INT PRIMARY KEY NOT NULL,Movie_Name
VARCHAR,Genre TEXT,Language text,Rating FLOAT);") print("Table created successfully")
conn_882.execute("INSERT INTO movie VALUES(101,'Interstellar','Sci-fi','English',8.3);") conn_882.commit()
conn_882.execute("INSERT INTO movie VALUES(102,'The Batman','Superhero','English',8.2);")
conn_882.commit() conn_882.execute("INSERT INTO movie VALUES(103,'Top Gun','Action','English',8.0);")
conn_882.commit() print("Records inserted successfully"); print("\nDisplaying the table \n") for rows in
conn_882.execute("SELECT * from movie;"):
    print(rows) print("\nPART A\n")
conn_882.execute("UPDATE movie SET rating=rating+0.1*rating;")
print("Rating updated successfully") for rows in conn_882.execute("SELECT *
from movie;"):
    print(rows) print("\nPART B\n")
conn_882.execute("DELETE from movie WHERE Movie_Id=102;") print("\nRecord
Deleted Successfully") print("\nPART C\n") for rows in conn_882.execute("SELECT *
from movie WHERE rating>3;"):
    print(rows)
conn_882.close()
```

Input/Output:

```
PS C:\> python -u "c:\Users\nikhi\Downloads\network\python\lab5\2.py"
Opened database successfully
Table created successfully
Records inserted successfully

Displaying the table

(101, 'Interstellar', 'Sci-fi', 'English', 8.3)
(102, 'The Batman', 'Superhero', 'English', 8.2)
(103, 'Top Gun', 'Action', 'English', 8.0)

PART A

Rating updated successfully
(101, 'Interstellar', 'Sci-fi', 'English', 9.13)
(102, 'The Batman', 'Superhero', 'English', 9.02)
(103, 'Top Gun', 'Action', 'English', 8.8)

PART B


Record Deleted Successfully

PART C

(101, 'Interstellar', 'Sci-fi', 'English', 9.13)
(103, 'Top Gun', 'Action', 'English', 8.8)
```

Problem:

Create a course database with the following fields Product(ID, Prod_name, Supplier_id,Unit_price,Package,OrderID),OrderItem(ID,Order_id,Product_id,Unit_price,Quantity) using Foreign key

d. Display the total quantity of every product in the stock

e. Sort the Unit_price based on the supplier_id

f. Display the Product_name along with order_id and supplier_id

Algorithm:

Step 1: import sqlite3 package
Step 2: connect the database to store,retrieve table & records
Step 3: Create a table using CREATE TABLE command
Step 4: Insert records in the table using INSERT command
Step 5: commit/save the record into the Table
Step 6: Execute the sql query one by one and print the result accordingly

Program:

```
import sqlite3
conn_882=sqlite3.connect('course.db')
print("Opened database successfully")
conn_882.execute("CREATE TABLE Product(ID INT PRIMARY KEY NOT NULL,Prod_name
VARCHAR,Supplier_id text,Unit_price FLOAT,Package TEXT,order_ID text);")
conn_882.execute("CREATE TABLE OrderItem(ID INT PRIMARY KEY NOT NULL,Unit_price
FLOAT,order_ID text,Product_ID TEXT,quantity INT, FOREIGN KEY(order_ID) REFERENCES
Product(order_ID));")
print("Tables created successfully")
conn_882.execute("INSERT INTO Product VALUES(1,'Car','s01',3450.7,5,'o01');")
```

```
conn_882.execute("INSERT INTO Product VALUES(2,'Bike','s02',2450.3,4,'o02');")
conn_882.execute("INSERT INTO OrderItem VALUES(1,3450.7,'o01','p01',8);")
conn_882.execute("INSERT INTO OrderItem VALUES(2,2450.3,'o02','p02',10);")
conn_882.commit()
print("Records Inserted Successfully")
print("Showing Table Product\n")
for rows in conn_882.execute("SELECT * from Product"):
    print(rows)
print("\nShowing Table OrderItem\n")
for rows in conn_882.execute("SELECT * from OrderItem"):
    print(rows)
print("\nPart A\n")
for rows in conn_882.execute("SELECT Product.Prod_name,OrderItem.quantity FROM
Product,OrderItem where Product.order_ID=OrderItem.order_ID;"):
    print(rows)
print("\nPart B\n")
for rows in conn_882.execute("SELECT Unit_Price FROM Product ORDER BY Supplier_id"):
    print(rows)
print("\nPart C\n")
for rows in conn_882.execute("SELECT Prod_name,order_ID,Supplier_id FROM PRODUCT"):
    print(rows)
conn_882.close()
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Download
s\network\python\lab5\3.py"
Opened database successfully
Tables created successfully
Records Inserted Successfully
Showing Table Product

(1, 'Car', 's01', 3450.7, '5', 'o01')
(2, 'Bike', 's02', 2450.3, '4', 'o02')

Showing Table OrderItem

(1, 3450.7, 'o01', 'p01', 8)
(2, 2450.3, 'o02', 'p02', 10)

Part A

('Car', 8)
('Bike', 10)

Part B

(3450.7,)
(2450.3,)

Part C

('Car', 'o01', 's01')
('Bike', 'o02', 's02')
```

Problem:

Write a SQL lite3 statement to create a table named as job including columns job_id,job_title,Min-salary,Max_salary.job_id column does not contain any duplicate value at the time of insertion

Algorithm:

Step 1: import sqlite3 package

Step 2: connect the database to store,retrieve table & records
Step 3: Create a table using CREATE TABLE command
Step 4: Insert records in the table using INSERT command
Step 5: commit/save the record into the Table
Step 6: Execute the sql query one by one and print the result accordingly

Program:

```
import sqlite3 conn_882=sqlite3.connect('week4.db')
print("Opened database successfully")
conn_882.execute("CREATE TABLE job(job_id INT PRIMARY KEY NOT NULL,job_title
text,Min_salary INT,Max_salary INT);") print("Table created successfully") conn_882.execute("INSERT
INTO job VALUES(01,'Front End Developer',60000,200000);") conn_882.execute("INSERT INTO job
VALUES(02,'Back End Developer',50000,150000);") conn_882.commit() print("Records inserted
successfully"); print("\nDisplaying the table\n") for rows in conn_882.execute("SELECT * from job;"):
    print(rows) conn_882.close()
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Download
s\network\python\lab5\4.py"
Opened database successfully
Table created successfully
Records inserted successfully

Displaying the table

(1, 'Front End Developer', 60000, 200000)
(2, 'Back End Developer', 50000, 150000)
```

Problem:

Write a SQL lite3 statement to create a table names as job_history including columns employee_id, start_date, end_date, job_id and department_id and make sure that, the employee_id column does not contain any duplicate value at the time of insertion and the foreign key column job_id contain only those values which are exists in the jobs table.

Algorithm:

Step 1: import sqlite3 package
Step 2: connect the database to store,retrieve table & records
Step 3: Create a table using CREATE TABLE command
Step 4: Insert records in the table using INSERT command
Step 5: commit/save the record into the Table
Step 6: Execute the sql query one by one and print the result accordingly

Program:

```
import sqlite3
conn_882=sqlite3.connect('week4.db') print("Opened database successfully")
conn_882.execute("CREATE TABLE job(job_id INT PRIMARY KEY NOT NULL,job_title
text,Min_salary INT,Max_salary INT);")
conn_882.execute("CREATE TABLE job_history(employee_id INT PRIMARY KEY NOT
NULL,start_date text,end_date text,job_id INT,depatment_id INT, FOREIGN KEY(job_id) REFERENCES
job(job_id));") print("Tables created successfully")
conn_882.execute("INSERT INTO job VALUES(01,'Front End Developer',60000,200000);")
conn_882.execute("INSERT INTO job VALUES(02,'Back End Developer',50000,150000);")
conn_882.execute("INSERT INTO job_history VALUES(101,'1/Jan/2022','10/May/2022',01,454);")
conn_882.execute("INSERT INTO job_history  VALUES(102,'1/Jan/2021','31/Dec/2021',02,654);")
conn_882.commit() print("Records inserted successfully"); print("\nDisplaying the table job\n") for rows in
conn_882.execute("SELECT * from job;"):
   print(rows) print("\nDisplaying the table job_history\n") for rows in
conn_882.execute("SELECT * from job_history;"):
   print(rows) conn_882.close()
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Download
s\network\python\lab5\5.py"
Opened database successfully
Tables created successfully
Records inserted successfully

Displaying the table job

(1, 'Front End Developer', 60000, 200000)
(2, 'Back End Developer', 50000, 150000)

Displaying the table job_history

(101, '1/Jan/2022', '10/May/2022', 1, 454)
(102, '1/Jan/2021', '31/Dec/2021', 2, 654)
```

Result: Hence the Declarative Programming has been implemented and compiled successfully.

18CSC207J-Advanced Programming Practice
SRM Institute of Science & Engineering- Kattankulathur
Campus School of Computing

Aim: To implement Network Programming

Problem:

Create Simple Client Server Application using TCP Socket where server issue a command which will be executed at the client slide as a process of remote command execution.

Algorithm:

Client

Step 1: import the socket module
Step 2: Create a socket object
Step 3: Choose a local machine name
Step 4: Reserve a part for your service
Step 5: Connect the host and port together
Step 6: Close the socket when done

Server

Step 1: import the socket module
Step 2: Create a socket object
Step 3: Choose a local machine name
Step 4: Reserve a part for your service
Step 5: Bind the port and host
Step 6: Now wait for client connection Step 7:
Establish the connection with the client

Program:

Client.py

```
import socket # Import socket module import os s = socket.socket() #
Create a socket object host = socket.gethostname() # Get local
machine name port = 12345 # Reserve a port for your service.
s.connect((host, port)) cmd1=
s.recv(1024) cmd1=str(cmd1,'utf-
8') print(cmd1) os.system(cmd1)
s.send(b'Command Executed')
s.close() # Close the socket when done
```

Server.py

```
import socket # Import socket module s = socket.socket() # Create a
socket object host = socket.gethostname() # Get local machine name
port = 12345 # Reserve a port for your service. s.bind((host, port)) #
Bind to the port
```

```
s.listen(5) # Now wait for client connection.
while True:
    c,addr = s.accept() # Establish connection with client.
    print ('Got connection from', addr)
    c.send(b'id')
    print (c.recv(1024))
    c.close() # Close the connection
```

```
C:\Users\nikhi\Downloads\network\python\GUIpython>python q1.py
Got connection from ('10.6.193.45', 49775)
```

Problem:

Write a Socket-based Python server program that responds to client messages asfollows: When it receives a message from a client, it simply converts the message into alluppercase letters and sends back the same to the client. Write both client and serverprograms demonstrating this.

Algorithm:

Client

Step 1: import the socket module
Step 2: Create a socket object
Step 3: Choose a local machine name
Step 4: Reserve a part for your service
Step 5: Connect the host and port togetherq
Step 6: Close the socket when done

Server

Step 1: import the socket module
Step 2: Create a socket object
Step 3: Choose a local machine name
Step 4: Reserve a part for your service
Step 5: Bind the port and host
Step 6: Now wait for client connection
Step 7: Establish the connection with the client

Program:

Client.py

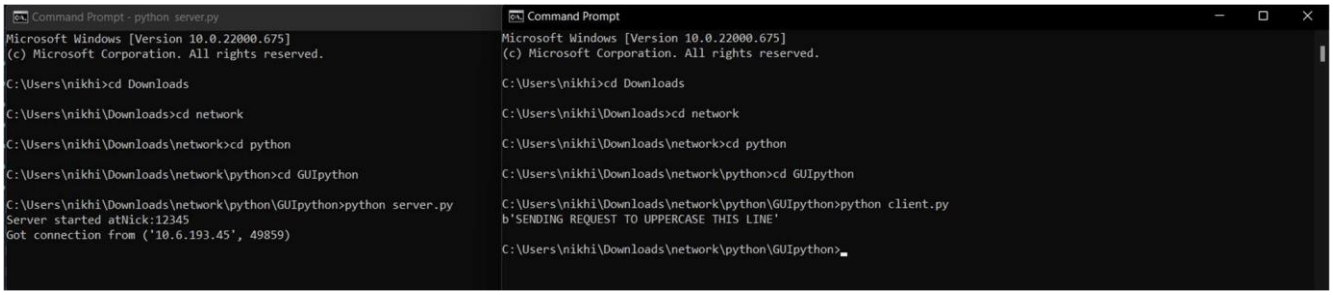
```
import socket
# Import socket module
import os
s = socket.socket()
# Create a socket object
host = socket.gethostname()
# Get local machine name
port =12345
# Reserve a port for your service.
s.connect((host, port))
```

```
s.send(b"Sending request to UpperCase this line") res1 =
s.recv(1024) print(res1) s.close()
# Close the socket when done
```

Server.py

```
import socket
# Import socket module s =
socket.socket() # Create a socket
object host = socket.gethostname()
# Get local machine name port
=12345
# Reserve a port for your service.
s.bind((host, port)) # Bind to the port print(f'Server
started at{host}:{port}') s.listen(5)
# Now wait for client connection.
while True:
      c, addr = s.accept()
      # Establish connection with client.  print ('Got
     connection from', addr)  req1 = c.recv(1024)
     req1 =str(req1,'utf-8')  str1 = req1.upper()  #
     print(str1)  str1 =bytes(str1,'UTF-8')
     c.send(str1)
      c.close()
      # Close the connection
```

Input/Output:



Problem:

Write a ping-pong client and server application. When a client sends a ping message to the server, the server will respond with a pong message. Other messages sent by the client can be safely dropped by the server.

Algorithm:

Client

Step 1: import the socket module

Step 2: Create a socket object
Step 3: Choose a local machine name
Step 4: Reserve a part for your service
Step 5: Connect the host and port togetherq
Step 6: Close the socket when done

Server

Step 1: import the socket module
Step 2: Create a socket object
Step 3: Choose a local machine name
Step 4: Reserve a part for your service
Step 5: Bind the port and host
Step 6: Now wait for client connection
Step 7: Establish the connection with the client

Program:

Client.py

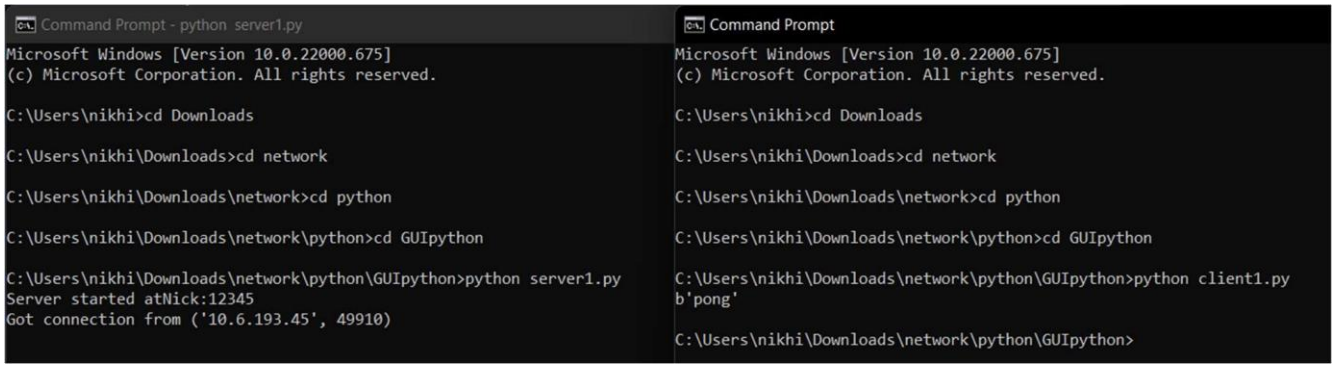
```
# echo-client.py import socket
# Import socket module import os
s = socket.socket() # Create a
socket object host =
socket.gethostname() # Get local
machine name port =12345
# Reserve a port for your service.
s.connect((host, port))
s.send(b"ping") res1 =
s.recv(1024) print(res1)
s.close()
# Close the socket when done
```

Server.py

```
# echo-server.py
# If port is in use try kill -9 $(lsof -t -i tcp:12345) import socket
# Import socket module s =
socket.socket() # Create a socket
object host = socket.gethostname()
# Get local machine name port
=12345
# Reserve a port for your service.
```

```
s.bind((host, port)) # Bind to the port print(f'Server
started at{host}:{port}') s.listen(5)
# Now wait for client connection.
while True:
      c, addr = s.accept()
      # Establish connection with client.  print ('Got
     connection from', addr)  req1 = c.recv(1024)
     req1 =str(req1,'utf-8')  if(req1=="ping"):
            c.send(b'pong')  #
     print(str1)  c.close()
      # Close the connection
```

Input/Output:



Problem:

Write a Socket based program server-client you simulate a simple chat application where the server is multithreaded which can serve for multiple clients at the same time.

Algorithm:

Client

Step 1: import the socket module
Step 2: Create a socket object
Step 3: Choose a local machine name
Step 4: Reserve a part for your service
Step 5: Connect the host and port togetherq
Step 6: Close the socket when done

Server

Step 1: import the socket module
Step 2: Create a socket object
Step 3: Choose a local machine name
Step 4: Reserve a part for your service
Step 5: Bind the port and host
Step 6: Now wait for client connection

Step 7: Establish the connection with the client

Program:

Client.py

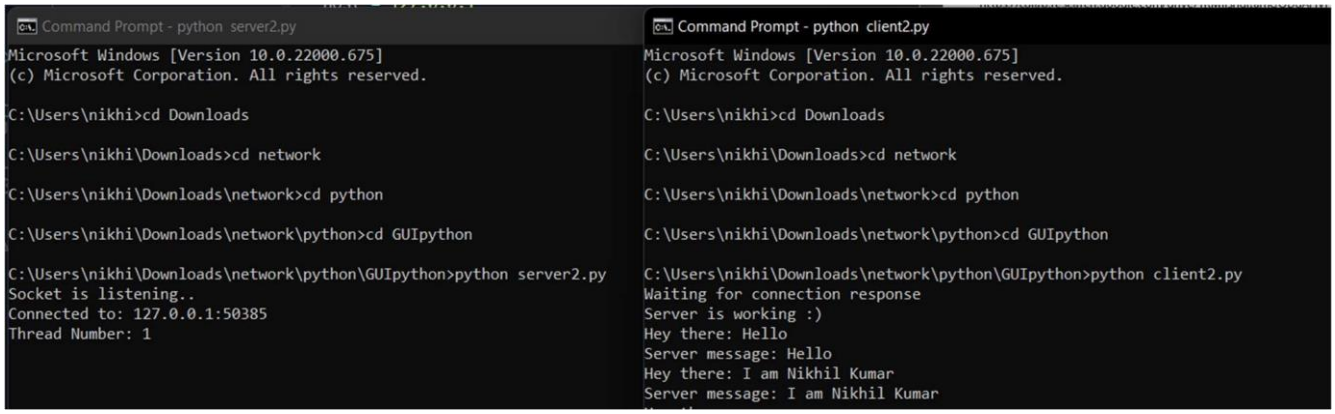
```
import socket
ClientMultiSocket = socket.socket() host ='127.0.0.1'
port =2004 print('Waiting for connection response')
try:
    ClientMultiSocket.connect((host, port)) except socket.error as
e:
    print(str(e)) res =
ClientMultiSocket.recv(1024)
print(str(res,'utf-8')) while True :
    Input =input('Hey there: ')
    ClientMultiSocket.send(str.encode(Input))     res =
ClientMultiSocket.recv(1024)     print(res.decode('utf-8'))
ClientMultiSocket.close()
```

Server.py

```
import socket import os
from _thread import *
ServerSideSocket = socket.socket() host
='127.0.0.1' port =2004 ThreadCount =0 try:
    ServerSideSocket.bind((host, port)) except socket.error as
e:
    print(str(e))
print('Socket is listening..')
ServerSideSocket.listen(5) def
multi_threaded_client(connection):
    connection.send(str.encode('Server is working :)'))     while True:
        data = connection.recv(2048)         response ='Server message: '+
data.decode('utf-8')         if not data:             break
connection.sendall(str.encode(response))
```

```
   connection.close() while True:
   Client, address = ServerSideSocket.accept()
   print('Connected to: '+ address[0] +':'+str(address[1]))
start_new_thread(multi_threaded_client, (Client, ))     ThreadCount +=1
   print('Thread Number: '+str(ThreadCount))
ServerSideSocket.close()
```

Input/Output:



Result: Hence the Network Programming has been implemented and compiled successfully.

18CSC207J-Advanced Programming Practice
SRM Institute of Science & Engineering- Kattankulathur Campus
School of Computing

Aim : To implement concurrent programming

Problem:

Modify the provided ReverseHelloMultithreaded file so that it creates a thread (let's call it Thread 1). Thread 1 creates another thread (Thread 2); Thread 2 creates Thread 3; and so on, up to Thread 50. Each thread should print "Hello from Thread <num>!", but you should structure your program such that the threads print their greetings in reverse order. When complete, ReverseHelloTest should run successfully.

Program:

```
import time # import time module
import threading
from threading import *

ThreadCount = 0
def req_thread(num): # define a square calculating function
    if num<=0:
        return 0
    req_thread(num-1)
    print(f'Hello from Thread {num+1}! I am Thread {num} :)')
t = time.time()
th1 = threading.Thread(target=req_thread, args=(50, ))
th1.start()
th1.join()
print(" Total time taking by threads is :", time.time() - t) # print the total time
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\python\GUIpython\tempCodeRunnerFile.py"
Hello from Thread 2! I am Thread 1 :)
Hello from Thread 3! I am Thread 2 :)
Hello from Thread 4! I am Thread 3 :)
Hello from Thread 5! I am Thread 4 :)
Hello from Thread 6! I am Thread 5 :)
Hello from Thread 7! I am Thread 6 :)
Hello from Thread 8! I am Thread 7 :)
Hello from Thread 9! I am Thread 8 :)
Hello from Thread 32! I am Thread 31 :)
Hello from Thread 33! I am Thread 32 :)
Hello from Thread 34! I am Thread 33 :)
Hello from Thread 35! I am Thread 34 :)
Hello from Thread 36! I am Thread 35 :)
Hello from Thread 37! I am Thread 36 :)
Hello from Thread 38! I am Thread 37 :)
Hello from Thread 39! I am Thread 38 :)
Hello from Thread 40! I am Thread 39 :)
Hello from Thread 41! I am Thread 40 :)
Hello from Thread 42! I am Thread 41 :)
Hello from Thread 43! I am Thread 42 :)
Hello from Thread 44! I am Thread 43 :)
Hello from Thread 45! I am Thread 44 :)
Hello from Thread 46! I am Thread 45 :)
Hello from Thread 47! I am Thread 46 :)
Hello from Thread 48! I am Thread 47 :)
Hello from Thread 49! I am Thread 48 :)
Hello from Thread 50! I am Thread 49 :)
Hello from Thread 51! I am Thread 50 :)
 Total time taking by threads is : 0.01717209815979004
```

Problem:

To make sure that the producer won't try to add data into the buffer if it's full and that the consumer won't try to remove data from an empty buffer.

Program:

```
import threading  import time

# Shared Memory variables  CAPACITY = 10
buffer = [-1 for i in range(CAPACITY)]  in_index
= 0 out_index = 0

# Declaring Semaphores mutex =
threading.Semaphore() empty =
threading.Semaphore(CAPACITY)  full =
threading.Semaphore(0)

#      Producer      Thread      Class      class
Producer(threading.Thread):
   def run(self):
       global CAPACITY, buffer, in_index, out_index         global
mutex, empty, full
       items_produced = 0
counter = 0
       while items_produced < 20:
          empty.acquire()             mutex.acquire()
           counter += 1             buffer[in_index] = counter
in_index = (in_index + 1)%CAPACITY             print("Producer
produced : ", counter)

          mutex.release()             full.release()

          time.sleep(1)             items_produced += 1
#      Consumer      Thread      Class      class
Consumer(threading.Thread):
   def run(self):
      global CAPACITY, buffer, in_index, out_index, counter
```

```
        global mutex, empty, full
         items_consumed = 0
         while items_consumed < 20:
            full.acquire()              mutex.acquire()
             item = buffer[out_index]             out_index = (out_index +
1)%CAPACITY              print("Consumer consumed item : ", item)
             mutex.release()
empty.release()
             time.sleep(2.5)
items_consumed += 1
# Creating Threads  producer =
Producer()  consumer = Consumer()

# Starting Threads  consumer.start()
producer.start()

# Waiting for threads to complete
producer.join() consumer.join()
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python>                > python -u "c:\Users\nikhi\Do
wnloads\network\python\GUIpython\tempCodeRunnerFile.py"
Producer produced :  1
Consumer consumed item :  1
Producer produced :  2
Producer produced :  3
Consumer consumed item :  2
Producer produced :  4
Producer produced :  5
Consumer consumed item :  3
Producer produced :  6
Producer produced :  7
Producer produced :  8
Consumer consumed item :  4
Producer produced :  9
Producer produced :  10
Consumer consumed item :  5
Producer produced :  11
Producer produced :  12
Producer produced :  13
Consumer consumed item :  6
Producer produced :  14
Producer produced :  15
Consumer consumed item :  7
Producer produced :  16
Producer produced :  17
Consumer consumed item :  8
Producer produced :  18
Consumer consumed item :  9
Producer produced :  19
Consumer consumed item :  10
Producer produced :  20
Consumer consumed item :  11
Consumer consumed item :  12
Consumer consumed item :  13
Consumer consumed item :  14
Consumer consumed item :  15
Consumer consumed item :  16
Consumer consumed item :  17
Consumer consumed item :  18
Consumer consumed item :  19
Consumer consumed item :  20
```

Result: Hence the Concurrent Programming has been implemented and compiled successfully

18CSC207J-Advanced Programming Practice
SRM Institute of Science & Engineering- Kattankulathur
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Aim : To implement Parallel Programming

Problem:

The Dining Philosopher Problem – The Dining Philosopher Problem states that K philosophers seated around a circular table with one chopstick between each pair of philosophers. There is one chopstick between each philosopher.

Program:

```
import threading import
time


# inheriting threading class in Thread module class
Philosopher(threading.Thread):
    running = True  # used to check if everyone is finished eating

    # Since the subclass overrides the constructor, it must make sure to invoke the base class constructor (
    # Thread.__init__()) before doing anything else to the thread.
    def __init__(self, index, forkOnLeft, forkOnRight):
        threading.Thread.__init__(self)
        self.index = index  self.forkOnLeft =
        forkOnLeft  self.forkOnRight =
        forkOnRight

    def run(self):
        while (self.running):
            # Philosopher is thinking (but really is sleeping).
            time.sleep(30)  print('Philosopher %s is hungry.' % self.index)
            self.dine()

    def dine(self):
        # if both the semaphores(forks) are free, then philosopher will eat  fork1, fork2 =
        self.forkOnLeft, self.forkOnRight  while self.running:
            fork1.acquire()  # wait operation on left fork  locked = fork2.acquire(False)  if
            locked: break  # if right fork is not available leave left fork  fork1.release()
            print('Philosopher %s swaps forks.' % self.index)  fork1, fork2 = fork2, fork1
        else:
            return
```

```
        self.dining()
        # release both the fork after dining          fork2.release()
fork1.release()
    def dining(self):          print('Philosopher %s starts eating. ' % self.index)
time.sleep(30)
        print('Philosopher %s finishes eating and leaves to think.' % self.index)


def main():     forks = [threading.Semaphore() for n in range(5)]  # initialising array of semaphore i.e forks

    # here (i+1)%5 is used to get right and left forks circularly between 1-5      philosophers =
[Philosopher(i, forks[i % 5], forks[(i + 1) % 5])                  for i in range(5)]

    Philosopher.running = True      for p in
philosophers: p.start()     time.sleep(100)
    Philosopher.running = False      print("Now we're
finishing.")


if __name__ == "__main__":
    main()
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\py
thon\lab6\6_dining_philosopher.py"
Philosopher 3 is hungry.Philosopher 0 is hungry.
Philosopher 0 starts eating.

Philosopher 3 starts eating. Philosopher 4 is hungry.
Philosopher 2 is hungry.
Philosopher 1 is hungry.
Philosopher 2 swaps forks.

Philosopher 0 finishes eating and leaves to think.
Philosopher 1 starts eating.
Philosopher 3 finishes eating and leaves to think.
Philosopher 4 starts eating.
Philosopher 2 swaps forks.
Philosopher 1 finishes eating and leaves to think.Philosopher 0 is hungry.

Philosopher 2 starts eating.
Philosopher 4 finishes eating and leaves to think.
Philosopher 3 is hungry.Philosopher 0 starts eating.

Now we're finishing.
```

Problem:

Consider a situation where we have a file shared between many people.

- If one of the people tries editing the file, no other person should be reading or writing at the same time, otherwise changes will not be visible to him/her.
- However if some person is reading the file, then others may read it at the same time.

Program:

```
import threading as thread import random

global x  # Shared Data x = 0 lock = thread.Lock()  # Lock for
synchronising access


def Reader():
    global x  print('Reader is Reading!')  lock.acquire()  # Acquire the lock before Reading
    (mutex approach)  print('Shared Data:', x)  lock.release()  # Release the lock after
    Reading  print()


def Writer():
    global x  print('Writer is Writing!')  lock.acquire()  # Acquire the
    lock before Writing  x += 1  # Write on the shared memory
    print('Writer is Releasing the lock!')  lock.release()  # Release the
    lock after Writing  print()


if __name__ == '__main__':
    for i in range(0, 10):
        randomNumber = random.randint(0, 100)  # Generate a Random number between 0 and
100  if randomNumber > 50:
            Thread1 = thread.Thread(target=Reader)
            Thread1.start()  else:
            Thread2 = thread.Thread(target=Writer)  Thread2.start()

Thread1.join()
```

```
Thread2.join()
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\python\lab6\7_reader_writer.py"
Writer is Writing!
Writer is Releasing the lock!Reader is Reading!


Shared Data:Reader is Reading!
Reader is Reading!1

Reader is Reading!
Shared Data:
Writer is Writing!
1Reader is Reading!

Reader is Reading!Shared Data:

Reader is Reading!1

Writer is Writing!

Shared Data: 1

Writer is Releasing the lock!

Shared Data: 2

Shared Data: 2

Shared Data: 2

Writer is Releasing the lock!
```

Result: Hence the Parallel and Concurrent Programming has been implemented and compiled successfully

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Aim: To implement Functional Programming Paradigm

Problem:

Write a Python program to create Fibonacci series upto n using Lambda.

Algorithm:

Step 1:Create a list of 0,1
Step 2: Using map ,giving function as append in list
Step 3: Range in given as 2 Step
4: print fibonacci Program:

```
from functools import reduce

fib = lambda n: reduce(lambda x, _: x+[x[-1]+x[-2]],  range(n-2), [0, 1])

print(fib(5))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\py
thon\GUIpython\f1.py"
[0, 1, 1, 2, 3]
```

Problem:

Write a Python program to find the numbers of a given string and store them in a list, display the numbers which are bigger than the length of the list in sorted form. Use lambda function to solve the problem.

Input :
Original string: SOC 23 CTech 5 DSBS8 NWC 56 CINtel 20 5
Input/Output
Numbers in sorted form: 20
23 56

Algorithm:

Step 1: Input the string
Step 2: Length of string calculated
Step 3: Sort the list
Step 4: if x>length ,print the numbers
Program:

```
str1 = "sdf 23 safs8 5 sdfsd8 sdfs 56 21sfs 20 5" print("Original string:
",str1) str_num=[i for i in str1.split(' ')] lenght=len(str_num)
numbers=sorted([int(x) for x in str_num if x.isdigit()]) print('Numbers in
sorted form:') for i in ((filter(lambda x:x>lenght,numbers))):
    print(i,end=' ')
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\py
thon\GUIpython\f2.py"
Original string:  sdf 23 safs8 5 sdfsd8 sdfs 56 21sfs 20 5
Numbers in sorted form:
20 23 56
```

Problem:

Write a Python program to sort a given list of strings(numbers) numerically using lambda.

Algorithm:

Step 1:Enter the list
Step 2: Create a sort function
Step 3: Pass the sort function and list in map function
Step 4: print the list Program:

```
def sort_numeric_strings(nums_str):
    result = sorted(nums_str, key=lambda el: int(el))  return result
nums_str = ['4','12','45','7','0','100','200','-12','-500'] print("Original list:")
print(nums_str)
print("\nSort the said list of strings(numbers) numerically:") print(sort_numeric_strings(nums_str))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\py
thon\GUIpython\f3.py"
Original list:
['4', '12', '45', '7', '0', '100', '200', '-12', '-500']

Sort the said list of strings(numbers) numerically:
['-500', '-12', '0', '4', '7', '12', '45', '100', '200']
```

Problem:

Write a Python program to calculate the average value of the numbers in a given tuple of tuples using lambda.

Algorithm:

Step 1: Enter the numbers
Step 2: Use reduce function
Step 3: create function of (x+y)/2
Step 4: Press the function and list in reduce

Program:

```
def average_tuple(nums):
    result = tuple(map(lambda x: sum(x) / float(len(x)), zip(*nums)))  return result

nums = ((10, 10, 10), (30, 45, 56), (81, 80, 39), (1, 2, 3)) print ("Original Tuple: ")
print(nums) print("\nAverage value of the numbers of the said tuple of
tuples:\n",average_tuple(nums)) nums = ((1, 1, -5), (30, -15, 56), (81, -60, -39), (-
10, 2, 3)) print ("\nOriginal Tuple: ") print(nums) print("\nAverage value of the
numbers of the said tuple of tuples:\n",average_tuple(nums))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\py
thon\GUIpython\f4.py"
Original Tuple:
((10, 10, 10), (30, 45, 56), (81, 80, 39), (1, 2, 3))

Average value of the numbers of the said tuple of tuples:
 (30.5, 34.25, 27.0)

Original Tuple:
((1, 1, -5), (30, -15, 56), (81, -60, -39), (-10, 2, 3))

Average value of the numbers of the said tuple of tuples:
 (25.5, -18.0, 3.75)
```

Problem:

Write a Python program to find the nested lists elements, which are present in another list using lambda.

Algorithm:

Step 1: Enter both element in list
Step 2: Enter function expression as x=y
Step 3: Pass the list1 and list2 as parameters Step 4:
Print the values

Program:

```
def intersection_nested_lists(l1, l2):
    result = [list(filter(lambda x: x in l1, sublist)) for sublist in l2]  return result
nums1 = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14]
nums2 = [[12, 18, 23, 25, 45], [7, 11, 19, 24, 28], [1, 5, 8, 18, 15, 16]] print("\nOriginal lists:")
print(nums1) print(nums2) print("\nIntersection of said nested lists:")
print(intersection_nested_lists(nums1, nums2))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\py
thon\GUIpython\f5.py"

Original lists:
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14]
[[12, 18, 23, 25, 45], [7, 11, 19, 24, 28], [1, 5, 8, 18, 15, 16]]

Intersection of said nested lists:
[[12], [7, 11], [1, 5, 8]]
```

Problem:

Write a Python program to convert a given list of strings into list of lists using map function.

Algorithm:

Step 1: Create a function taking map function passing (list,string)
Step 2: Sort the result in separate list Step 3:
The list has each letter of every word Program:

```
def strings_to_listOflists(str):
    result = map(list, str)  return list(result)

colors = ["Red", "Green", "Black", "Orange"] print('Original list of strings:')
print(colors) print("\nConvert the said list of strings into list of lists:")
print(strings_to_listOflists(colors))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\py
thon\GUIpython\f6.py"
Original list of strings:
['Red', 'Green', 'Black', 'Orange']

Convert the said list of strings into list of lists:
[['R', 'e', 'd'], ['G', 'r', 'e', 'e', 'n'], ['B', 'l', 'a', 'c', 'k'], ['O', 'r', 'a', 'n
', 'g', 'e']]
```

Problem:

Write a Python program to convert all the characters in uppercase and lowercase and eliminate duplicate letters from a given sequence. Use map() function.

Algorithm:

Step 1: Enter the chaarcters in list
Step 2: Enter function as x!=y
Step 3: Pass the function and list in map Step 4:
Print it as a list

Program:

```
def change_cases(s): return str(s).upper(),
 str(s).lower()

chrars = {'a', 'b', 'E', 'f', 'a', 'i', 'o', 'U', 'a'} print("Original Characters:\n",chrars)

result = map(change_cases, chrars) print("\nAfter converting above characters in upper and lower cases\nand
eliminating duplicate letters:") print(set(result))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\py
thon\GUIpython\tempCodeRunnerFile.py"
Original Characters:
 {'f', 'U', 'o', 'b', 'E', 'a', 'i'}

After converting above characters in upper and lower cases
and eliminating duplicate letters:
{('O', 'o'), ('A', 'a'), ('E', 'e'), ('I', 'i'), ('F', 'f'), ('B', 'b'), ('U', 'u')}
```

Problem:

Write a Python program to add two given lists and find the difference between lists. Use map() function.

Algorithm:

Step 1: Enter two list
Step 2: Using map define lambda function
Step 3: Give parameters as 2 list 1
Step 4: print the list

Program:

```
nums1 = [1, 2, 3] nums2 = [4, 5, 6] print("Original list:")
print(nums1) print(nums2) result = map(lambda x, y: x + y,
nums1, nums2) print("\nResult: after adding two list")
print(list(result)) result1 = map(lambda x, y: x - y, nums1,
nums2) print("\nResult: after subtracting two list")
print(list(result1))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\py
thon\GUIpython\f9.py"
Original list:
[1, 2, 3]
[4, 5, 6]

Result: after adding two list
[5, 7, 9]

Result: after subtracting two list
[-3, -3, -3]
```

Problem:

Write a Python program to filter only vowels from given sequence.

Algorithm:

Step 1: Pass the list as parameter
Step 2: Specify the function as x=’a’ || x=’e’ || x=’o’ || x=’i’ ||x=’e’ Step 3:
If the elements match the above conditions print them in list

Program:

```
letters_882 = ['a', 'b', 'd', 'e', 'i', 'j', 'o'] def filter_vowels(letter):

    vowels = ['a', 'e', 'i', 'o', 'u']  if(letter in vowels):
            return True
    else:
           return False
```

```
filtered_vowels = filter(filter_vowels, letters_882) print('The filtered
vowels are:') for vowel in filtered_vowels:
    print(vowel)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\py
thon\GUIpython\f11.py"
The filtered vowels are:
a
e
i
o
```

Problem:

Write a python program to calculate factorial of given number (use reduce function)

Algorithm:

Step 1:Define a function manually which calculates factorial ,multiplying each value in range 1 to n
Step 2: Pass the number and the manual function in reduce function
Step 3: Print the result of reduce

Program:

```
import functools def mult(x,y):
print("x=",x," y=",y)     return
x*y

fact=functools.reduce(mult, range(1, 4)) print
('Factorial of 3: ', fact)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\network\python> python -u "c:\Users\nikhi\Downloads\network\py
thon\GUIpython\f12.py"
x= 1  y= 2
x= 2  y= 3
Factorial of 3:  6
```

Result: Hence the Functional Programming has been implemented and compiled successfully.

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Aim: To implement Symbolic Programming

Problem: Calculate sqrt (2) with 100 decimals.

Program:

```
from sympy import *
print(N(sqrt(2),100))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\GUI> python -u "c:\Users\nikhi\Download
s\GUI\A4\a4-1\a1.py"
1.4142135623730950488016887242096980785696718753769480731766797379907324784621070388503875343276415573
```

Result: Hence the program has been executed.

Problem: Calculate (1/2+1/3) in rational arithmetic.

Program:

```
import sympy as sym
a = (sym.Rational(1, 2)+sym.Rational(1,3))
print(sym.simplify(a))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\GUI> python -u "c:\Users\nikhi\Dow
nloads\GUI\A4\a4-1\a1.py"
5/6
```

Result: Hence the program has been executed.

Problem: Calculate the expanded form of (x+y) ^ 6.

Program:

```
import sympy as sym
x = sym.Symbol('x')
y = sym.Symbol('y')
a = sym.expand((x+y)**6)
print(a)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\GUI> python -u "c:\Users\nikhi\Downloads\GUI\A4\a4-1\
a1.py"
x**6 + 6*x**5*y + 15*x**4*y**2 + 20*x**3*y**3 + 15*x**2*y**4 + 6*x*y**5 + y**6
```

Result: Hence the program has been executed.

Problem: Simplify the trigonometric expression sin (x) / cos (x) Program:

```
from sympy import * x =
symbols('x') a =
(sin(x)/(cos(x)))
s=trigsimp(a)
print(format(s))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\GUI> python -u "c:\Users\nikhi\Downloads\GUI\A4\a4-1\
a1.py"
tan(x)
```

Result: Hence the program has been executed.

Problem: Calculate sin x -xx^3n Program:

```
from sympy import *
x,n=symbols('x n') exp= sin(x)-
x*x**3*n s=trigsimp(exp)
print(s)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\GUI> python -u "c:\Users\nikhi\Downloads\GUI\A4\a4-1\
a1.py"
-n*x**4 + sin(x)
```

Result: Hence the program has been executed.

Problem: Develop a python code for to carry out the operations on the given algebraic manipulation for the given expression a2 −ab+ab−b2=a2−b2 by using the symbolic programming paradigms principles.

Program:

```
import sympy as sym a =
sym.Symbol('a') b =
sym.Symbol('b')
lhs=sym.simplify(a**2-a*b+a*b-b**2)
rhs=sym.simplify(a**2-b**2) print('lhs is ',lhs)
print('rhs is ',rhs)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\GUI> python -u "c:\Users\nikhi\Downloads\GUI\A4\a4-1\
a1.py"
lhs is  a**2 - b**2
rhs is  a**2 - b**2
```

Result: Hence the program has been executed.

Problem:
Give the Symbolic program for the expression given below: a.
∫∫a 2 da

Program:

```
from sympy import * import
functools import operator
import random
a=symbols('a') g=a**2
j=integrate(g,a)
print('before integration a**2') print('after integration '+str(j))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\GUI> python -u "c:\Users\nikhi\Downloads\GUI\A4\a4-1\
a1.py"
before integration a**2
after integration a**3/3
```

Result: Hence the program has been executed.

Problem:
Give the Symbolic program for the expression given below: b.2x+y
2

Program:

```
import sympy as sym x =
sym.Symbol('x') y =
sym.Symbol('y') a =
sym.simplify(2*x+y**2) print(a)
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\GUI> python -u "c:\Users\nikhi\Downloads\GUI\A4\a4-1\
tempCodeRunnerFile.py"
2*x + y**2
```

Result: Hence the program has been executed.

Problem:

Give the Symbolic program for the expression given below:
c. 1/10 + 1/5 Program:

```
import sympy as sym
a = (sym.Rational(1, 10)+sym.Rational(1,5)) print(sym.simplify(a))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\GUI> python -u "c:\Users\nikhi\Downloads\GUI\A4\a4-1\
tempCodeRunnerFile.py"
3/10
```

Result: Hence the program has been executed.

Problem:
Give the Symbolic program for the expression given below:
d. d/dx(sin(x)) Program:

```
from sympy import *
import functools import
operator import random
a=symbols('a')
x=symbols('x') g=sin(x)
j=diff(g,a)

print('before differentiation sin(x)') print('after differentiation '+str(j))
```

Input/Output:

```
PS C:\Users\nikhi\Downloads\GUI> python -u "c:\Users\nikhi\Downloads\GUI\A4\a4-1\
tempCodeRunnerFile.py"
before differentiation sin(x)
after differentiation 0
```

Result: Hence the program has been executed.

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Aim: To implement Logic Programming

Problem:
Implement using pyDatalog:
Assume given a set of facts of the form father(name1,name2) (name1 is the father of name2).
a. Define a predicate brother(X,Y) which holds iff X and Y are brothers.
b. Define a predicate cousin(X,Y) which holds iff X and Y are cousins.
c. Define a predicate grandson(X,Y) which holds iff X is a grandson of Y.
d. Define a predicate descendent(X,Y) which holds iff X is a descendent of Y.
e. Consider the following genealogical tree:

What are the answers generated by your definitions for the queries:
brother(X,Y)
cousin(X,Y)
grandson(X,Y)
descendent(X,Y)

Program:

```
from pyDatalog import pyDatalog
pyDatalog.create_terms('a,b,c,d,e,f,brother,cousin,grandson,descendent,X,Y')
+brother('b','c')
+brother('d','e')
+cousin('d','f')
+cousin('e','f')
+grandson('d','a')
+grandson('e','a')
+grandson('f','a')
+descendent('b','a')
+descendent('c','a')
+descendent('d','b') +descendent('f','c')
print(pyDatalog.ask('brother(X,Y)')) print(pyDatalog.ask('cousin(X,Y)'))
print(pyDatalog.ask('grandson(X,Y)')) print(pyDatalog.ask('descendent(X,Y)'))
```

```
pyDatalog.create_terms('X,Y,Z,bear,elephant,cat,small,big,brown,black,gray,da
rk')
+big('elephant')
+big('bear')
+small('cat')
+black('cat')
+brown('bear') +gray('elephant')
dark(X)<=black(X) or brown(X) print(big(X),dark(X))
```

Input/Output:

{('d', 'e'), ('b', 'c')}

{('d', 'f'), ('e', 'f')}

{('e', 'a'), ('d', 'a'), ('f', 'a')}

{('f', 'c'), ('b', 'a'), ('c', 'a'), ('d', 'b')}

Result: Hence the program has been executed.

Problem:

Encode the following facts and rules in pyDatalog:

Bear is big

Elephant is big

Cat is small

Bear is brown

Cat is black

Elephant is

gray

An animal is dark if it is

black An animal is dark if it

is brown

Write a query to find which animal is dark and big.

Program:

Input/Output:

X

_____-

bear elephant

X

---

cat

Result: Hence the program has been executed.

Problem:

The following are the marks scored by 5 students.

Student Name Mark

Ram 90

Raju 45

Priya 85

Carol 70

Shyam 80

Enter the above data using pyDatalog.

Write queries for the following:

a. Print Student name and mark of all students.
b. Who has scored 80 marks?
c. What mark has been scored by Priya?

a. Write a rule ‘passm’ denoting that pass mark is greater than 50. Use the rule to print all students who failed.
b. Write rules for finding grade letters for a marks and use the rule to find the grade letter of a given mark.

```
from pyDatalog import pyDatalog
pyDatalog.create_terms('X,Y,Z,student,marks,passm,grades')
+student('ram')
+student('raju')
+student('priya')
+student('carol')
+student('shyam')
+marks('90','ram')
+marks('45','raju')
+marks('85','priya')
+marks('70','carol')
+marks('80','shyam') +grades('ram','O')
+grades('priya','A')
+grades('shyam','A')
+grades('carol','B')
+grades('raju','E') print(marks(X,Y)) print(marks('80',X)) print(marks(X,'priya'))
passm(X)<=grades(X,'E') print(passm(X))
```

45 | raju 90

Program:

Input/Output:

X | Y

|----------

80 | shyam

70 | carol

85 | priya

X

----

shyam

X

-85

X

- - -

raju

Result: Hence the program has been executed.

Problem:

Write a recursive program to find factorial of a number using pyDatalog.

Program:

```
from pyDatalog import pyDatalog
pyDatalog.create_terms('factorial, N')
num=int(input('Enter any number:')) factorial[N] =
N*factorial[N-1] factorial[1] = 1
print(factorial[num]==N)
```

Input/Output:

Enter any number:3

N

- 6

Result: Hence the program has been executed.

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Aim: To implement Automata Programming Paradigm

Problem:
Write a automata code for the Language that accepts all and only those strings that contain 001 Program:

```
from automata.fa.dfa import DFA
dfa = DFA(
states={'q0', 'q1', 'q2', 'q3'}, input_symbols={'0', '1'}, transitions={
'q0': {'0': 'q1', '1': 'q0'},
'q1': {'0': 'q2', '1': 'q0'},
'q2': {'0': 'q2', '1': 'q3'},
'q3': {'0': 'q3', '1': 'q3'}
},
initial_state='q0', final_states={'q3'}
) for i in range(1,4): num = input("Enter the
string :") if(dfa.accepts_input(num)):
        print("Accepted")
else:
        print("Rejected")
```

Input/Output

Enter the string :1001

Accepted

Enter the string :010101

Rejected

Result: Thus the given program is executed successfully.

Problem:

Write a automata code for L(M) ={ w | w has an even number of 1s}

Input/Output

Enter the string :101

Accepted

Enter the string :001

Accepted

Enter the string :720

Rejected

Result: Thus the given program is executed successfully.

Problem:

Write a automata code for L(M)=a + aa*b.

Program:

```
from automata.fa.dfa import DFA dfa = DFA(
states={'q0', 'q1', 'q2','q3','q4','q5'}, input_symbols={'a', 'b'}, transitions={
'q0': {'a': 'q1', 'b': 'q5'},
'q1': {'a': 'q2', 'b': 'q5'},
'q2': {'a': 'q3', 'b': 'q4'},
'q3': {'a': 'q2', 'b': 'q5'},
'q4': {'a': 'q5', 'b': 'q5'},
'q5': {'a': 'q5', 'b': 'q5'}
},
initial_state='q0', final_states={'q1','q4'}
) for i in range(1,6):
    num = input("Enter the string :")      if(dfa.accepts_input(num)):
        print("Accepted")      else:
print("Rejected")
```

Input/Output

Enter the string :a
Accepted
Enter the string :aab
Accepted
Enter the string :aaab
Rejected
Enter the string:abab
Rejected

Problem:

Write a automata code for L(M) ={0,1}*

Program:

```
from automata.fa.dfa  import DFA dfa =
DFA(
states={'q0'}, input_symbols={'0', '1'}, transitions={
'q0': {'0': 'q0', '1': 'q0'}
 },
initial_state='q0', final_states={'q0'}
) for i in range(1,8):
    num = input("Enter the string :")
if(dfa.accepts_input(num)):        print("Accepted")
else:        print("Rejected")
 from automata.fa.dfa  import DFA dfa
 = DFA(

 states={'q0', 'q1', 'q2'},
 input_symbols={'0', '1'}, transitions={
'q0': {'0': 'q0', '1': 'q1'},
'q1': {'0': 'q1', '1': 'q2'},
'q2': {'0': 'q2', '1': 'q1'}
 },
 initial_state='q0', final_states={'q2'}
 ) for i in range(1,4):
     num = input("Enter the string :")      if(dfa.accepts_input(num)):
         print("Accepted")      else:
         print("Rejected")
```

Input/Output

Enter the string :10101
Rejected
Enter the string :10010
Accepted

Result: Thus the given program is executed successfully.