

PRACTICAL JOURNAL

Practical : 1

Write the program for the following :

- a) Create a program that asks the user to enter their name and their age. Print out a message addressed to them that tells them the year that they will turn 100 years old.

Solution :

```
name = input("What is your name: ")
age = int(input("How old are you: "))
year = str((2017 - age)+100)
print(name + " you will be 100 years old in the year " + year)
```

Output :

```
What is your name: Sonali
How old are you: 30
Sonali you will be 100 years old in the year 2087
```

- b) Enter the number from the user and depending on whether the number is even or odd, print out an appropriate message to the user.

Solution :

```
a = int(input("Enter any number:"))
if a%2==0:
    print("It's even number")
else:
    print("It's odd number ")
```

Output :

```
Enter any number:4
It's even number
```

- c) Write a program to generate the Fibonacci series.

Solution :

```
v = int(input("\n Please Enter the Range number: "))
a = 0
b = 1
for n in range(0, v):
    if(n <= 1):
        c = n
    else:
        c = a + b
        a = b
        b = c
    print(c)
```

Output :

Please Enter the Range Number: 5

0

1

1

2

3

d) Write a function that reverses the user defined value.**Solution :**

```
def revnum(num):
    sum=0
    while num != 0:
        rem = num % 10
        sum = rem + sum * 10
        num = num // 10
    print("Reverse num : %d"%sum)

num= int(input("Enter any number:"))
revnum(num)
```

Output :

Enter any number:123

Reverse num : 321

e) Write a function to check the input value is Armstrong and also write the function for Palindrome.

(Note : An Armstrong number is a number such that the sum of its digits raised to the third power is equal to the number itself. For example, 371 is an Armstrong number, since $3^3 + 7^3 + 1^3 = 371$).

Solution :

```
def armnum(num):
    sum = 0
    temp = num
    while temp > 0:
        digit = temp % 10
        sum += digit ** 3
        temp //= 10
    if num == sum:
        print(num,"is an Armstrong number")
    else:
        print(num,"is not an Armstrong number")

def palnum(num):
```

```
sum=0
temp=num
while num != 0:
    rem = num % 10
    sum = rem + sum * 10
    num = num // 10
if temp == sum:
    print(temp, "is a palindrome number")
else:
    print(temp, "is not a palindrome number")

num= int(input("Enter any number:"))
armnum(num)
palnum(num)
```

Output :

```
Enter any number: 371
371 is an Armstrong number
371 is not a palindrome number
```

f) Write a recursive function to print the factorial for a given number.

Solution :

```
def fact(x):
    if x == 1:
        return 1
    else:
        return (x * fact(x-1))
```

```
num= int(input("Enter any number:"))
print("The factorial of", num, "is", fact(num))
```

Output :

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

Practical : 2

Write the program for the following :

- a) **Write a function that takes a character (i.e. a string of length 1) and returns True if it is a vowel, False otherwise.**

Solution :

```
def vchk(ch):
    if(ch=='a' or ch=='A' or ch=='e' or ch=='E' or ch=='i' or ch=='I'
       or ch=='o' or ch=='O' or ch=='u' or ch=='U'):
        print(ch, "is a vowel.")
    else:
        print(ch, "is not a vowel.")

ch= input("Enter any char(A-Z/a-z) only:")
vchk(ch)
```

Output :

```
Enter any char(A-Z/a-z) only:e
e is a vowel.
```

- b) **Define a function that computes the length of a given list or string.**

Solution :

```
def calen(n):
    count = 0
    for i in n:
        count=count+1
    return count

print(calen([1,3,5,7,9]))
print(calen("Sonali"))
```

Output :

```
5
6
```

- c) **Define a procedure histogram() that takes a list of integers and prints a histogram to the screen. For example, histogram([4, 9, 7]) should print the following :**

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

Solution :

```
def histogram( items ):
    for n in items:
        output = "
        times = n
```

```
while( times > 0 ):  
    output += '*'  
    times = times - 1  
print(output)
```

```
histogram([4, 9, 7])
```

Output :

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

Practical : 3

Write the program for the following :

- a) A pangram is a sentence that contains all the letters of the English alphabet at least once, for example: **The quick brown fox jumps over the lazy dog.** Your task here is to write a function to check a sentence to see if it is a pangram or not.

Solution :

```
import string, sys
def ispangram(str1, alphabet=string.ascii_lowercase):
    alphaset = set(alphabet)
    return alphaset <= set(str1.lower( ))

print(ispangram("The quick brown fox jumps over the lazy dog"))
```

Output:

True

- b) Take a list, say for example this one :

```
a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89]
```

and write a program that prints out all the elements of the list that are less than 5.

Solution :

```
a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89]
for i in a:
    if i < 5:
        print(i)
```

Output :

```
1
1
2
3
```

Practical : 4

Write the program for the following:

- a) Write a program that takes two lists and returns True if they have at least one common member.

Solution :

```
def find_common(st1, st2):
    res = False
    for x in st1:
        for y in st2:
            if x == y:
                res = True
    return res
```

```
print(find_common([4,6,8,10,12], [5,7,8,10,11]))
print(find_common([3,5,7,9,11], [2,4,6,8]))
```

Output :

```
True
None
```

- b) Write a Python program to print a specified list after removing the 0th, 2nd, 4th and 5th elements.

Solution:

```
name = ['Yashu','Vedu','Somu','Pari','Sanu','Rudra','Mou']
name = [x for (i,x) in enumerate(name) if i not in (0,2,4,5)]
print(name)
```

Output :

```
['Vedu', 'Pari', 'Mou']
```

- c) Write a Python program to clone or copy a list.

Solution :

```
L1 = [8,11,13,22,27]
L2 = list(L1)
print("L1 :",L1)
print("L2 :",L2)
```

Output :

```
L1 : [8, 11, 13, 22, 27]
L2 : [8, 11, 13, 22, 27]
```

Practical : 5

Write the program for the following :

a) Write a Python script to sort (ascending and descending) a dictionary by value.

(Note : The operator module exports a set of efficient functions corresponding to the intrinsic operators of Python).

Solution :

```
import operator
d = {1: 22, 3: 13, 4: 8, 2: 11, 0: 27}
print(d)
t = sorted(d.items(), key=operator.itemgetter(0))
print('In ascending order by value : ',t)
t = sorted(d.items(), key=operator.itemgetter(0),reverse=True)
print('In descending order by value : ',t)
```

Output:

```
{0: 27, 1: 22, 2: 11, 3: 13, 4: 8}
In ascending order by value : [(0, 27), (1, 22), (2, 11), (3, 13), (4, 8)]
In descending order by value : [(4, 8), (3, 13), (2, 11), (1, 22), (0, 27)]
```

b) Write a Python script to concatenate following dictionaries to create a new one.

Sample Dictionary : dic1={1:10, 2:20} dic2={3:30, 4:40} dic3={5:50,6:60}

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

Solution :

```
dic1={1:10, 2:20}
dic2={3:30, 4:40}
dic3={5:50, 6:60}
dic1.update(dic2)
dic1.update(dic3)
print(dic1)
```

Output :

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

c) Write a Python program to sum all the items in a dictionary.

Solution :

```
d = {'t1':10,'t2':5,'t3':25}
print(d)
print("sum : ",sum(d.values( )))
```

Output:

```
{'t1': 10, 't2': 5, 't3': 25}
sum : 40
```


Practical : 6

Write the program for the following :

a) Write a Python program to read an entire text file.

Solution :

```
# abc.txt
Hello World In Python

# f1.py
f = open('abc.txt', 'r')
t=f.read()
print(t)
f.close()
```

Output :

```
Hello World
In Python
```

b) Write a Python program to append text to a file and display the text.

Solution :

```
f = open('abc.txt','a+')
f.write('Easy to learn\n')
f = open('abc.txt','r')
t=f.read()
print(t)
f.close()
```

Output :

```
Hello World
In Python Easy to learn
Easy to learn
```

c) Write a Python program to read last n lines of a file.

Solution :

```
f = open('abc.txt', 'r')
t=f.readlines()
print(t[-1])
f.close()
```

Output :

```
In Python Easy to learn
```

Practical : 7

Write the program for the following :

- a) Design a class that store the information of student and display the same.

Solution :

```
class student:
    def info(self, studname, studaddr):
        print("Name : ",studname," Address : ",studaddr)

obj= student( )
obj.info('Veda','Airoli')
```

Output :

Name : Veda Address : Airoli

- b) Implement the concept of inheritance using python.

Solution :

```
class st:
    def s1(self):
        print("Base Class")
class st1(st):
    def s2(self):
        print("Derived Class")

t=st1( )
t.s1( )
t.s2( )
```

Output :

Base Class
Derived Class

- c) Create a class called Numbers, which has a single class attribute called MULTIPLIER, and a constructor which takes the parameters x and y (these should all be numbers).

- i) Write a method called add which returns the sum of the attributes x and y.
- ii) Write a class method called multiply, which takes a single number parameter a and returns the product of a and MULTIPLIER.
- iii) Write a static method called subtract, which takes two number parameters, b and c, and returns b - c.
- iv) Write a method called value which returns a tuple containing the values of x and y. Make this method into a property, and write a setter and a deleter for manipulating the values of x and y.

Solution :

```
class Numbers:
    MULTIPLIER = 3
```

```
def __init__(self, x, y):
    self.x = x
    self.y = y

def add(self):
    return self.x + self.y

@classmethod
def multiply(cls, a):
    return cls.MULTIPLIER * a

@staticmethod
def subtract(b, c):
    return b - c

@property
def value(self):
    return (self.x, self.y)

@value.setter
def value(self, xy_tuple):
    self.x, self.y = xy_tuple

@value.deleter
def value(self):
    del self.x
    del self.y
```

```
T=Numbers(2,4)
print(T.add())
print(T.multiply(2))
print(Numbers.subtract(4,3))
```

Output :

```
6
6
1
```

Practical : 8

Write the program for the following :

- a) Open a new file in IDLE ("New Window" in the "File" menu) and save it as geometry.py in the directory where you keep the files you create for this course. Then copy the functions you wrote for calculating volumes and areas in the "Control Flow and Functions" exercise into this file and save it.

Now open a new file and save it in the same directory. You should now be able to import your own module like this :

```
import geometry
```

Try and add `print dir(geometry)` to the file and run it.

Now write a function `pointyShapeVolume(x, y, squareBase)` that calculates the volume of a square pyramid if `squareBase` is True and of a right circular cone if `squareBase` is False. `x` is the length of an edge on a square if `squareBase` is True and the radius of a circle when `squareBase` is False. `y` is the height of the object. First use `squareBase` to distinguish the cases. Use the `circleArea` and `squareArea` from the `geometry` module to calculate the base areas.

Solution :

```
#geometry.py
```

```
import math
```

```
def sphereArea(r):
```

```
    return 4 * math.pi * r**2
```

```
def sphereVolume(r):
```

```
    return 4 * math.pi * r**3 / 3
```

```
def sphereMetrics(r):
```

```
    return sphereArea(r), sphereVolume(r)
```

```
def circleArea(r):
```

```
    return math.pi * r**2
```

```
def squareArea(x):
```

```
    return x**2
```

```
#demo.py
```

```
import geometry
```

```
def pointyShapeVolume(x, h, square):
```

```
    if square:
```

```
        base = geometry.squareArea(x)
```

```
    else:
```

```
        base = geometry.circleArea(x)
```

```
    return h * base / 3.0
```

```
print (dir(geometry))
print (pointyShapeVolume(4, 2.6, True))
print (pointyShapeVolume(4, 2.6, False))
```

b) Write a program to implement exception handling.

Solution :

```
try:
    num = int(input("Enter the number "))
    re = 100/num
except (ValueError, ZeroDivisionError) :
    print("Something is wrong")
else:
    print("result is ",re)
```

Output :

```
Enter the number 0
Something is wrong
```

Practical : 9

Write the program for the following :

- a) Try to configure the widget with various options like: `bg="red"`, `family="times"`, `size=18`

Explanation : In following program we have taken one label and three button widgets. on every button click we have changed three options of label as text, bg and font with size. For this we have written three functions in which with the help of widgets `config()` method we have changed option values of label and achieved our desired result.

Solution :

```
import tkinter as tk
win = tk.Tk()
win.title("Practical 9 A")

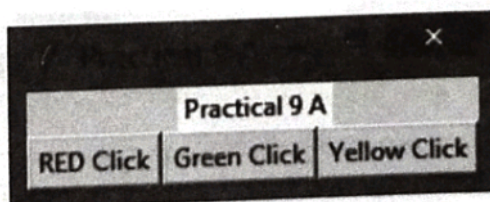
def redClick():
    label.config(text="Helvetica Font")
    label.config(bg="red")
    label.config(font=("Helvetica", 16))

def greenClick():
    label.config(text="Cambria Font")
    label.config(bg="green")
    label.config(font=("Cambria", 18))

def yellowClick():
    label.config(text="Arial Font")
    label.config(bg="yellow")
    label.config(font=("Calibri", 14))

label = tk.Label(win, text="Practical 9 A", bg='white')
label.pack()
B1 = tk.Button(win, text = "RED Click", relief='raised', command=redClick)
B1.pack(side = "left")
B2 = tk.Button(win, text = "Green Click", relief='raised', command=greenClick)
B2.pack(side = "left")
B3 = tk.Button(win, text = "Yellow Click", relief='raised', command=yellowClick)
B3.pack(side = "left")
win.mainloop()
```

Output :



- b) Try to change the widget type and configuration options to experiment with other widget types like Message, Button, Entry, Checkbutton, Radiobutton, Scale etc.

Explanation : In following example we have created a GUI with dynamically changing the widget type as well as options of the widget. On selection of the checkbox we have changed the entry box into the menu as well as changed the attributes of label, such as font type, colour and font face. For achieving this, we have created the changeable widgets inside the frames except the button. We have created a `swap()` method to achieve all the changes and configuration. Here we have made use of widgets `pack_forget()` method to toggle the widgets.

Solution :

```

from tkinter import *

def swap():
    if v.get():
        e.pack_forget()
        mb.pack(anchor="w", side="right")
        l2.config(text="Use Menu Below.")
        l2.config(bg="yellow")
        l2.config(font=("Helvetica", 16, "italic"))
    else:
        mb.pack_forget()
        e.pack(anchor="w", side="left")
        l2.config(text="Use Entry Box Below.")
        l2.config(bg="green")
        l2.config(font=("Cambria", 16, "bold"))
        e.focus()

t = Tk()
v = IntVar(t)

c = Checkbutton(t, command=swap, text="Select to use menu.", variable=v)
c.pack(anchor="w")

f1 = Frame(t)
l1 = Label(f1, text="Select the Menu item of your choice :")
l1.pack(side="left")

l2 = Label(f1, text="Use Entry Box Below.", bg="green", font=("Cambria", 16,
    "bold"))
l2.pack(side="top")
f = Frame(f1)
f.pack(side="left")
e = Entry(f, width=35)
mb = Menubutton(f, width=25, text="Veg", indicatoron=1, relief="sunken",
    anchor="w")

```

```

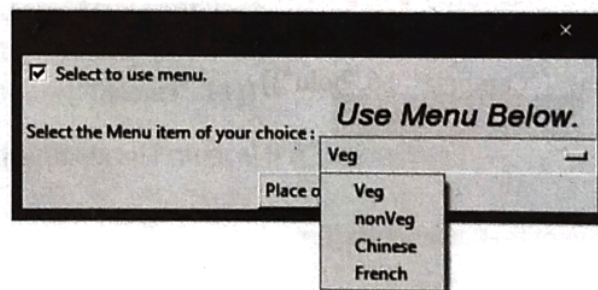
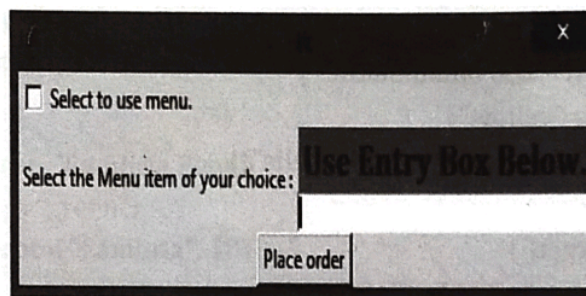
m = Menu(mb, tearoff=0); mb.configure(menu=m)
for s in "Veg nonVeg Chinese French".split( ):
    m.add_command(label=s, command=lambda s=s: mb.configure(text=s))

f.pack( )
f1.pack( )
swap( )

b = Button(t, text="Place order",relief="raised", fg="red",command=t.destroy);
b.pack(side="top")

f.mainloop( )

```

Output :

Practical : 10

Design the database applications for the following :

- a) **Design a simple database application that stores the records and retrieve the same.**

Explanation : In following example we have created a GUI which will accept the details of the books and it stores it in database on the click of insert button. When we press the show books button it displays the information stored in the database using list box.

Solution :

Step 1 : First we need to create MySQL database and database table which is required for our application as follows :

Create database Library;

Use Library;

```
CREATE TABLE books ( id int primary key auto_increment, title VARCHAR(50),
author VARCHAR(30), publisher VARCHAR(25), year VARCHAR(10),
edition VARCHAR(10));
```

Code :

#10A.py

```
from tkinter import *
```

```
from tkinter import messagebox
```

```
import mysql.connector as mysql
```

```
# 1: creating the connection to our database
```

```
conn = mysql.connect(user='root', password='root', host='127.0.0.1')
```

```
cursor = conn.cursor() # 2: obtaining the cursor
```

```
cursor.execute("USE Library") # 3: Making the database as current
```

```
def insertCall():
```

```
    # 4: creating the SQL statement with values from entry gui
```

```
    sql = "INSERT INTO books (title,author, publisher,year,edition) VALUES
```

```
    (""+bTitle.get()+"", ""+aName.get()+"", ""+pub.get()+"", ""+year.get()+"",
```

```
    ""+edi.get()+"")"
```

```
    cursor.execute(sql) # 5: Executing the query
```

```
    conn.commit() # 6: Making the changes permanent in the database
```

```
    bTitle.delete(0,END) # Clearing the text box
```

```
    aName.delete(0,END) # Clearing the text box
```

```
    pub.delete(0,END) # Clearing the text box
```

```
    year.delete(0,END) # Clearing the text box
```

```
    edi.delete(0,END) # Clearing the text box
```

```
    bTitle.focus()
```

```
    messagebox.showinfo(title='Confirmation', message="Information Inserted.")
```

```

def showBooks():
    sql = "SELECT * FROM books"
    cursor.execute(sql) # 5:Executing the query
    results = cursor.fetchall() # Fetching values from database
    lb=Label(win, text= "No. --Name--Author--publisher--year--edition", width=70)
    lbl.grid(row=6, columnspan=2)

    listbox = Listbox(win, width=70)
    listbox.grid(row=7, columnspan=2)
    for row in results: # Iterating and assigning values to list
        listbox.insert(END, row)
    conn.commit()# 6: Making the changes permanant in the database

win = Tk()
win.title("Book Details")

Label(win, text="Book Title:").grid(row=0)
Label(win, text="Author Name").grid(row=1)
Label(win, text="Publisher").grid(row=2)
Label(win, text="Year").grid(row=3)
Label(win, text="Edition").grid(row=4)

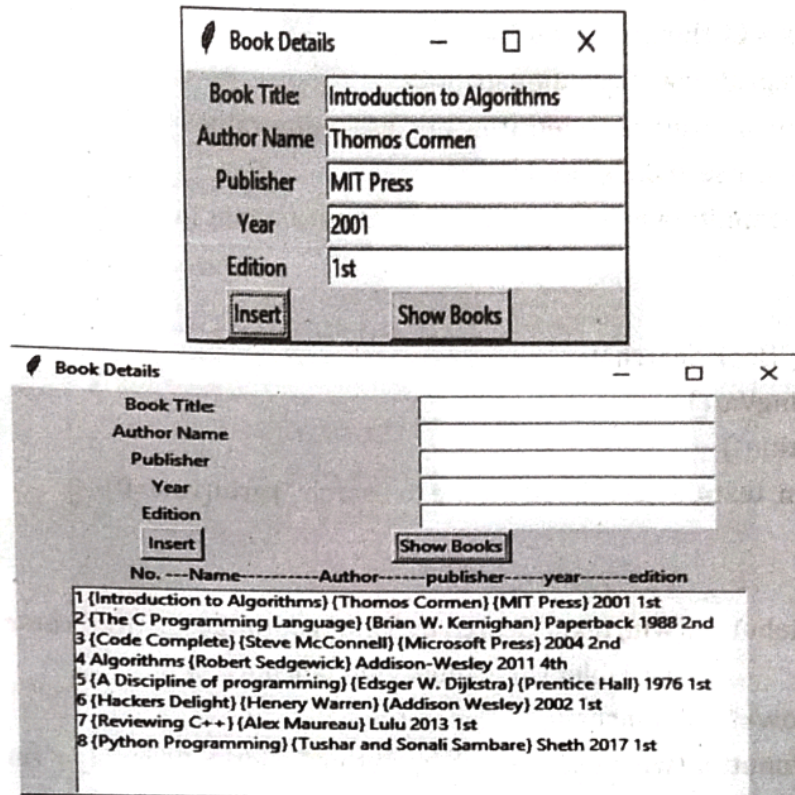
bTitle = Entry(win, width=30)
bTitle.grid(row=0, column=1)
aName = Entry(win,width=30)
aName.grid(row=1, column=1)
pub = Entry(win,width=30)
pub.grid(row=2, column=1)
year = Entry(win,width=30)
year.grid(row=3, column=1)
edi = Entry(win,width=30)
edi.grid(row=4, column=1)

b1=Button(win, text='Insert', command=insertCall)
b1.grid(row=5, column=0, padx=24)
b2=Button(win, text='Show Books', command=showBooks)
b2.grid(row=5, column=1, sticky=W, padx=38)

mainloop()

```

Output :



b) Design a database application to search the specified record from the database.

Explanation : In following program we have taken one entry box, five radio button in group and one button. On the click of button as per the radio button selected we are searching the attributes of the book. The results are displayed in the list. If no result found it displays the message box. We have used here MySQL like clause to retrieve the results.

Note : To run below example we have used the same database that we have created for example "10) A" above.

Solution :**#10B.py**

```

from tkinter import *
from tkinter import messagebox
import mysql.connector as mysql

def showBooks():
    conn = mysql.connect(user='root', password='root', host='127.0.0.1')
    cursor = conn.cursor()
    cursor.execute("USE Library")
    sql = "SELECT * FROM books where "+var.get()+" like '%" + stext.get() + "%'"
    cursor.execute(sql)
    results = cursor.fetchall()
    if not results:
        messagebox.showinfo(title='Sorry', message="No Record Found!")
    else:

```

```

lbl = Label(win, text= "Search Results")
lbl.grid(row=7, columnspan=2)
listbox = Listbox(win, width=70)
listbox.grid(row=8, columnspan=2)
for row in results: # Iterating and assigning values to list
    listbox.insert(END, row)
conn.commit()# 6: Making the changes permanant in the database

win = Tk()
win.title("Book Search")
var = StringVar()
var.set("title")
Label(win, text="Select the Attribute to Search:").grid(row=0)

r1 = Radiobutton(win, text="Search by Title",width=20, justify="center",
                 variable=var, value="title",anchor="w")
r1.grid(row=1,columnspan=2)
r2 = Radiobutton(win, text="Search by Author",width=20, justify="center",
                 variable=var, value="author",anchor="w")
r2.grid(row=2,columnspan=2)
r3 = Radiobutton(win, text="Search by Pubication", width=20, justify="center",
                 variable=var, value="publisher",anchor="w")
r3.grid(row=3,columnspan=2)
r4 = Radiobutton(win, text="Search by Year", width=20, justify="center",
                 variable=var, value="year",anchor="w")
r4.grid(row=4,columnspan=2)

l1=Label(win, text="Enter the text string to Search:")
l1.grid(row=5,column=0)

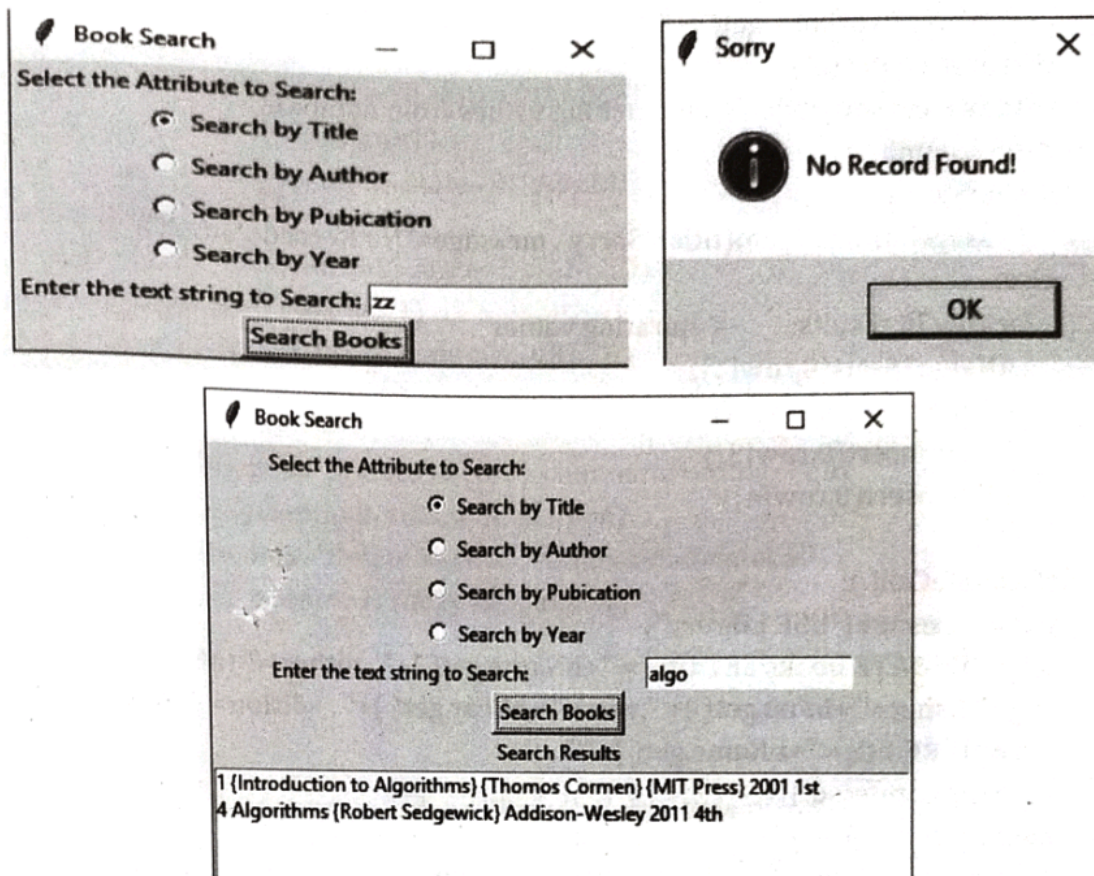
stext = Entry(win, width=20)
stext.grid(row=5,column=1)

b1=Button(win, text='Search Books', command=showBooks)
      .grid(row=6,columnspan=2)

mainloop()

```

Output :



- c) Design a database application to that allows the user to add, delete and modify the records.

Explanation : In following program we used a text entry to first retrieve the record for update. Once we have displayed the records by using `callvalues()` method. After editing the information user can click Update Record button to make the changes in database by using `updateCall()` method. Also for deletion of a data entry user have to click Delete Record button by using `deleteCall()` method. If the particular record for updating or deleting is not found then user is notified with the message.

Solution :

#10C.py

```

from tkinter import *
from tkinter import messagebox
import mysql.connector as mysql

# Creating connection object and selecting current database to use.
conn = mysql.connect(user='root', password='root', host='127.0.0.1')
cursor = conn.cursor( )

def callValues( ):
    bName.config(state=NORMAL) # Enabling text box
    aName.config(state=NORMAL) # Enabling text box
    bPub.config(state=NORMAL) # Enabling text box
    bYear.config(state=NORMAL) # Enabling text box
    bEdi.config(state=NORMAL) # Enabling text box
    cursor.execute("USE Library")

```

```

sql = "SELECT title,author,publisher,year,edition FROM books WHERE
      title='"+bName.get()+"'"
cursor.execute(sql)
results = cursor.fetchall() # Fetching values from database
conn.commit()
if not results:
    messagebox.showinfo(title='Sorry', message="No Record Found!")
else:
    for row in results:      # Iterating values
        aName.insert(0,row[1])
        bPub.insert(0,row[2])
        bYear.insert(0,row[3])
        bEdi.insert(0,row[4])

def updateCall():
    cursor.execute("USE Library")
    sql = "UPDATE books SET title='"+bName.get()+"',author='"+aName.get()+"',
          publisher='"+bPub.get()+"',year="+ bYear.get()+" , edition='"+bEdi.get()+"'
          WHERE title='"+bName.get()+"'"
    cursor.execute(sql)
    conn.commit()
    messagebox.showinfo(title='Confirmation', message="Information Updated")
    bName.delete(0,END) # Clearing text box
    aName.delete(0,END) # Clearing text box
    bPub.delete(0,END) # Clearing text box
    bYear.delete(0,END) # Clearing text box
    bEdi.delete(0,END) # Clearing text box

def deleteCall():
    cursor.execute("USE Library")
    sql = "DELETE FROM books where title='"+bName.get()+"'"
    cursor.execute(sql)
    conn.commit()
    messagebox.showinfo(title='Confirmation', message="Information Deleted")

win = Tk()
win.title("Book Updation Form")

Label(win, text="Enter Book Name").grid(row=0)
bName = Entry(win,width=35)
bName.grid(row=0, column=1)

b1=Button(win, text='Click here to get values', command=callValues)
b1.grid(row=1, sticky=N, pady=4,columnspan=2)

Label(win, text="Author").grid(row=2)
Label(win, text="Publication").grid(row=3)

```

```

Label(win, text="Year").grid(row=4)
Label(win, text="Edition").grid(row=5)

aName = Entry(win,width=35,state=DISABLED)
aName.grid(row=2, column=1)
bPub = Entry(win,width=35,state=DISABLED)
bPub.grid(row=3, column=1)
bYear = Entry(win,width=35,state=DISABLED)
bYear.grid(row=4, column=1)
bEdi = Entry(win,width=35,state=DISABLED)
bEdi.grid(row=5, column=1)

b2=Button(win, text='Update Record', command=updateCall)
b2.grid(row=6, column=0, sticky=N, pady=4)
b3=Button(win, text='Delete Record', command=deleteCall)
b3.grid(row=6, column=1, sticky=N, pady=4)

mainloop()
    
```

Output :

