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FCS2122007

PYTHON JOURNAL

SIES College of Arts, Science & Commerce
RISE WITH EDUCATION
NAAC REACCREDITED - 'A' GRADE
ISO 9001 : 2008

S.I.E.S College of Arts, Science and Commerce
Sion(W), Mumbai – 400 022.

CERTIFICATE

This is to certify that **Mr.** / Miss. **Ansari Saad Ahmed** Roll No. **FCS2122007** Has successfully completed the necessary course of experiments in the subject of **Python Programming-II**
during the academic year **2021 – 2022**complying with the requirements of **University of Mumbai**, for the course of **F.Y.BSc. Computer Science [Semester-2]**

Prof. In-Charge
Mrs. Maya Nair
(Python Programming-II)

Examination Date:
Examiner's Signature & Date:

Head of the Department
Prof. Manoj Singh

College Seal
And
Date

Practical No	Aim
1	File Handling
2	Exception handling in python
3	Iterators and Iterables
4	Regular Expressions
5	GUI Programs
6	Database Applications
7	Socket Programming

File Handling

1) Write a python program to input a file nums.txtwith some numbers ănd create a file results.txt which contains the sum,mean and square-sum of numbers in the input file.

```python
with open("nums.txt","r") as file1:
    numlist=[]
    for i in file1:
        numlist.append(int(i))
sumlist=sum(numlist)
meanlist=sumlist/len(numlist)
sumsq=0
for item in numlist:
    sumsq+=item**2
print(sumlist,meanlist,sumsq)
with open("results.txt","w") as file2:
    file2.write("Sum : "+str(sumlist)+"\n")
    file2.write("Mean :"+str(meanlist)+"\n")
    file2.write("Square sum :"+str(sumsq)+"\n")
```

[4] ✓ 0.2s Python

```
15 3.0 55
```

Txt > nums.txt

```
1
2
3
4
5
```

Txt > results.txt

```
Sum : 15
Mean :3.0
Square sum :55
```

2)Write a python program to input a file emp.txt with data empname,empid and basicpay of n employees. Create a file Payslip.tXt which contains empid,basic pay,da,hra ,ta and netsalary. (da=85% of basicpay,hra= 50% of basicpay ,ta=12% of basicpay,netsalary=basicpay+da+hra+ta

```
empid=[]
empname=[]
basic=[]
netsalary=[]
with open("emp.txt") as file1:
    for line in file1:
        eid,ename,b,=line.split()
        empid.append(eid)
        empname.append(ename)
        basic.append(int(b))
print("Employee Id")
for i in empid:
    print(i)
print("Employee Names")
for i in empname:
    print(i)
print("Basic Salary")
for i in basic:
    print(i)
    da=0.85*i
    hra=0.5*i
    ta=0.12*i
    ns=i+da+hra+ta
    netsalary.append(ns)
with open("Payslip.txt","w") as file1:
    for i in range(0,len(empid)):
        x=str(empid[i])+" "+str(netsalary[i])+"\n"
        file1.write(x)
```

[5] ✓ 0.2s

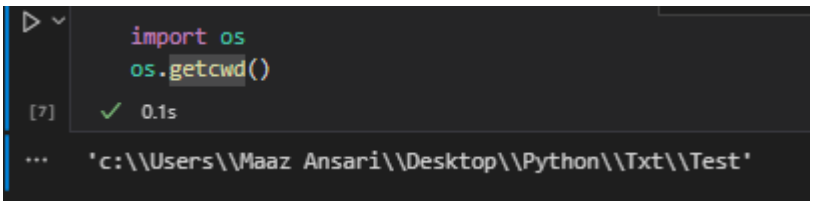
```
Employee Id
E001
E002
E003
E004
Employee Names
MAX
AMY
BOB
ALEX
Basic Salary
20000
30000
35000
25000
```

Txt > Payslip.txt

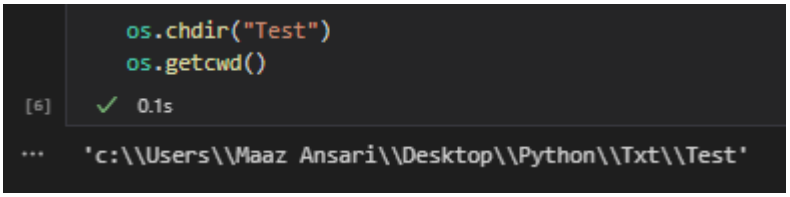
```
1  E001 49400.0
2  E002 74100.0
3  E003 86450.0
4  E004 61750.0
```

3.Use of Directory and file handling functions All Directory and file functions are available in Module named as os. We should import the os Module before calling the functions.

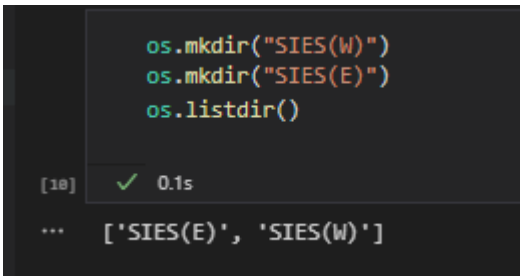
Os.getcwd()-returns current working directory.



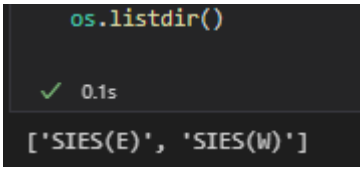
Os.chdir()- to change current directory.



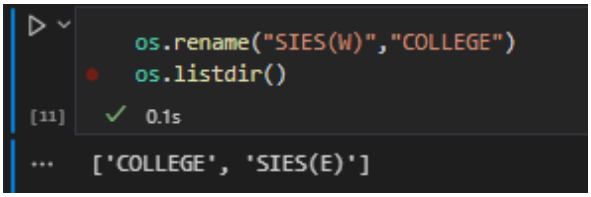
Os.mkdir()- to create new directory.



Os.listdir()- lists all files and directories in current directory.



Os.rename()- to change name of an existing directory.



Os.rmdir()- to remove a directory(only if empty).

```
os.rmdir('COLLEGE')
os.listdir()
```

[13] ✓ 0.1s

```
['SIES(E)']
```

Os.remove()- to remove a file

```
os.remove('test.txt')
os.listdir()
```

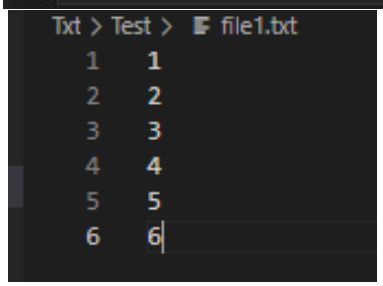
[24] ✓ 0.1s

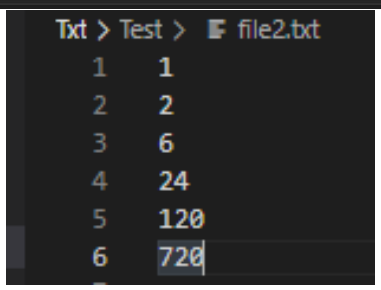
```
[]
```

4)Write a program to read numbers from a file file1 and perform the factorial of Each number and Store into file2

```
fact = 1
with open("file1.txt","r") as file1,open("file2.txt","w") as file2:
    for i in file1:
        fact = fact*int(i)
        file2.write(str(fact)+"\n")
```

[31] ✓ 0.1s





Exception handling in python

1.Write a program to catch ZeroDivisionError ,NameError and ValueError in a set of code

```
try:
    x = input("Enter a number : ")
    y = input("Enter a number : ")
    x = int(x)
    y = int(y)
    z = t/y
    print(f"Quoient of {x} and {y} is {z}")
except ZeroDivisionError:
    print("Zero in denominator is invalid")
except ValueError:
    print("Improper argument")
except NameError:
    print("Variable not defined ")
else:
    print("No exception ")
finally:
    print("Exception handling is done here ")
```

[32] ✓ 13.6s

```
Variable not defined
Exception handling is done here
```

```
Improper argument
Exception handling is done here
```

```
Zero in denominator is invalid
Exception handling is done here
```

```
Quoient of 6 and 3 is 2.0
No exception
Exception handling is done here
```

Iterators and Iterables

1. Write a program to implement traversing through a list using infinite while loop

Using iterators

```
l= [1,2,7,8,9]
list_iter = iter(1)
while True:
    try:
        x = next(list_iter)
        print(x)
    except StopIteration:
        break
```

[50] ✓ 0.1s

```
1
2
7
8
9
```

2. Create a user defined iterable class PowTwo which on iteration gives powers of

Two like 1,2,4,8,16….(By using__ iter_ () and_ next_ () functions with in the

Class definition)

```
class PowTwo:
    def __init__(self,max=0):
        self.max = max
    def __iter__(self,max=0):
        self.n = 0
        return self
    def __next__(self):
        if self.n < self.max:
            result = 2**self.n
            self.n +=1
            return result
        else:
            raise StopIteration
a = PowTwo(6)
aiter = iter (a)
while True:
    try:
        x = next(aiter)
        print(x)
    except StopIteration:
        break
```

[51] ✓ 0.4s

```
1
2
4
8
16
32
```

Regular Expressions

1. Write a python program accept from user following information and Validate as per the Constraints using regular expressions

1.1 Username-Starts with an alphabet and can contain a Minimum 8 characters and maximum Characters of Alphanumeric characters

1.2Mobile number- Contains 10 digits

1.3Email id- starts with lower case alphabet followed by any Number of lower case alphanumericCharcters or "." Charcater Followed by @ symbol followed by lower case alphanumeric Characters and then end with ".com".

```
import re
x = input ("Enter user name : ")
y = input ("Enter mobile number : ")
z = input ("Enter email : ")

if re.match(r"[A-Za-z]\w{7,14}$",x):
    print("Valid username")
else:
    print("Invalid Username")

if re.match(r"\d{10}$",y):
    print("Valid number")
else:
    print("Invalid number")

if  re.match(r"[a-z][a-z0-9._]*@[a-z0-9]+[.]",z):
    print("valid email")
else:
    print("Invalid email")
```

[60] ✓ 22.9s

```
Valid username
Valid number
valid email
```

2. Write a Python function text_match() that matches a string that has an ‘a’ followed by zero or More occurrences of anything, ending in ‘b’. Pattern=r’a.*b$’

```
import re
def text_match(str):
    if re.match(r"a.*b$",str):
        res = f"the string{str} contains the pattern"
    else:
        res = f"the string {str} does not contains the pattern"
    return res
str = input ("Enter the string: ")
x = text_match(str)
print(x)
```

```
[65] ✓ 5.7s
```

```
... the stringamber@123b contains the pattern
```

3. Write a Python function text_match() that matches a string that has an ‘a’ followed by zero or More occurrences of ‘b’. Pattern=r’ab*’

```
import re
def text_match(str):
    if re.match(r"ab*",str):
        res = f"the string {str} contains the pattern"
    else:
        res = f"the string {str} does not contains the pattern"
    return res
str = input ("Enter the string: ")
x = text_match(str)
print(x)
```

```
[68] ✓ 2.1s
```

```
... the stringanger contains the pattern
```

4. Write a python program to accept an address and replace occurrences Of Road by Rd., District By Dst. And Street by St. e.g: ABC Road,XYZ District, RST State→ ABC Rd. , XYZ Dst., RST St.

```
import re
str = input ("Enter the address: ")
str = re.sub(r"[Rr]oad","Rd.",str)
print(str)
str = re.sub(r"[Ss]treet","St.",str)
print (str)
str = re.sub(r"[Dd]istrict","Dst.",str)
print(str)
```

```
[69]  ✓ 33.8s
```

```
Abc Rd., Xyz street,Pqr district
Abc Rd., Xyz St.,Pqr district
Abc Rd., Xyz St.,Pqr Dst.
```

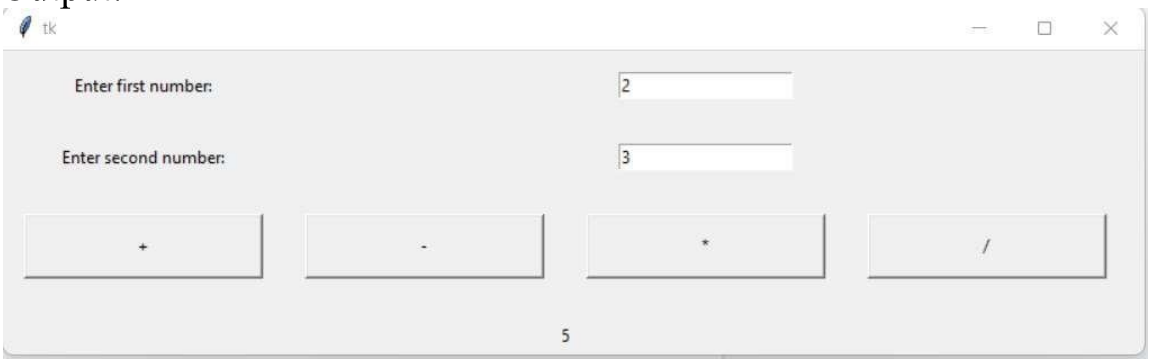
GUI Programs

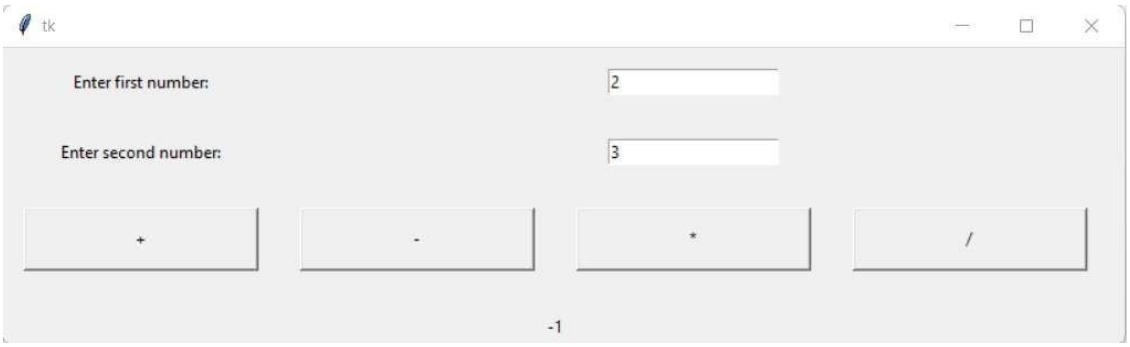
1)Write a GUI python program to accept two numbers and find sum, difference, product and quotient using different buttons.

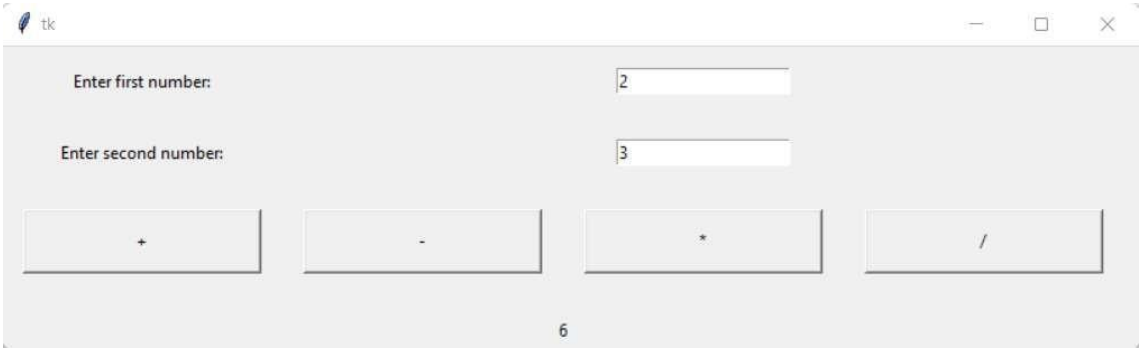
Code:

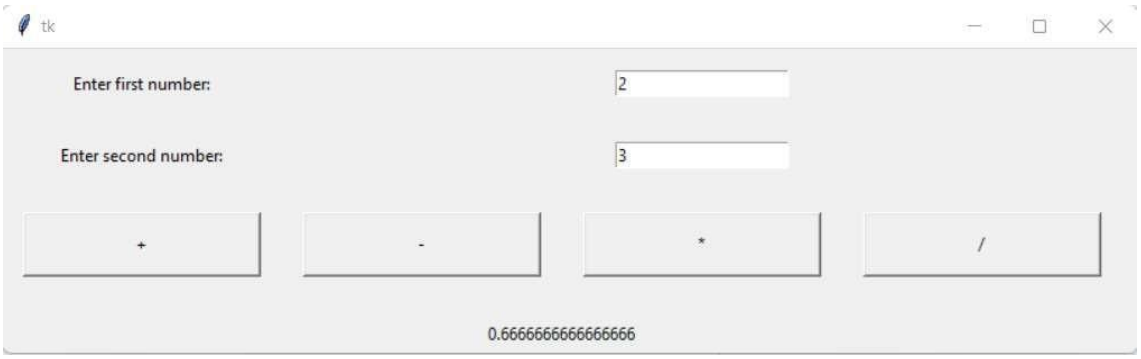
```
from tkinter import*
root=Tk()
def click(s):
    if s=="+":
        x.set(int(e1.get())+int(e2.get()))
    elif s=="-":
        x.set(int(e1.get())-int(e2.get()))
    elif s=="*":
        x.set(int(e1.get())*int(e2.get()))
    else:
        x.set(int(e1.get())/int(e2.get()))

x=IntVar()
l1=Label(root,text="Enter first number:")
l2=Label(root,text="Enter second number:")
e1=Entry(root)
e2=Entry(root)
b1=Button(root,text=" + ",width=20,command=lambda:click("+"))
b2=Button(root,text=" - ",width=20,command=lambda:click("-"))
b3=Button(root,text=" * ",width=20,command=lambda:click("*"))
b4=Button(root,text=" / ",width=20,command=lambda:click("/"))
l3=Label(root,textvariable=x)
l1.grid(row=0,column=0,padx=15,pady=15)
l2.grid(row=1,column=0,padx=15,pady=15)
e1.grid(row=0,column=1,padx=15,pady=15,columnspan=3)
e2.grid(row=1,column=1,padx=15,pady=15,columnspan=3)
b1.grid(row=2,column=0,padx=15,pady=15,ipadx=10,ipady=10)
b2.grid(row=2,column=1,padx=15,pady=15,ipadx=10,ipady=10)
b3.grid(row=2,column=2,padx=15,pady=15,ipadx=10,ipady=10)
b4.grid(row=2,column=3,padx=15,pady=15,ipadx=10,ipady=10)
l3.grid(row=3,column=0,padx=15,pady=15,columnspan=4)
root.mainloop()
```

Output:






tk
Enter first number:
2
Enter second number:
3
+
-
*
/
6

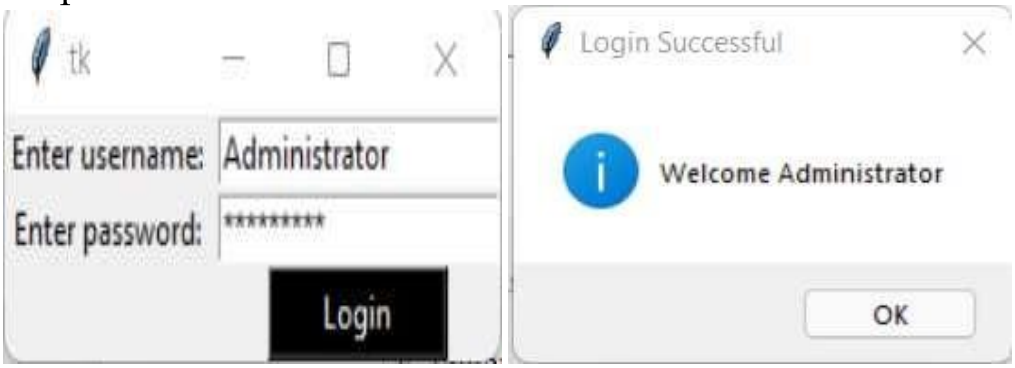

tk
Enter first number:
2
Enter second number:
3
+
-
*
/
0.6666666666666666

2)Write a GUI python program to create a login form that accepts username and password and checks if it is correct as per predefined values, if so, a successful login message is displayed else invalid login message is displayed.

Code:

```
import re
from tkinter import*
from tkinter import messagebox
root=Tk()
root.title("Login Form")
def login():
    u=e1.get()
    p=e2.get()
    if re.match(r'[A-Za-z]\w(7,14)$',u):
        if re.match(r'[a-zA-Z0-9@$#%]{8,}',p):
            if u=="Administrator" and p=="admin@123":
                messagebox.showinfo("Login Successful","Welcome " +u)
            else:
                messagebox.showinfo("Login Unsuccesful","Check your Username and Password")
        else:
            messagebox.showinfo("Login Unsuccesful","Password is not matching with constraints")
    else:
            messagebox.showinfo("Login Unsuccesful","Username is not matching the constraints")
l1=Label(root,text="Username")
l1.grid(row=0)
e1=Entry(root)
e1.grid(row=0,column=1)
l2=Label(root,text="Password")
l2.grid(row=1)
e2=Entry(root,show="*")
e2.grid(row=1,column=1)
b1=Button(root,text="Login",command=login)
b1.grid(row=2,column=1)
root.mainloop()
```

Output:

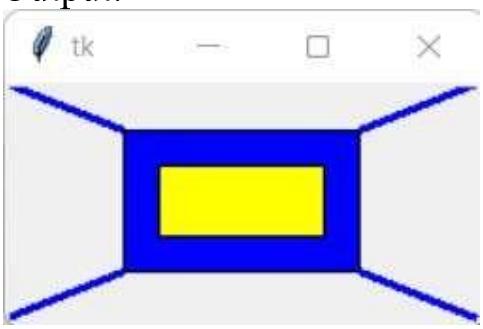


3)Write a python canvas program to implement the below figure:

Code:

```
from tkinter import * #rectangle
root=Tk()
c=Canvas(root,height=100,width=200)#(x1,y1,x2,y2,x3,y3,x4,y4)
c.pack()
c.create_rectangle(50,20,150,80,fill="blue")
c.create_rectangle(65,35,135,65,fill="yellow")
c.pack()
c.create_line(0,0,50,20,width=3,fill="blue")
c.create_line(0,100,50,80,width=3,fill="blue")
c.create_line(150,20,200,0,width=3,fill="blue")
c.create_line(150,80,200,100,width=3,fill="blue")
c.pack()
root.mainloop()
```

Output:

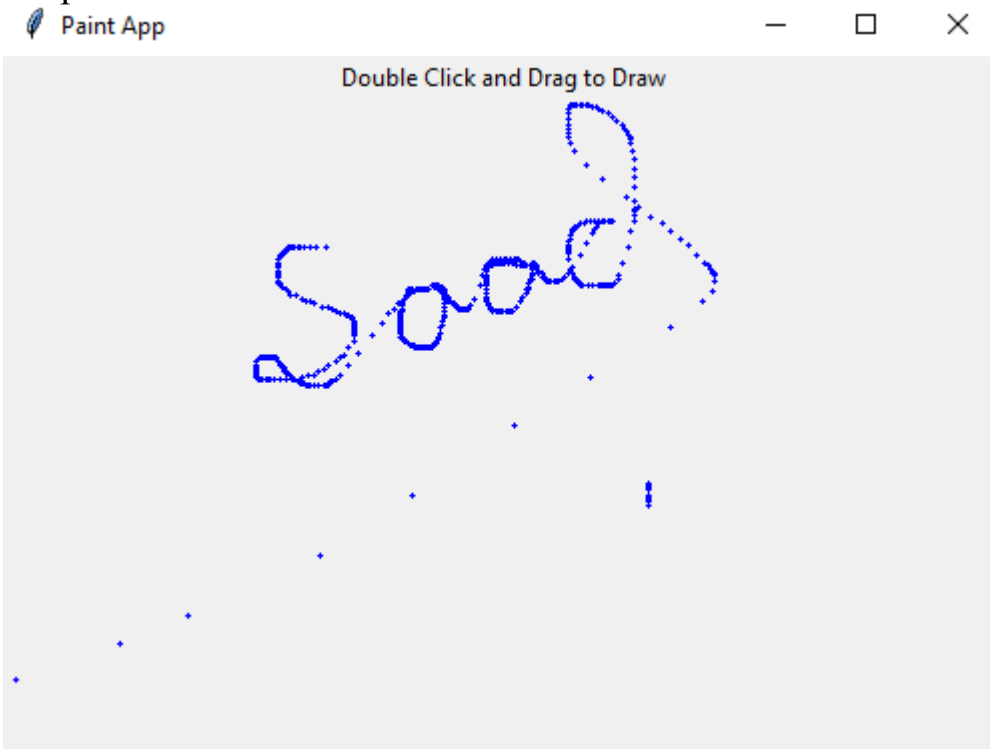


4)Write python Canvas program to implement paint application.

Code:

```
#Practical No 4
from tkinter import*
root = Tk()
#Create Title
root.title("Paint App")
#specify size
root.geometry("500x350")

#define function when
#mouse double click is enabled
def paint( event ):
    #Co-ordinates.
    x1, y1, x2, y2 = ( event.x-1),( event.y-1 ),( event.x + 1 ),( event.y+1 )

    #specify type of display
    #w.create_rectangle(x1,y1,x2,y2,fill = "red")
    w.create_oval(x1,y1,x2,y2,outline="blue",fill="blue")

#create canvas widget.
w = Canvas(root,width = 400, height =250)
#call function when double
#click is enabled.
w.bind( "<B1-Motion>", paint)
#create label.
l = Label( root,text = "Double Click and Drag to Draw")
l.pack()
w.pack(fill=BOTH,expand=1)
mainloop()
```

Output:

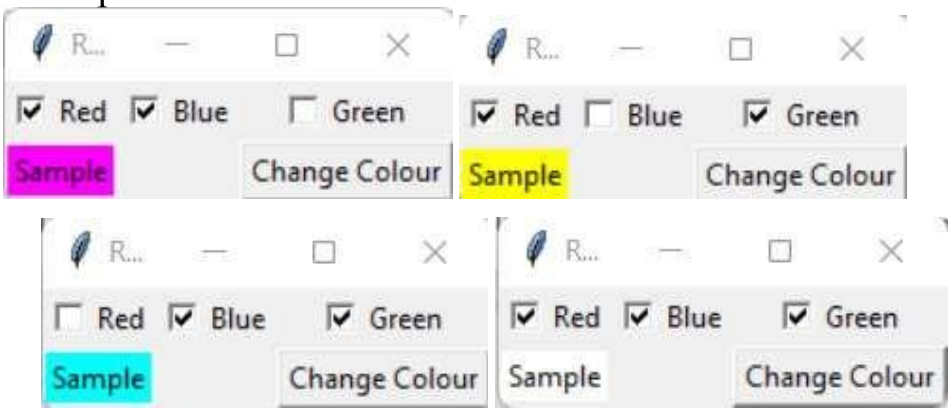


5)Program to use check buttons for representing RGB to set the background colour of a Label (Graphics colours with RGB are represented as a string colour="#(FF|00)(FF|00)(FF|00)" where the first FF or 00 is for Red, second FF or 00 is for green and third FF or 00 is for Blue)

Code:

```
#Program to use check buttons for represting RGB
from tkinter import*
root=Tk()
def update():
    colour="#"
    for i in (r,g,b):
        if i.get():
            colour+="FF"
        else:
            colour+="00"
    l1.configure(bg=colour)
root.title("RGB Checkbutton")
r=IntVar()
b=IntVar()
g=IntVar()
c1=Checkbutton(root, text="Red",variable=r)
c1.grid(row=0)
c2=Checkbutton(root, text="Blue",variable=b)
c2.grid(row=0,column=1)
c3=Checkbutton(root, text="Green",variable=g)
c3.grid(row=0,column=2)
l1=Label(root,text="Sample")
l1.grid(row=1)
b1=Button(root,text="Change Colour",command=update)
b1.grid(row=1,column=2)
root.mainloop()
```

Output:



Database Applications

1. **Write a database program to perform the following**

- **Show all databases in the DBMS.**

```
mycur.execute("SHOW DATABASES")
for i in mycur:
    print(i)
```

✓ 0.1s

```
('information_schema',)
('mysql',)
('performance_schema',)
('phpmyadmin',)
('test',)
```

- **Create a Database named "Company".**

```
mycur.execute("CREATE DATABASE COMPANY")
```

✓ 0.7s

```
mycur.execute("SHOW DATABASES")
for i in mycur:
    print(i)
```

✓ 0.1s

```
('company',)
('information_schema',)
('mysql',)
('performance_schema',)
('phpmyadmin',)
('test',)
```

- **Create a table Employee in Company Database(empid int,empname varchar(50), designation varchar(50),basic int)**

```
mycur.execute("CREATE TABLE EMPLOYEE(empid int,empname varchar(50), designation varchar(50),basic int)")
```

✓ 0.1s

- **Insert 10 records into employee table**

```
rec = "INSERT INTO EMPLOYEE(empid,empname,designation,basic)VALUES(%s,%s,%s,%s)"
val = [(111,"Adrian","Manager",50000),(112,"Bob","CSCP",30000),\
(113,"Alex","CIM",60000),(114,"Ana","CIP",29000),(115,"Julian","CCC",55000),\
(116,"Phil","CFA",35000),(117,"Jones","CPA",40000),(118,"Ishaan","CHRL",45000),\
(119,"Aditi","PMP",60000),(120,"Naina","RP",65000)]
mycur.executemany(rec,val)
con.commit()

✓ 0.1s
```

- **Display all records of employee table**

```
mycur.execute("SELECT * FROM EMPLOYEE")
result = mycur.fetchall()
for x in result:
    print(x)
```

```
(111, 'Adrian', 'Manager', 50000)
(112, 'Bob', 'CSCP', 30000)
(113, 'Alex', 'CIM', 60000)
(114, 'Ana', 'CIP', 29000)
(115, 'Julian', 'CCC', 55000)
(116, 'Phil', 'CFA', 35000)
(117, 'Jones', 'CPA', 40000)
(118, 'Ishaan', 'CHRL', 45000)
(119, 'Aditi', 'PMP', 60000)
(120, 'Naina', 'RP', 65000)
```

- **Display the employees details with designation as entered by the user at runtime**

```
query="SELECT * FROM EMPLOYEE WHERE DESIGNATION=%s"
dsgninput=str(input("Enter Designation"))
dsgn=(dsgninput,)
mycur.execute(query,dsgn)
x=mycur.fetchall()
for i in x:
    print(i)
```

```
(111, 'Adrian', 'Manager', 50000)
```

- **Display the employee details with basic<35000**

```
basic="SELECT * FROM EMPLOYEE WHERE BASIC<35000"
mycur.execute(basic)
x=mycur.fetchall()
for i in x:
    print(i)
```

```
(112, 'Bob', 'CSCP', 30000)
(114, 'Ana', 'CIP', 29000)
```

- **Update the basic of Manager by 30%**

```
Update="UPDATE EMPLOYEE SET BASIC = BASIC*.1+BASIC WHERE DESIGNATION='MANAGER'"
mycur.execute(Update)
con.commit()
```

✓ 0.1s

Output:

EMPID	EMPNAME	DESIGNATION	BASIC
111	Adrian	Manager	55000
112	Bob	CSCP	30000
113	Alex	CIM	60000
114	Ana	CIP	29000
115	Julian	CCC	55000
116	Phil	CFA	35000
117	Jones	CPA	40000
118	Ishaan	CHRL	45000
119	Aditi	PMP	60000
120	Naina	RP	65000

Socket Programming

Echo Client and Echo Server

```
import socket
HOST = '127.0.0.1' # The server's hostname or IP address
PORT = 65432 # The port used by the server
with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as s:
    s.connect((HOST, PORT))
    s.sendall(b'Hello, world')
    data = s.recv(1024)
    print('Received', repr(data))
```

```
Serve Listening at 65432 of 127.0.0.1
```

```
import socket
HOST = '127.0.0.1' # The server's hostname or IP address
PORT = 65432 # The port used by the server
with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as s:
    s.connect((HOST, PORT))
    s.sendall(b'Hello, world')
    data = s.recv(1024)
    print('Received', repr(data))
```

```
Received b'Hello, world'
```