Graphical User Interface (GUI) Development

Python provides various libraries for developing GUI applications or windows based applications.

1. Tkinter
2. Wxpython
3. pyQT
4. kivy

tkinter is a default package which comes with python software. It is a toolkit for developing GUI applications or windows based or desktop applications.

import tkinter

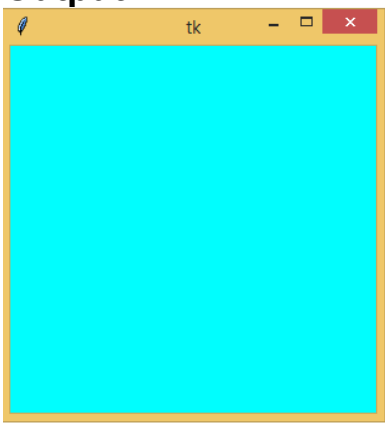
tkinter is a collection of objects. Each object is called widget.

Tk class
Tk class is used for creating window object. It is root widget where all other widgets or component are placed.

Example:

```
import tkinter
def main():
    window=tkinter.Tk()
    window.geometry("300x300")
    window.config(bg="cyan")
main()
```

Output:



Label
Label is called display item (OR) Label is used for displaying text.

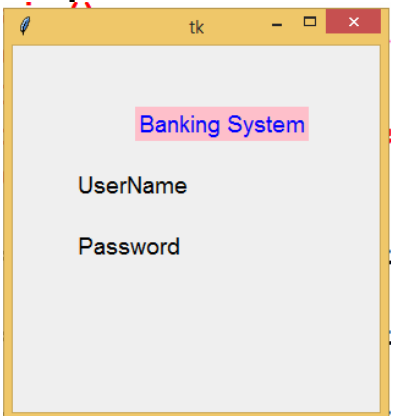
Syntax:
Label(root,text,bg,fg,font)

root → root widget where this label placed
text → message or text displayed on label
bg → background color of the label
fg → foreground color of the label
font → fontname and size

Example:

```
import tkinter
def main():
    window=tkinter.Tk()
    window.geometry("300x300")
    l1=tkinter.Label(window,text="Banking
System",bg="pink",fg="blue",font=("Arial",14))
    l1.place(x=100,y=50)
    l2=tkinter.Label(window,text="UserName",font=("Arial",14))
    l3=tkinter.Label(window,text="Password",font=("Arial",14))
    l2.place(x=50,y=100)
    l3.place(x=50,y=150)
main()
```

Output:

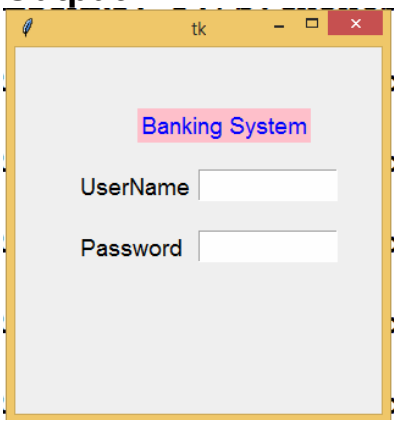


Entry widget
Entry widget is input field, where end user can input values.

Syntax:
Entry(window,width,bg,fg,font,show)

```
import tkinter
def main():
    window=tkinter.Tk()
    window.geometry("300x300")
    l1=tkinter.Label(window,text="Banking
System",bg="pink",fg="blue",font=("Arial",14))
    l1.place(x=100,y=50)
    l2=tkinter.Label(window,text="UserName",font=("Arial",14))
    l3=tkinter.Label(window,text="Password",font=("Arial",14))
    l2.place(x=50,y=100)
    l3.place(x=50,y=150)
    e1=tkinter.Entry(window,width=10,font=("Arial",14))
    e2=tkinter.Entry(window,width=10,font=("Arial",14),show="*")
    e1.place(x=150,y=100)
    e2.place(x=150,y=150)
main()
```

Output:



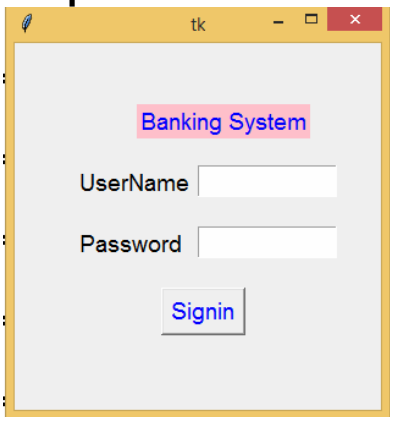
Button widget
This widget is used for executing commands or functions.

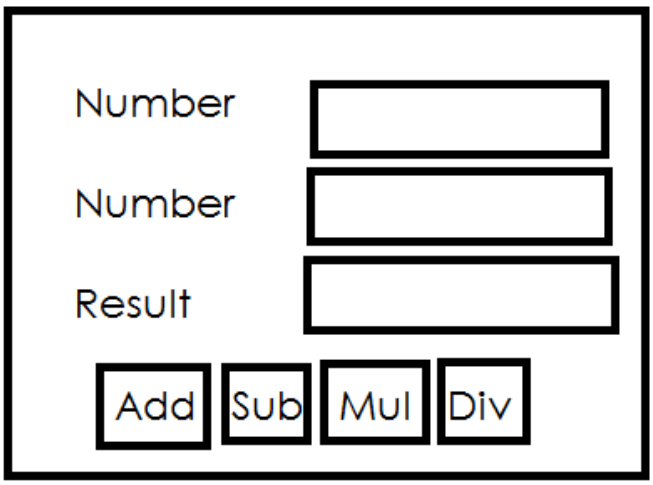
Syntax:
Button(root,text,bg,fg,font)

Example:

```
import tkinter
def main():
    window=tkinter.Tk()
    window.geometry("300x300")
    l1=tkinter.Label(window,text="Banking
System",bg="pink",fg="blue",font=("Arial",14))
    l1.place(x=100,y=50)
    l2=tkinter.Label(window,text="UserName",font=("Arial",14))
    l3=tkinter.Label(window,text="Password",font=("Arial",14))
    l2.place(x=50,y=100)
    l3.place(x=50,y=150)
    e1=tkinter.Entry(window,width=10,font=("Arial",14))
    e2=tkinter.Entry(window,width=10,font=("Arial",14),show="*")
    e1.place(x=150,y=100)
    e2.place(x=150,y=150)
    b1=tkinter.Button(window,text="Signin",fg="blue",font=("Arial",14))
    b1.place(x=120,y=200)
main()
```

Output:



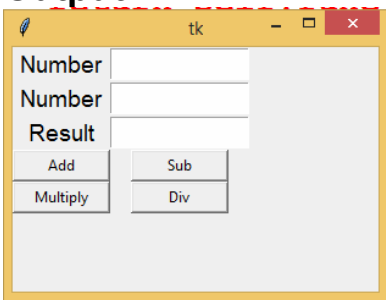


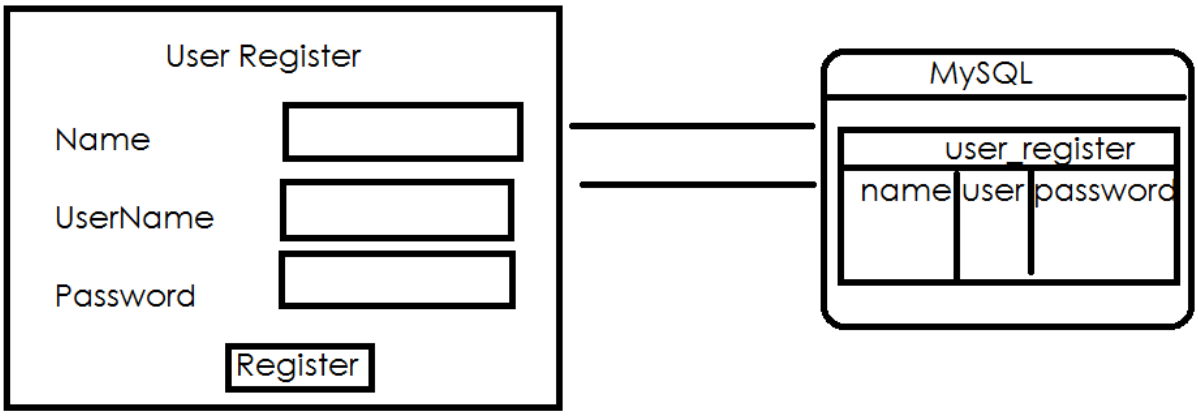
Example:

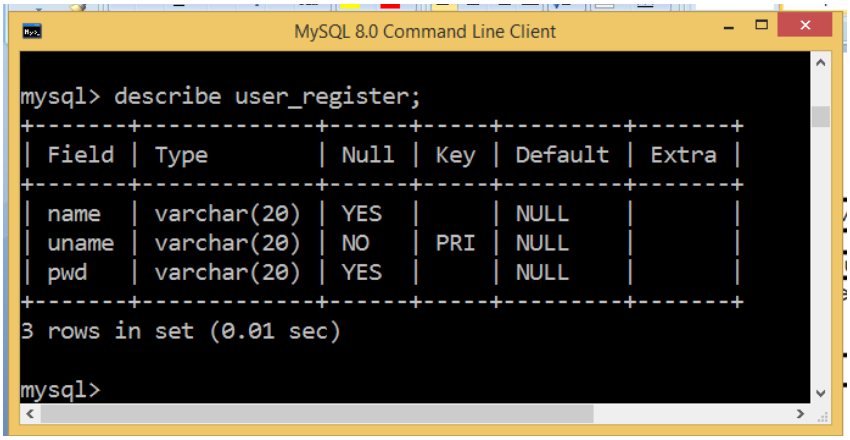
```
import tkinter

def main():
    window=tkinter.Tk()
    window.geometry("300x200")
    l1=tkinter.Label(window,text="Number",font=("Arial",14))
    l2=tkinter.Label(window,text="Number",font=("Arial",14))
    l3=tkinter.Label(window,text="Result",font=("Arial",14))
    e1=tkinter.Entry(window,width=10,font=("Arial",14))
    e2=tkinter.Entry(window,width=10,font=("Arial",14))
    e3=tkinter.Entry(window,width=10,font=("Arial",14))
    def add():
        n1=int(e1.get())
        n2=int(e2.get())
        n3=n1+n2
        e3.delete(0,tkinter.END)
        e3.insert(0,str(n3))
    def sub():
        n1=int(e1.get())
        n2=int(e2.get())
        n3=n1-n2
        e3.delete(0,tkinter.END)
        e3.insert(0,str(n3))

    def mul():
```

```
        n1=int(e1.get())
        n2=int(e2.get())
        n3=n1*n2
        e3.delete(0,tkinter.END)
        e3.insert(0,str(n3))

    def div():
        n1=int(e1.get())
        n2=int(e2.get())
        n3=n1/n2
        e3.delete(0,tkinter.END)
        e3.insert(0,str(n3))

    b1=tkinter.Button(window,text="Add",width=10,command=add)
    b2=tkinter.Button(window,text="Sub",width=10,command=sub)
    b3=tkinter.Button(window,text="Multiply",width=10,command=mul)
    b4=tkinter.Button(window,text="Div",width=10,command=div)

    l1.grid(row=0,column=0)
    l2.grid(row=1,column=0)
    l3.grid(row=2,column=0)
    e1.grid(row=0,column=1)
    e2.grid(row=1,column=1)
    e3.grid(row=2,column=1)
    b1.grid(row=3,column=0)
    b2.grid(row=3,column=1)
    b3.grid(row=4,column=0)
    b4.grid(row=4,column=1)

main()
```

Output:





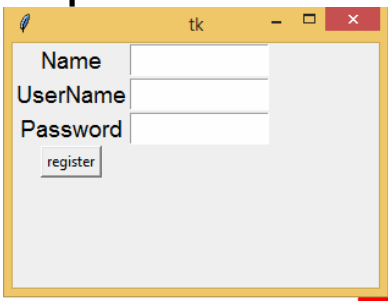


Example:

```
mport tkinter as tk
import mysql.connector as mysql
from tkinter import messagebox
cn=mysql.connect(database="db6pm",user="root",password="root")
def main():

    window=tk.Tk()
    window.geometry("300x200")
    l1=tk.Label(window,text="Name",font=("Arial",14))
    l2=tk.Label(window,text="UserName",font=("Arial",14))
    l3=tk.Label(window,text="Password",font=("Arial",14))
    e1=tk.Entry(window,width=10,font=("Arial",14))
    e2=tk.Entry(window,width=10,font=("Arial",14))
    e3=tk.Entry(window,width=10,font=("Arial",14),show="*")
```

```
    def register():
        c=cn.cursor()
        cmd="insert into user_register values(%s,%s,%s)"
        try:
            c.execute(cmd,params=(e1.get(),e2.get(),e3.get()))
            messagebox.showinfo(message="UserRegistered")
            cn.commit()
            e1.delete(0,tk.END)
            e2.delete(0,tk.END)
            e3.delete(0,tk.END)
        except:
            messagebox.showerror(message="User exists")


    b1=tk.Button(window,text="register",command=register)
    l1.grid(row=0,column=0)
    l2.grid(row=1,column=0)
    l3.grid(row=2,column=0)
    e1.grid(row=0,column=1)
    e2.grid(row=1,column=1)
    e3.grid(row=2,column=1)
    b1.grid(row=3,column=0)

main()
```

Output:



Example:

```
import tkinter
import mysql.connector as mysql
from tkinter import messagebox
cn=mysql.connect(database="db6pm",user="root",password="root")
```

```
def main():
    window=tkinter.Tk()
    window.geometry("300x300")
    l2=tkinter.Label(window,text="UserName",font=("Arial",14))
    l3=tkinter.Label(window,text="Password",font=("Arial",14))
    l2.place(x=50,y=100)
    l3.place(x=50,y=150)
    e1=tkinter.Entry(window,width=10,font=("Arial",14))
    e2=tkinter.Entry(window,width=10,font=("Arial",14),show="*")
    e1.place(x=150,y=100)
    e2.place(x=150,y=150)
    def app():
        w=tkinter.Tk()
        w.geometry("300x300")
    def signin():
        c=cn.cursor()
        cmd="select * from user_register where uname=%s and pwd=%s"
        c.execute(cmd,params=(e1.get(),e2.get()))
        row=c.fetchone()
        if row==None:
            messagebox.showinfo(message="invalid username or password")
        else:
            app()

b1=tkinter.Button(window,text="Signin",fg="blue",font=("Arial",14),comman
d=signin)
    b1.place(x=120,y=200)
main()
```

Output: