from tkinter import \*  
from tkinter.messagebox import \*  
import math as m  
  
  
#some useful variables  
font = ('Verdana', 22,'bold')  
  
#important functions  
  
def clear():  
 ex = textField.get()  
 ex = ex[0:len(ex) - 1]  
 textField.delete(0, END)  
 textField.insert(0, ex)  
  
def all\_clear():  
 textField.delete(0, END)  
  
  
  
  
  
def click\_btn\_function(event):  
 print("btn clicked")  
 b=event.widget  
 text=b['text']  
 print(text)  
  
 if text == '=':  
  
 ex = textField.get()  
 answer = eval(ex)  
 textField.delete(0, END)  
 textField.insert(0, answer)  
 return  
 textField.insert(END, text)  
  
  
#creating a window  
window=Tk()  
window.title('My calculator')  
window.geometry('470x490')  
#picture label  
  
headingLabel = Label(window, text="My Label")  
headingLabel.pack(side=TOP,pady=10)  
  
  
#haeding label  
heading = Label(window, text='My calculator',font=font)  
heading.pack(side=TOP)  
  
#textfield  
textField = Entry(window,font=font,justify=CENTER)  
textField.pack(side=TOP,pady=10,fill=X,padx=10)  
  
#buttons  
buttonFrame = Frame(window)  
buttonFrame.pack(side=TOP)  
  
#adding buttons  
temp = 1  
for i in range(0, 3):  
 for j in range(0, 3):  
 btn = Button(buttonFrame, text=str(temp), font=font, width=5, relief='ridge',activeforeground='white', activebackground='red')  
 btn.grid(row=i, column=j, padx=3, pady=3)  
 temp = temp+1  
 btn.bind('<Button-1>', click\_btn\_function)  
  
zerobtn = Button(buttonFrame, text='0', font=font, width=5, relief='ridge',activeforeground='white', activebackground='red')  
zerobtn.grid(row=3, column=0, padx=3, pady=3)  
  
dotbtn = Button(buttonFrame, text='.', font=font, width=5, relief='ridge',activeforeground='white', activebackground='red')  
dotbtn.grid(row=3, column=1, padx=3, pady=3)  
  
equalbtn = Button(buttonFrame, text='=', font=font, width=5, relief='ridge',activeforeground='white', activebackground='red')  
equalbtn.grid(row=3, column=2, padx=3, pady=3)  
  
plusbtn = Button(buttonFrame, text='+', font=font, width=5, relief='ridge',activeforeground='white', activebackground='red')  
plusbtn.grid(row=0, column=3, padx=3, pady=3)  
  
minusebtn = Button(buttonFrame, text='-', font=font, width=5, relief='ridge',activeforeground='white', activebackground='red')  
minusebtn.grid(row=1, column=3, padx=3, pady=3)  
  
multibtn = Button(buttonFrame, text='\*', font=font, width=5, relief='ridge',activeforeground='white', activebackground='red')  
multibtn.grid(row=2, column=3, padx=3, pady=3)  
  
dividbtn = Button(buttonFrame, text='/', font=font, width=5, relief='ridge',activeforeground='white', activebackground='red')  
dividbtn.grid(row=3, column=3, padx=3, pady=3)  
  
clearbtn = Button(buttonFrame, text='<--', font=font, width=11, relief='ridge', command=clear, activeforeground='white', activebackground='red')  
clearbtn.grid(row=4, column=0, columnspan=2, padx=3, pady=3)  
  
allclearbtn = Button(buttonFrame, text='AC', font=font, width=11, relief='ridge', command=all\_clear, activeforeground='white', activebackground='red')  
allclearbtn.grid(row=4, column=2, columnspan=2, padx=3, pady=3)  
  
  
#binding all buttons  
plusbtn.bind('<Button-1>', click\_btn\_function)  
minusebtn.bind('<Button-1>', click\_btn\_function)  
multibtn.bind('<Button-1>', click\_btn\_function)  
dividbtn.bind('<Button-1>', click\_btn\_function)  
equalbtn.bind('<Button-1>', click\_btn\_function)  
zerobtn.bind('<Button-1>', click\_btn\_function)  
dotbtn.bind('<Button-1>', click\_btn\_function)  
  
  
  
#####  
# Scientific function  
scFrame=Frame(window)  
  
sqrtbtn = Button(scFrame, text='√', font=font, width=5, relief='ridge', activeforeground='white', activebackground='red')  
sqrtbtn.grid(row=0, column=0, padx=3, pady=3)  
  
powbtn = Button(scFrame, text='^', font=font, width=5, relief='ridge', activeforeground='white', activebackground='red')  
powbtn.grid(row=0, column=1, padx=3, pady=3)  
  
factbtn = Button(scFrame, text='x!', font=font, width=5, relief='ridge', activeforeground='white', activebackground='red')  
factbtn.grid(row=0, column=2, padx=3, pady=3)  
  
radbtn = Button(scFrame, text='toRad', font=font, width=5, relief='ridge', activeforeground='white', activebackground='red')  
radbtn.grid(row=0, column=3, padx=3, pady=3)  
  
degbtn = Button(scFrame, text='toDeg', font=font, width=5, relief='ridge', activeforeground='white', activebackground='red')  
degbtn.grid(row=1, column=0, padx=3, pady=3)  
  
sinbtn = Button(scFrame, text='sinΘ', font=font, width=5, relief='ridge', activeforeground='white', activebackground='red')  
sinbtn.grid(row=1, column=1, padx=3, pady=3)  
  
cosbtn = Button(scFrame, text='cosΘ', font=font, width=5, relief='ridge', activeforeground='white', activebackground='red')  
cosbtn.grid(row=1, column=2, padx=3, pady=3)  
  
tanbtn = Button(scFrame, text='tanΘ', font=font, width=5, relief='ridge', activeforeground='white', activebackground='red')  
tanbtn.grid(row=1, column=3, padx=3, pady=3)  
  
  
normalcalc = True  
  
  
  
def calculate\_sc(event):  
 print('btn..')  
 btn = event.widget  
 text = btn['text']  
 print(text)  
 ex=textField.get()  
 answer = ''  
 if text == 'toDeg':  
 print("cal degree")  
 answer = str(m.degrees(float(ex)))  
  
 textField.insert(0, answer)  
  
  
  
 elif text == 'toRed':  
 print('radian')  
 answer = str(m.radians(float(ex)))  
  
 elif text == 'x!':  
 print("cal factorial")  
 answer=str(m.factorial(int(ex)))  
 textField.delete(0, END)  
 textField.insert(0, answer)  
  
 elif text == 'sinΘ':  
 print("cal sinΘ")  
 answer = str(m.sin(m.radians(int(ex))))  
 textField.delete(0, END)  
 textField.insert(0, answer)  
  
 elif text == 'cosΘ':  
 print('cal cosΘ')  
 answer = str(m.cos(m.radians(int(ex))))  
 textField.delete(0, END)  
 textField.insert(0, answer)  
  
 elif text == 'tanΘ':  
 print('caltanΘ')  
 answer = str(m.tan(m.radians(int(ex))))  
 textField.delete(0, END)  
 textField.insert(0, answer)  
  
 elif text == '√':  
 print('sqrt')  
 answer = m.sqrt(int(ex))  
 textField.delete(0, END)  
 textField.insert(0, answer)  
  
 elif text == '^':  
 print('pow')  
 base, pow = ex.split(',')  
 print(base)  
 print(pow)  
 answer = ''  
 answer = m.pow(int(base), int(pow))  
  
 textField.delete(0, END)  
 textField.insert(0, answer)  
  
  
  
  
  
  
def sc\_click():  
 global normalcalc  
 if normalcalc:  
 #scientific.....  
 buttonFrame.pack\_forget()  
 #add scientific Frame  
 scFrame.pack(side=TOP)  
 buttonFrame.pack(side=TOP)  
 window.geometry('470x700')  
 print("show sc")  
 normalcalc= False  
 else:  
 print('show normal')  
 scFrame.pack\_forget()  
 window.geometry('470x490')  
 normalcalc = True  
  
  
  
fontMenu = ('', 15)  
menubar = Menu(window,font=fontMenu)  
  
mode = Menu(menubar, font=fontMenu, tearoff=0)  
mode.add\_checkbutton(label="Scientific Calculator",command=sc\_click)  
  
menubar.add\_cascade(label="Mode", menu=mode)  
  
window.config(menu=menubar)  
  
#binding scientific buttons  
sqrtbtn.bind("<Button-1>", calculate\_sc)  
powbtn.bind("<Button-1>", calculate\_sc)  
factbtn.bind("<Button-1>", calculate\_sc)  
radbtn.bind("<Button-1>", calculate\_sc)  
degbtn.bind("<Button-1>", calculate\_sc)  
sinbtn.bind("<Button-1>", calculate\_sc)  
cosbtn.bind("<Button-1>", calculate\_sc)  
tanbtn.bind("<Button-1>", calculate\_sc)  
  
window.mainloop()