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TP5 Interfaces graphiques

Objectif : Créer une calculatrice qui permet de réaliser les opérations : +, -, *, /, sin, cos, π, x^2, et $\sqrt{x}$.

Code :

```
from tkinter import *
from math import *

class Fenetre(Tk):
    def __init__(self):
        Tk.__init__(self)

        #centrer la fenetre sur l'écran
        ecran_x = self.winfo_screenwidth()
        ecran_y = self.winfo_screenheight()
        fenetre_x = 400
        fenetre_y = 300
        pos_x = ecran_x // 2 - fenetre_x // 2
        pos_y = ecran_y // 2 - fenetre_y // 2
        geometrie = f"{fenetre_x}x{fenetre_y}+{pos_x}+{pos_y}"
        self.geometry(geometrie)

        #attributs de la calculatrice
        self.entry = StringVar()
        self.entry.set("")
        Label(self, width=23, justify = "left", textvariable=self.entry,
bg="black", fg="white", relief=SUNKEN, bd=5, anchor='w').place(x=9, y=8)
        self.calcul = ""
        self.text= ""
        self.title("Calculatrice")
        self.historique="Voici l'historique des calculs : \n"
        self.create_boutons()


    def create_boutons(self):
        self.__B0 = Button(self, text="0", command=self.Button0, width=3,
height=2, bg="gold", fg="black", relief=RAISED, bd=3).place(x=50, y=190)
# Boutton 0
        self.__B1 = Button(self, text="1", command=self.Button1, width=3,
height=2, bg="gold", fg="black", relief=RAISED, bd=3).place(x=10,y=40)
# Boutton 1
        self.__B2 = Button(self, text="2", command=self.Button2, width=3,
height=2, bg="gold", fg="black", relief=RAISED, bd=3).place(x=50,y=40)
# Boutton 2
        self.__B3 = Button(self, text="3", command=self.Button3, width=3,
height=2, bg="gold", fg="black", relief=RAISED, bd=3).place(x=90, y=40)
# Boutton 3
        self.__B4 = Button(self, text="4", command=self.Button4, width=3,
height=2, bg="gold", fg="black", relief=RAISED, bd=3).place(x=10, y=90)
# Boutton 4
        self.__B5 = Button(self, text="5", command=self.Button5, width=3,
height=2, bg="gold", fg="black", relief=RAISED, bd=3).place(x=50, y=90)
# Boutton 5
        self.__B6 = Button(self, text="6", command=self.Button6, width=3,
height=2, bg="gold", fg="black", relief=RAISED, bd=3).place(x=90, y=90)
# Boutton 6
        self.__B7 = Button(self, text="7", command=self.Button7, width=3,
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height=2, bg="gold", fg="black", relief=RAISED, bd=3).place(x=10, y=140)
# Boutton 7
        self.__B8 = Button(self, text="8", command=self.Button8, width=3,
height=2, bg="gold", fg="black", relief=RAISED, bd=3).place(x=50, y=140)
# Boutton 8
        self.__B9 = Button(self, text="9", command=self.Button9, width=3,
height=2, bg="gold", fg="black", relief=RAISED, bd=3).place(x=90, y=140)
# Boutton 9

        self.__BC = Button(self, text="Clear all", command=self.ButtonC,
width=6, height=1, bg="green", fg="black", relief=RIDGE,
bd=3).place(x=130,y=310)  # Boutton C (Clear)
        self.__BH = Button(self, text="Historique", command=self.ButtonH,
width=8, height=1, bg="red", fg="black",  relief=RIDGE, bd=3).place(x=120,
y=365)  # Boutton Historique

        self.__BF = Button(self, text=".", command=self.ButtonF, width=3,
height=2, bg="gold", fg="black", relief=RAISED, bd=3).place(x=90, y=190)  #
Boutton = (fraction)
        self.__BP = Button(self, text="+", command=self.ButtonP, width=3,
height=2, bg="cyan", fg="black", relief=SUNKEN, bd=3).place(x=150, y=40)  #
Boutton + (addition)
        self.__BS = Button(self, text="-", command=self.ButtonS, width=3,
height=2, bg="cyan", fg="black", relief=SUNKEN, bd=3).place(x=150, y=90)  #
Boutton - (soustraction)
        self.__BD = Button(self, text="/", command=self.ButtonD, width=3,
height=2, bg="cyan", fg="black", relief=SUNKEN, bd=3).place(x=150, y=190)
# Boutton / (division)
        self.__BM = Button(self, text="x", command=self.ButtonM, width=3,
height=2, bg="cyan", fg="black", relief=SUNKEN, bd=3).place(x=150, y=140)
# Boutton X (multiplication)
        self.__B_par_ouvr = Button(self, text="(",
command=self.Button_parent_ouvr, width=6, height=1, bg="cyan", fg="black",
relief=SUNKEN, bd=3).place(x=10, y=310)  # Boutton (
        self.__B_par_ferm = Button(self, text=")",
command=self.Button_parent_ferm, width=6, height=1, bg="cyan",  fg="black",
relief=SUNKEN, bd=3).place(x=70, y=310)  # Boutton )
        self.__BE = Button(self, text="=", command=self.ButtonE, width=3,
height=2, bg="red", fg="black", relief=RIDGE, bd=3).place(x=10, y=190)  #
Button = (égale)
        self.__B_sin=Button(self, text="sin", command=self.Button_sin,
width=6, height=1, bg="cyan", fg="black", relief=SUNKEN, bd=3).place(x=70,
y=250)  # Button = (sin)
        self.__B_cos = Button(self, text="cos", command=self.Button_cos,
width=6, height=1, bg="cyan", fg="black",relief=SUNKEN, bd=3).place(x=10,
y=250)  # Button = (cos)
        self.__B_tan = Button(self, text="tan", command=self.Button_tan,
width=6, height=1, bg="cyan", fg="black",relief=SUNKEN, bd=3).place(x=130,
y=250) # Button = (tan)
        self.__B_pi = Button(self, text="π", command=self.Button_pi,
width=6, height=1, bg="cyan", fg="black",relief=SUNKEN, bd=3).place(x=10,
y=280) # Button = (π)
        self.__B_sqr = Button(self, text="x²", command=self.Button_sqr,
width=6, height=1, bg="cyan", fg="black",relief=SUNKEN, bd=3).place(x=70,
y=280) # Button = (x²)
        self.__B_sqrt = Button(self, text=" √x", command=self.Button_sqrt,
width=6, height=1, bg="cyan", fg="black",relief=SUNKEN, bd=3).place(x=130,
y=280) # Button = (√x)

    def Button1(self):  # Actionnerle bouton 1
        self.calcul += "1"
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        self.text += "1"
        self.entry.set(self.text)
    def Button2(self):  # Actionnerle bouton 2
        self.calcul += "2"
        self.text += "2"
        self.entry.set(self.text)
    def Button3(self):  # Actionnerle bouton 3
        self.calcul += "3"
        self.text += "3"
        self.entry.set(self.text)
    def Button4(self):  # Actionnerle bouton 4
        self.calcul += "4"
        self.text += "4"
        self.entry.set(self.text)
    def Button5(self):  # Actionnerle bouton 5
        self.calcul += "5"
        self.text += "5"
        self.entry.set(self.text)
    def Button6(self):  # Actionnerle bouton 6
        self.calcul += "6"
        self.text += "6"
        self.entry.set(self.text)
    def Button7(self):  # Actionnerle bouton 7
        self.calcul += "7"
        self.text += "7"
        self.entry.set(self.text)
    def Button8(self):  # Actionnerle bouton 8
        self.calcul += "8"
        self.text += "8"
        self.entry.set(self.text)
    def Button9(self):  # Actionnerle bouton 9
        self.calcul += "9"
        self.text += "9"
        self.entry.set(self.text)
    def Button0(self):  # Actionnerle bouton 0
        self.calcul += "0"
        self.text += "0"
        self.entry.set(self.text)
    def ButtonF(self):  # Actionnerle bouton F
        self.calcul += "."
        self.text += "."
        self.entry.set(self.text)
    def ButtonP(self):  # Actionnerle bouton P
        self.calcul += "+"
        self.text += "+"
        self.entry.set(self.text)
    def ButtonS(self):  # Actionnerle bouton S
        self.calcul += "-"
        self.text += "-"
        self.entry.set(self.text)
    def ButtonD(self):  # Actionnerle bouton D
        self.calcul += "/"
        self.text += "/"
        self.entry.set(self.text)
    def ButtonM(self):  # Actionnerle bouton M
        self.calcul += '*'
        self.text += "x"
        self.entry.set(self.text)
    def ButtonE(self):  # Actionnerle bouton E
        self.operation()
    def ButtonC(self):  # Actionnerle bouton c
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        self.text = ""  # on remet le txt vide
        self.calcul = ""
        self.entry.set(self.text)
    def Button_parent_ouvr(self):
        self.calcul += "("
        self.text += "("
        self.entry.set(self.text)
    def Button_parent_ferm(self):
        self.calcul += ")"
        self.text += ")"
        self.entry.set(self.text)
    def Button_sin(self):
        self.calcul += "sin("
        self.text += "sin("
        self.entry.set(self.text)
    def Button_cos(self):
        self.calcul += "cos("
        self.text += "cos("
        self.entry.set(self.text)
    def Button_tan(self):
        self.calcul += "tan("
        self.text += "tan("
        self.entry.set(self.text)
    def Button_pi(self):
        self.calcul += 'pi'
        self.text += "π"
        self.entry.set(self.text)
    def Button_sqr(self):
        self.calcul+= '**2'
        self.text += "²"
        self.entry.set(self.text)
    def Button_sqrt(self):
        self.calcul += 'sqrt('
        self.text += "√("
        self.entry.set(self.text)
    def ButtonH(self):
        self.geometry("400x400")
        self.label_hist=Label(self, text=self.historique).place(x=200, y=8)


    def operation(self):  #opération
        try:
            self.entry.set(str(round(eval(self.calcul),8)))  # arrondi pour
que les fonctions cos, sin, tan donnent des résultats cohérents à sin(pi)
par exemple
            self.historique+=self.text + " = " +
str(round(eval(self.calcul), 8)) + "\n"
            self.text = ""
            self.calcul=""
        except:
            self.entry.set("ERROR")
            #self.historique += self.text + " = " +
str(round(eval(self.calcul), 8)) + "\n"
            self.text = ""
            self.calcul = ""


def main():
    fenetre = Fenetre()
    fenetre.geometry("195x400")
    fenetre.mainloop()
```
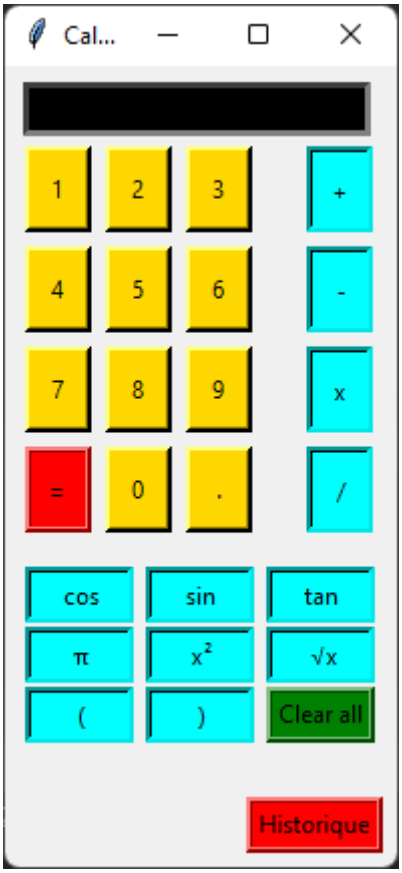
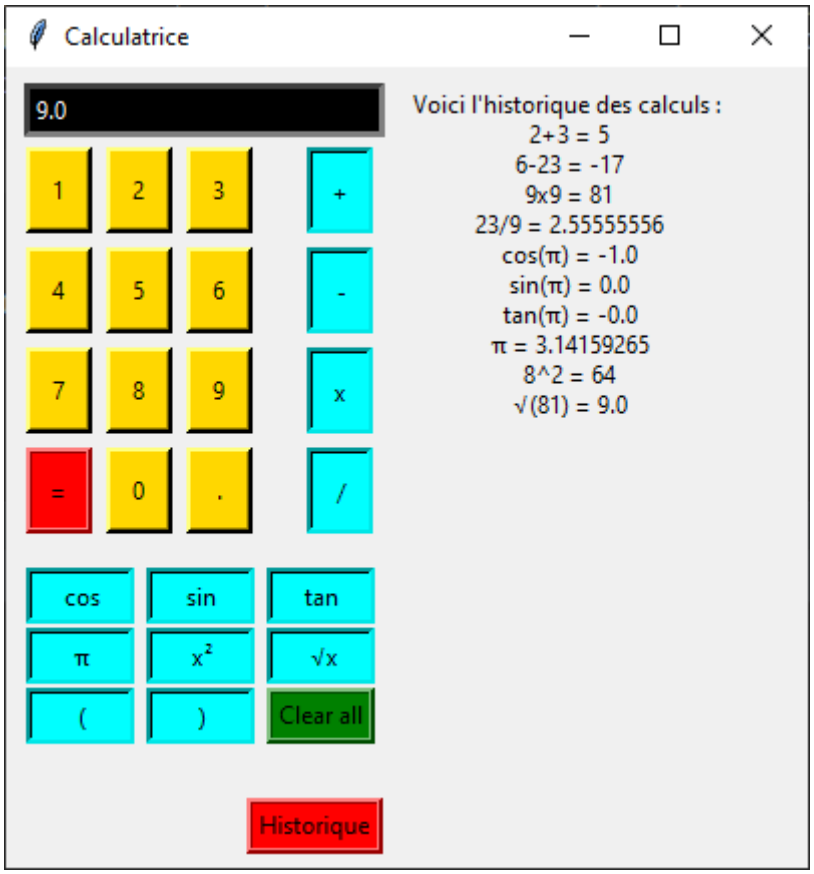

```
if __name__ == '__main__':
    main()
```

Affichage :



#Testons toutes les opérations et l'historique :



#Pour des calculs plus complexes :