Lecture 09: Python GUI

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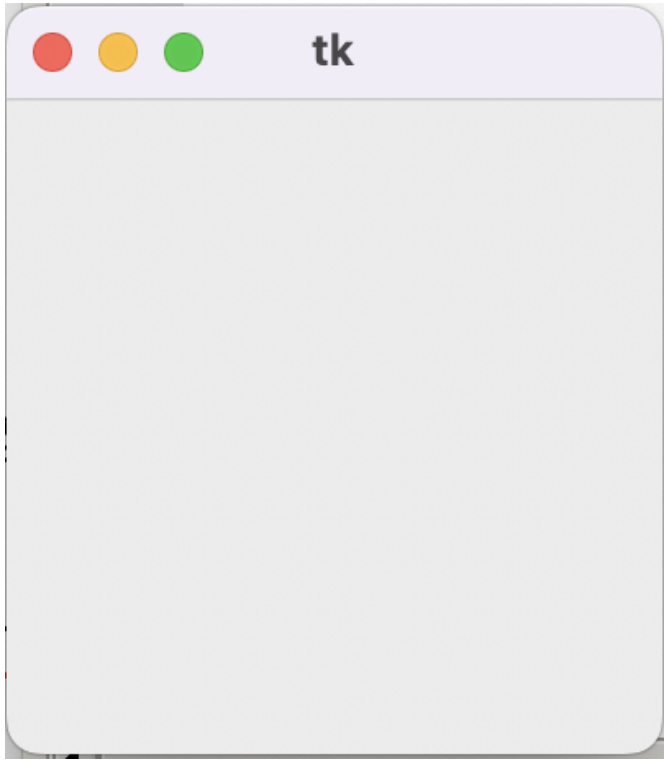
A first GUI application

```
from tkinter import *
myroot = Tk()
myroot.mainloop()
```



Title, geometry, resizable

```
from tkinter import *
myroot = Tk()
myroot.geometry('350x150')
myroot.title("First GUI Application")
myroot.mainloop()
```

```
from tkinter import *
myroot = Tk()
myroot.geometry("600x400")
myroot.title("First GUI Application")
myroot.resizable(width=True,height=False)
myroot.mainloop()
```

Add a Label

```
from tkinter import *
myroot = Tk()
myroot.geometry('350x150')
myroot.title("First GUI Application")

label1 = Label(myroot,text="This is a label")
label1.pack()

myroot.mainloop()
```

And two buttons

```
from tkinter import *
myroot = Tk()
myroot.geometry('350x150')
myroot.title("First GUI Application")

label1 = Label(myroot,text="0")
label1.pack()

btn1 = Button(myroot,text="Increase")
btn1.pack()
btn2 = Button(myroot,text="Decrease")
btn2.pack()

myroot.mainloop()
```

A simple GUI

Object Oriented GUI

```
from tkinter import *

class MyApplication(Tk):
    def __init__(self):
        super().__init__()
        self.title("Event Handling")

        self.label1 = Label(self,text="This is a label")
        self.label1.pack()

        self.btn1 = Button(self,text="Increase")
        self.btn1.pack()
        self.btn2 = Button(self,text="Decrease")
        self.btn2.pack()

if __name__ == "__main__":
    myApp = MyApplication()
    myApp.geometry('350x150')
    myApp.mainloop()
```

Simple Event Handling

```
from tkinter import *
class MyApplication(Tk):
    def __init__(self):
        super().__init__()
        self.title("Event Handling")

        self.label1 = Label(self,text="0")
        self.label1.pack()

        self.btn1 = Button(self,text="Increase")
        self.btn1.pack()
        self.btn2 = Button(self,text="Decrease")
        self.btn2.pack()

        def clicked1(event):
            self.label1.config(text = int(self.label1['text'])+1)
        def clicked2(event):
            self.label1.config(text = int(self.label1['text'])-1)

        self.btn1.bind('<Button-1>',clicked1)
        self.btn2.bind('<Button-1>',clicked2)
```

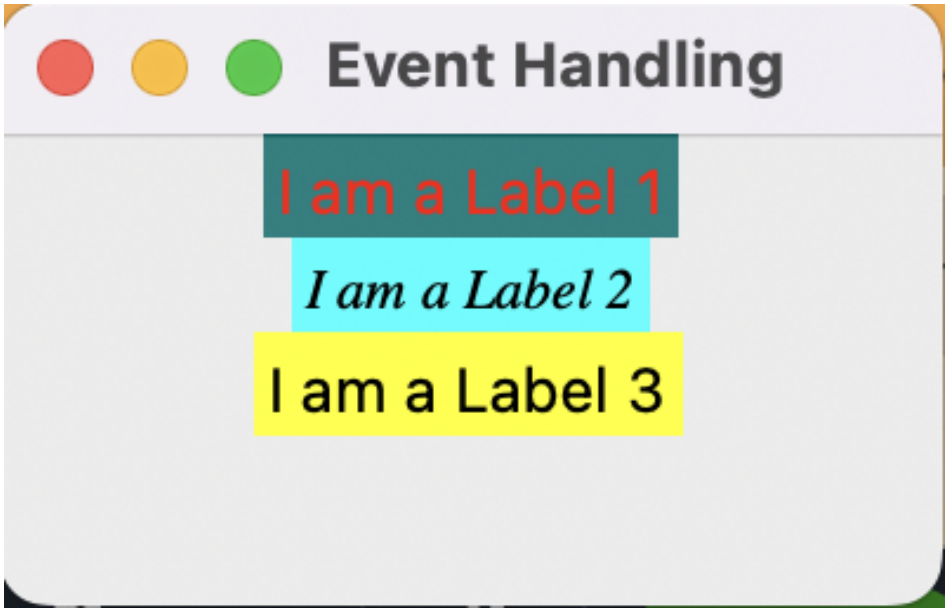
Simple Event Handling

```
from tkinter import *
class MyApplication(Tk):
    def __init__(self):
        super().__init__()
        self.title("Event Handling")

        self.label1 = Label(self,text="0")
        self.label1.pack()

        def clicked1():
            self.label1.config(text = int(self.label1['text'])+1)
        def clicked2():
            self.label1.config(text = int(self.label1['text'])-1)

        self.btn1 = Button(self,text="Increase",command=clicked1)
        self.btn1.pack()
        self.btn2 = Button(self,text="Decrease",command=clicked2)
        self.btn2.pack()
```

Layout Manager - Pack

```
from tkinter import *

class MyApplication(Tk):
    def __init__(self):
        super().__init__()
        self.title("Event Handling")
        self.label1 = Label(self,text="I am a Label 1",fg="red",
                            bg = "teal")
        self.label1.pack()
        self.label2 = Label(self,text="I am a Label 2",
                            font="Times 12 italic",bg = "cyan")
        self.label2.pack()
        self.label3 = Label(self,text="I am a Label 3",bg = "yellow")
        self.label3.pack()
if __name__ == "__main__":
    myApp = MyApplication()
    myApp.geometry("200x100")
    myApp.mainloop()
```

Three Labels



Fill

```
from tkinter import *

class MyApplication(Tk):
    def __init__(self):
        super().__init__()
        self.title("Event Handling")
        self.label1 = Label(self,text="I am a Label 1",fg="red",
                            bg = "teal")
        self.label1.pack(fill=X)
        self.label2 = Label(self,text="I am a Label 2",
                            font="Times 12 italic",bg = "cyan")
        self.label2.pack(fill=X)
        self.label3 = Label(self,text="I am a Label 3",bg = "yellow")
        self.label3.pack(fill=X)
if __name__ == "__main__":
    myApp = MyApplication()
    myApp.geometry("200x100")
    myApp.mainloop()
```

Three Labels

padx,pady

```
from tkinter import *

class MyApplication(Tk):
    def __init__(self):
        super().__init__()
        self.title("Event Handling")
        self.label1 = Label(self,text="I am a Label 1",fg="red",
                            bg = "teal")
        self.label1.pack(fill=X,padx=10)
        self.label2 = Label(self,text="I am a Label 2",
                            font="Times 12 italic",bg = "cyan")
        self.label2.pack(fill=X,pady=10)
        self.label3 = Label(self,text="I am a Label 3",bg = "yellow")
        self.label3.pack(fill=X)
if __name__ == "__main__":
    myApp = MyApplication()
    myApp.geometry("200x100")
    myApp.mainloop()
```

Side

```
from tkinter import *

class MyApplication(Tk):
    def __init__(self):
        super().__init__()
        self.title("Event Handling")
        self.label1 = Label(self,text="I am a Label 1",fg="red",
                            bg = "teal")
        self.label1.pack(side=TOP)
        self.label2 = Label(self,text="I am a Label 2",
                            font="Times 12 italic",bg = "cyan")
        self.label2.pack(side=LEFT)
        self.label3 = Label(self,text="I am a Label 3",bg = "yellow")
        self.label3.pack(side=RIGHT)
if __name__ == "__main__":
    myApp = MyApplication()
    myApp.geometry("200x100")
    myApp.mainloop()
```

Layout Manager - Place

```
from tkinter import *

class MyApplication(Tk):
    def __init__(self):
        super().__init__()
        self.title("Event Handling")
        self.label1 = Label(self,text="I am a Label 1",fg="red",
                            bg = "teal")
        self.label1.place(x=30,y=10,width=120,height=25)
        self.label2 = Label(self,text="I am a Label 2",
                            font="Times 12 italic",bg = "cyan")
        self.label2.place(x=30,y=40,width=120,height=25)
        self.label3 = Label(self,text="I am a Label 3",bg = "yellow")
        self.label3.place(x=30,y=70,width=120,height=25)
if __name__ == "__main__":
    myApp = MyApplication()
    myApp.geometry("200x100")
    myApp.mainloop()
```

Layout Manager - Grid

```
from tkinter import *

class MyApplication(Tk):
    def __init__(self):
        super().__init__()
        self.title("Event Handling")
        for i in range(1,10):
            Button(self,text=i).grid(row=(i-1)//3,column=(i-1)%3)
if __name__ == "__main__":
    myApp = MyApplication()
    myApp.geometry("200x100")
    myApp.mainloop()
```

Variables

- Some widgets (like text entry widgets, radio buttons and so on) can be connected directly to application variables by using special options: variable, textvariable, onvalue, offvalue, and value.
- This connection works both ways: if the variable changes for any reason, the widget it's connected to will be updated to reflect the new value.
- These Tkinter control variables are used like regular Python variables to keep certain values.
- It's not possible to hand over a regular Python variable to a widget through a variable or textvariable option.
- The only kinds of variables for which this works are variables that are subclassed from a class called Variable, defined in the Tkinter module.

Variables

```
from tkinter import *
class MyApplication(Tk):
    def __init__(self):
        super().__init__()
        self.title("Event Handling")
        mystr = StringVar()
        mystr.set('0')
        self.label1 = Label(self,textvariable=mystr)
        self.label1.pack()
        def clicked1():
            mystr.set(int(mystr.get())+1)
        def clicked2():
            mystr.set(int(mystr.get())-1)
        self.btn1 = Button(self,text="Increase",command=clicked1)
        self.btn1.pack()
        self.btn2 = Button(self,text="Decrease",command=clicked2)
        self.btn2.pack()
```

Variables - Another Example

```
from tkinter import *


myroot = Tk()
myroot.geometry('200x100')
num1 = BooleanVar()
def selectIt():
    if num1.get() == True:
        print("Python Selected")
    else:
        print("Python Not Selected")
def changeIt():
    num1.set(not num1.get())
mychk1 =  Checkbutton(myroot, variable = num1, text = 'Python', command =
mychk1.pack()
mybtn1 = Button(myroot,text='Toggle',command=changeIt)
mybtn1.pack()
```

Frames

```
from tkinter import *
root = Tk()
root.title("Search")
root.geometry("420x100")
f1 = Frame(root)
lblfind = Label(f1,text="Find:")
lblfind.pack(side=LEFT)
entry = Entry(f1,width=200)
entry.pack(side=LEFT)
f1.pack()
f2 = Frame(root)
lbloption=Label(f2,text="Options:")
chk1=Checkbutton(f2,text="Regular Expression")
chk2=Checkbutton(f2,text="Whole word")
chk3=Checkbutton(f2,text="Match Case")
lbloption.grid(row=0,column=0)
chk1.grid(row=0,column=1)
chk2.grid(row=0,column=2)
chk3.grid(row=0,column=3)
f2.pack()
f3 = Frame(root)
btn1=Button(f3,text="Find")
btn2=Button(f3,text="Close")
btn1.pack(side=RIGHT)
btn2.pack(side=RIGHT)
f3.pack(fill=X)
root.mainloop()
```