Mastering Python

الدرس # 10_2

واجهات الشاشات والرسومات ,Tkinter & GUI

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V1.0 - DEC 2019

Agenda

- What is Tkinter?
- Tkinter’s Widgets
- TK Examples

What is Tkinter

Tkinter is Python's standard GUI (Graphical User Interface) ToolKit package.

It is a thin object-oriented layer on top of Tk.

https://wiki.python.org/moin/TkInter

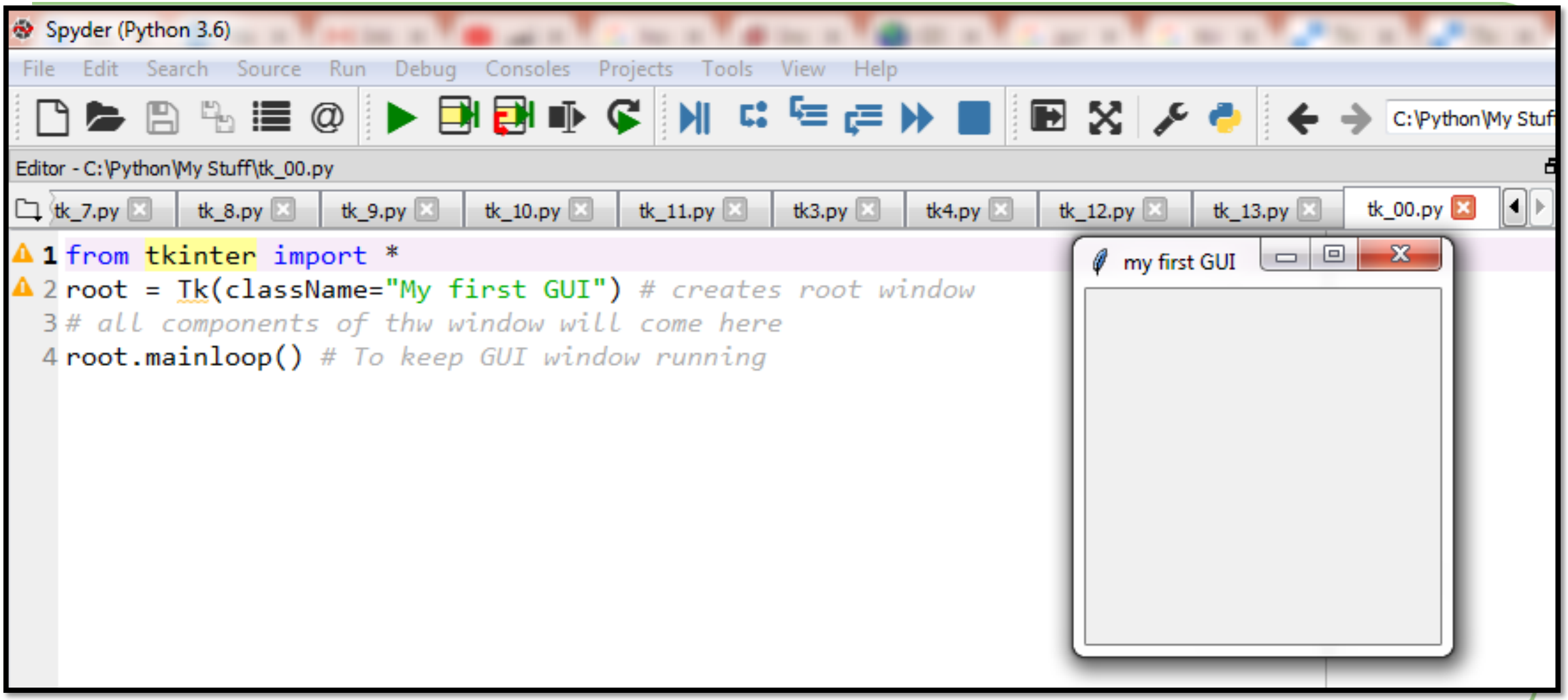
Widgets

Frame	**Used as a container to house other widgets and add borders**
Label	**Display text or images**
Labelframe	**A frame that by default displays a border and title**
Button	**Standard button that calls a function when clicked**
Checkbutton	**Check box for toggling a value (can have callback on click)**
Radiobutton	**Standard radio buttons**
Entry	**Single line editable text entry**
Text	**Multiple line editable text entry**
Message	**Multiple line display text that can be styled**
Combobox	**A single line text entry field that also has a drop down select list. Choose pre-defined items or enter a custom value.**
Listbox	**Multiple line select list**
Scrollbar	**Vertical or horizontal**
Sizegrip	**For adding a triangle in the bottom right corner of a window to make it easier to grab and resize**
Progressbar	**Progress bars that can be customized in many ways**
Scale	**Sliding scale to be clicked and dragged with mouse**
Spinbox	**Like a single line text entry widget with up and down arrows on the side to increment or decrement. Mousewheel up and down to raise and lower values**
Separator	**Visually separate widgets vertically or horizontally**
Notebook	**Tabbed contents**
Panedwindow	**Like a frame that contains a horizontal or vertical set of frames that are resizeable in relation to each other**
Canvas	**For drawing graphics like lines, circles, arcs, ovals, and rectangles**
Toplevel	**A window just like the main window with its own title bar and can be moved and resized on its own. If the main window is destroyed, all other top levels are destroyed too**
Menu	**Menu bar for the top of the window. Typically things like "File", "Edit", and "View".**
Optionmenu	**Similar to Combobox or HTML select. A dropdown option select menu.**

Pop-up Dialog Windows

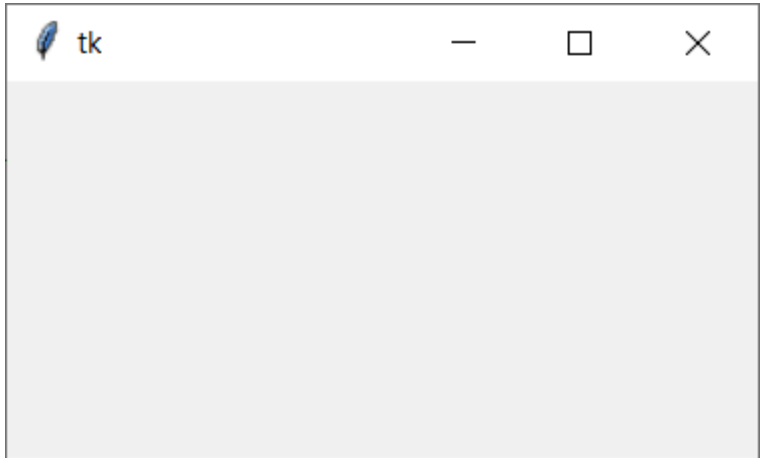
askquestion	**Ask a question with a yes or no response.**
askyesno	**Ask yes or no.**
askyesnocancel	**Ask yes, no, or cancel.**
askokcancel	**Ask ok or cancel.**
askretrycancel	**Ask retry or cancel**
showinfo	**Show pop-up with text and info icon.**
showwarning	**Show pop-up with text and warning icon.**
showerror	**Show pop-up with text and error icon.**
Colorchooser	**Visual color picker**
Filedialog	**Allow user to pick a file from the file system**

Show a window

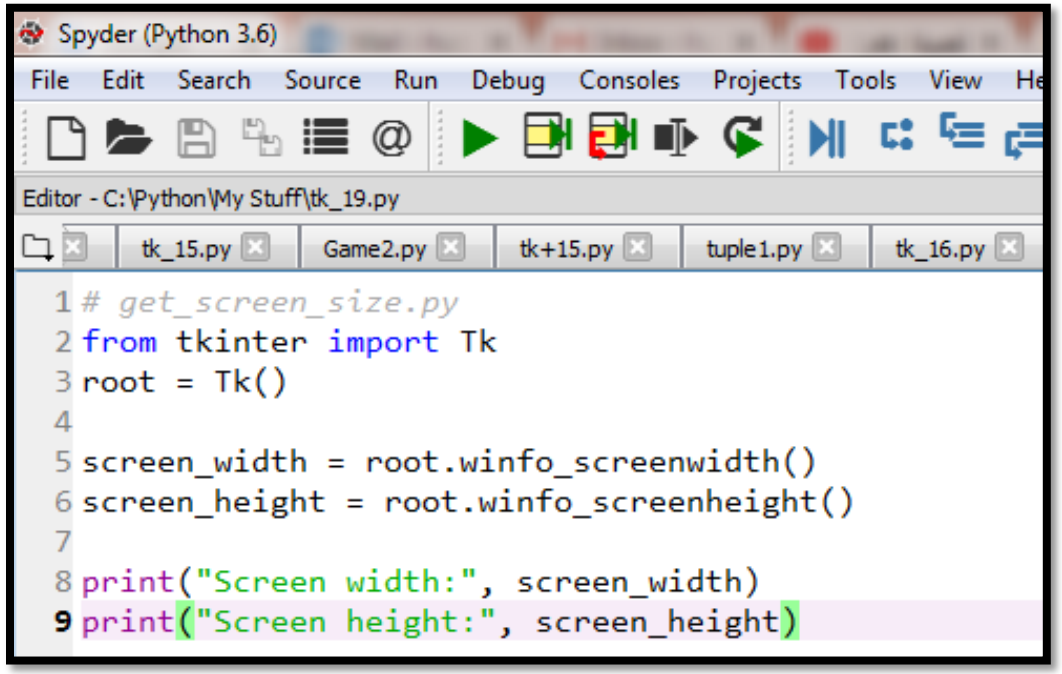


Show a window

```python
# set_window_geometry.py
from tkinter import Tk
root = Tk()

# Make window 300x150 and place at position (50,50)
root.geometry("300x150+50+50")

root.mainloop()
```



Screen Size



Output

```
In [18]: runfile('C:/Python/My Stuff/tk_19.py', wdir='C:/
Python/My Stuff')
Screen width: 1366
Screen height: 768
```

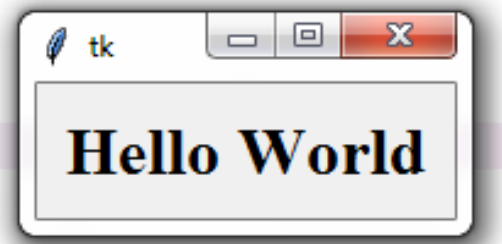
Labels

```python
import tkinter as tk

root = tk.Tk()

label = tk.Label(root, text="Hello World", padx=10, pady=10)
label.pack()

root.mainloop()
```

Editor - C:\Python\My Stuff\tk_1.py

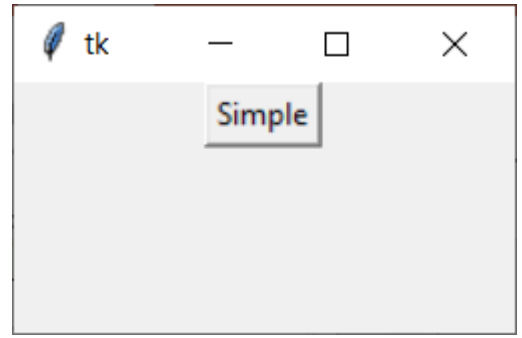
IN_SKlearn7.py | DL2.py | dl3.py | DL_NN_Mutlilayer1.py | GDAL1.py | tk2.py | tk1.py | tk_1.py

```python
import tkinter as tk

root = tk.Tk()

label = tk.Label(root, text="Hello World",font=('times', 20, 'bold'),
                 padx=10, pady=10)
label.pack()

root.mainloop()

```



Button

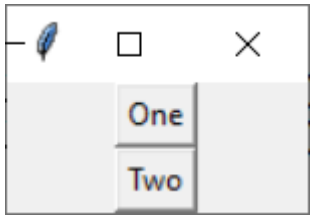
```
1  from tkinter import *
2
3  top = Tk()
4
5  top.geometry("200x100")
6
7  b = Button(top,text = "Simple")
8
9  b.pack()
10
11 top.mainloop()
```



https://www.javatpoint.com/python-tkinter

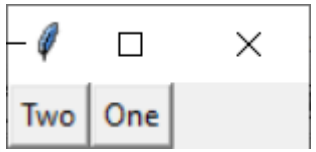
Pack

```python
from tkinter import *

win = Tk()
b1 = Button(win, text="One")
b2 = Button(win, text="Two")
b1.pack()
b2.pack()

win.mainloop()
```




```python
from tkinter import *

win = Tk()
b1 = Button(win, text="One")
b2 = Button(win, text="Two")
b1.pack(side=LEFT, padx=10)
b2.pack(side=LEFT, padx=10)

win.mainloop()
```

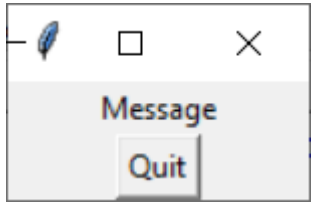

```python
from tkinter import *

win = Tk()
b1 = Button(win, text="One")
b2 = Button(win, text="Two")
b2.pack(side=LEFT)
b1.pack(side=LEFT)

win.mainloop()
```



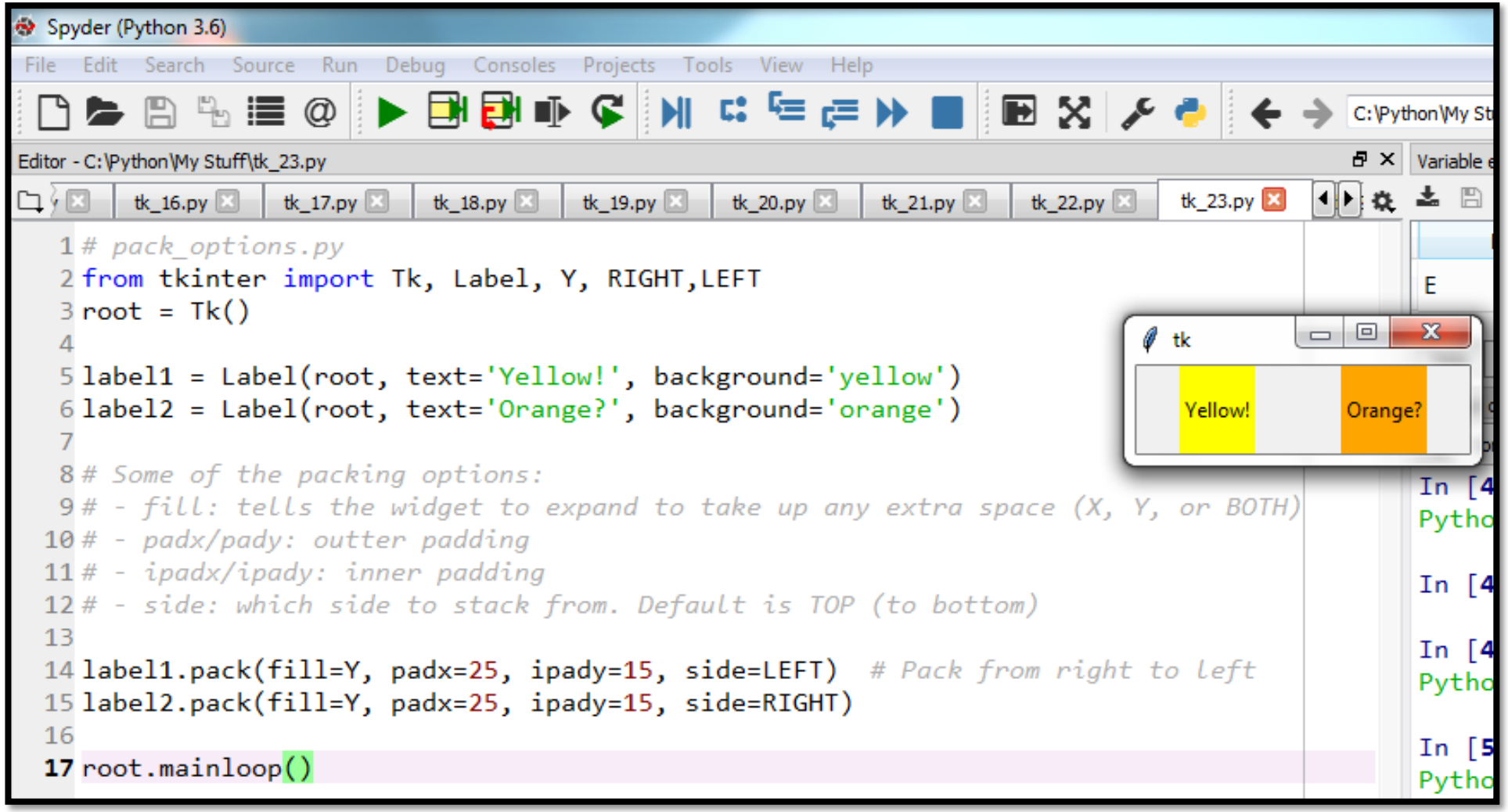

```python
from tkinter import *

root = Tk()
frame = Frame(root)
frame.pack()
bottomframe = Frame(root)
bottomframe.pack( side = BOTTOM )
redbutton = Button(frame, text="Red", fg="red")
redbutton.pack( side = LEFT)
greenbutton = Button(frame, text="Brown", fg="brown")
greenbutton.pack( side = LEFT )
bluebutton = Button(frame, text="Blue", fg="blue")
bluebutton.pack( side = LEFT )
blackbutton = Button(bottomframe, text="Black", fg="black")
blackbutton.pack( side = BOTTOM)
root.mainloop()
```

Pack

```
1 from tkinter import *
2
3 root = Tk()
4
5 label = Label(root, text="Message")
6 label.pack()
7
8 button = Button(root, text="Quit", command=root.destroy)
9 button.pack()
10
11 mainloop()
```

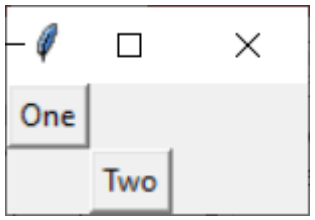


Labels & Packing

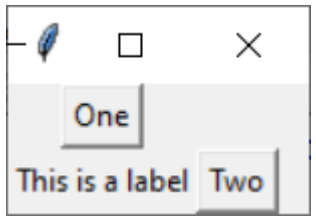


Grid

```python
from tkinter import *

win = Tk()
b1 = Button(win, text="One")
b2 = Button(win,text="Two")
b1.grid(row=0, column=0)
b2.grid(row=1, column=1)

win.mainloop()
```

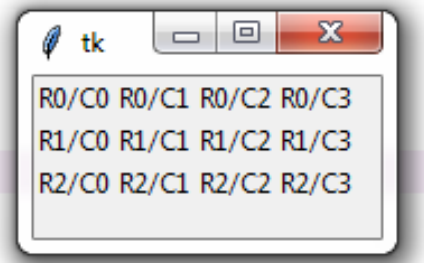



```python
from tkinter import *

win = Tk()
b1 = Button(win, text="One")
b2 = Button(win,text="Two")
l = Label(win, text="This is a label")
l.grid(row=1, column=0)
b1.grid(row=0, column=0)
b2.grid(row=1, column=1)

win.mainloop()
```



Grid layout

```
1 import tkinter
2 root = tkinter.Tk(  )
3 for r in range(3):
4    for c in range(4):
5       tkinter.Label(root, text='R%s/C%s'%(r,c),borderwidth=1 ).grid(row=r,column=c)
6
7 root.mainloop(  )
```



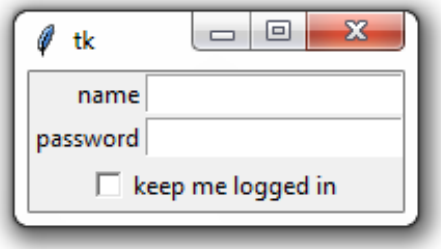
Spyder (Python 3.6)

File Edit Search Source Run Debug Consoles Projects Tools View Help

Editor - C:\Python\My Stuff\tk_16.py

tk_11.py | tk3.py | tk4.py | tk_12.py | tk_13.py | tk_00.py | tk_14.py | tk_15.py | Game2.py

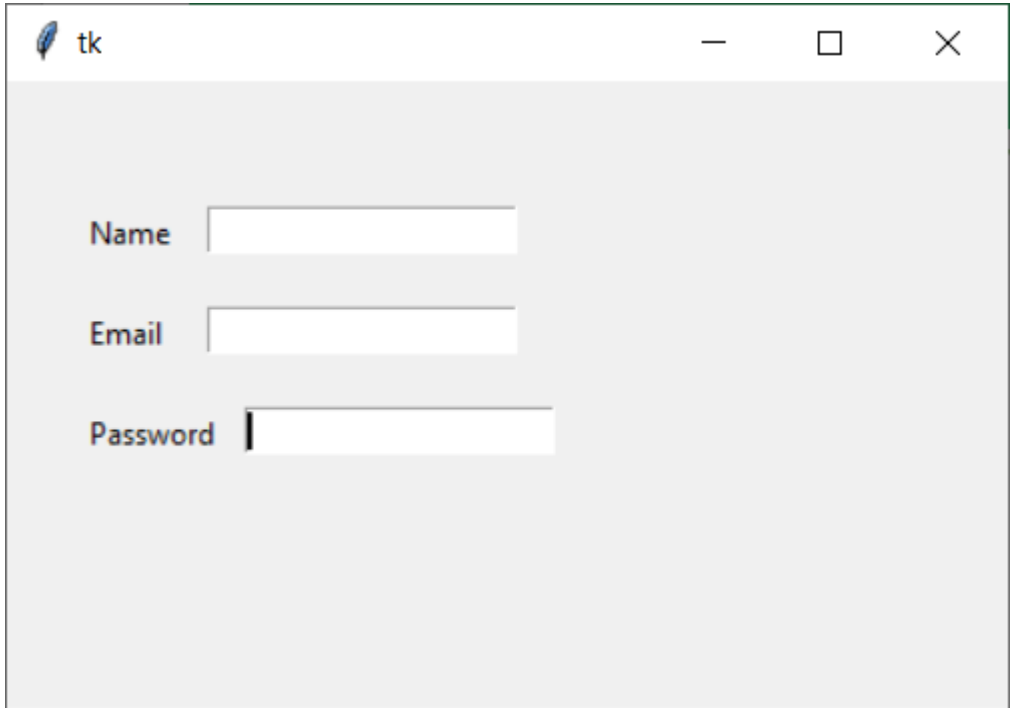
```
1 from tkinter import *
2
3 var = Tk()
4 name = Label(var, text = "name")
5 password = Label(var, text = "password")
6 entry1 = Entry(var)
7 entry2 = Entry(var)
8 name.grid(row=0, sticky = E)
9 password.grid(row=1, sticky = E)
10 entry1.grid(row=0, column=1)
11 entry2.grid(row=1, column=1)
12 c = Checkbutton(var, text = "keep me logged in")
13 c.grid(row=2, columnspan=2)
14 var.mainloop()
```



place() method

The place() geometry manager organizes the widgets to the specific x and y coordinates.

```
1 from tkinter import *
2 top = Tk()
3 top.geometry("400x250")
4 name = Label(top, text = "Name").place(x = 30,y = 50)
5 email = Label(top, text = "Email").place(x = 30, y = 90)
6 password = Label(top, text = "Password").place(x = 30, y = 130)
7 e1 = Entry(top).place(x = 80, y = 50)
8 e2 = Entry(top).place(x = 80, y = 90)
9 e3 = Entry(top).place(x = 95, y = 130)
10 top.mainloop()
```



https://www.javatpoint.com/python-tkinter

Buttons Calls

Spyder (Python 3.6)

File Edit Search Source Run Debug Consoles Projects Tools View Help

C:\Python\My Stuff

Editor - C:\Python\My Stuff\tk3.py

tk_3.py | tk_4.py | tk_5.py | tk_6.py | tk_7.py | tk_8.py | tk_9.py | tk_10.py | tk_11.py | tk3.py

```
1 from tkinter import *
2
3 def Pressed():
4         print ('Hello, Press me again ')
5
6 root = Tk()
7 button = Button(root, text = 'Press Me', command = Pressed)
8 button.pack(pady=40, padx = 40)
9 root.mainloop()
```

Variable explorer

Name	Type	Size
E	str	1
N	str	1

Help | Variable explorer | File exp

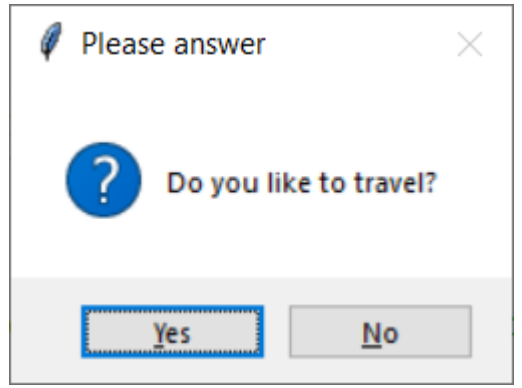
IPython console

Console 1/A

```
In [54]: runfile('C:/P
wdir='C:/Python/My Stu

Hello, Press me again
Hello, Press me again
Hello, Press me again
```

Message Box

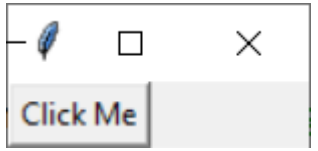
```python
from tkinter import *
from tkinter import messagebox

def Pressed():
    dialog_title = 'Please answer'
    dialog_text = 'Do you like to travel?'
    answer = messagebox.askquestion(dialog_title, dialog_text)
    if answer == 'yes':
        print('I like this !')
    else:  # 'no'
        print('You must have clicked the wrong button by accident.')

root = Tk()
button = Button(root, text = 'Press Me', command = Pressed)
button.pack(pady=40, padx = 40)
root.mainloop()
```

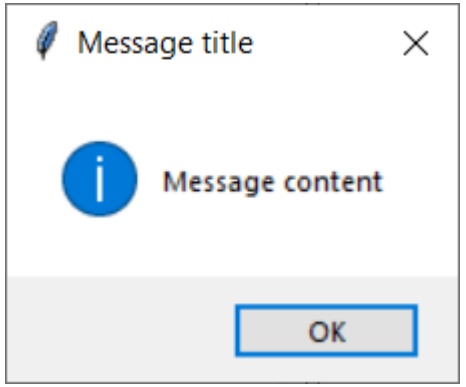



```
I like this !
You must have clicked the wrong button by accident.
```

Create Button

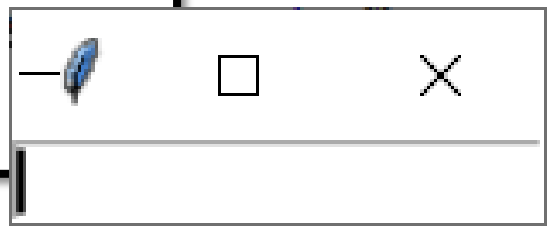
```
1 from tkinter import *
2 window = Tk()
3 window.title("Welcome to LikeGeeks app")
4
5 def clicked():
6     messagebox.showinfo('Message title','Message content')
7
8 btn = Button(window, text="Click Me", command=clicked)
9 btn.grid(column=0, row=0)
10 window.mainloop()
```



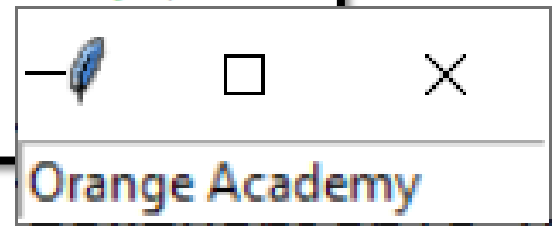


input

```
1 from tkinter import *
2
3 win = Tk()
4 v = StringVar()
5 e = Entry(win,textvariable=v)
6 e.pack()
7
8 win.mainloop()
```



```
1 from tkinter import *
2
3 win = Tk()
4 v = StringVar()
5 e = Entry(win,textvariable=v)
6 e.pack()
7 v.set("Orange Academy")
8 print(v.get())
9
10 win.mainloop()
```



strVar = StringVar()	# Holds a string; the default value is an empty string ""
intVar = IntVar()	# Holds an integer; the default value is 0
dbVar = DoubleVar()	# Holds a float; the default value is 0.0
blVar = BooleanVar()	# Holds a Boolean, it ...

Input box & Button

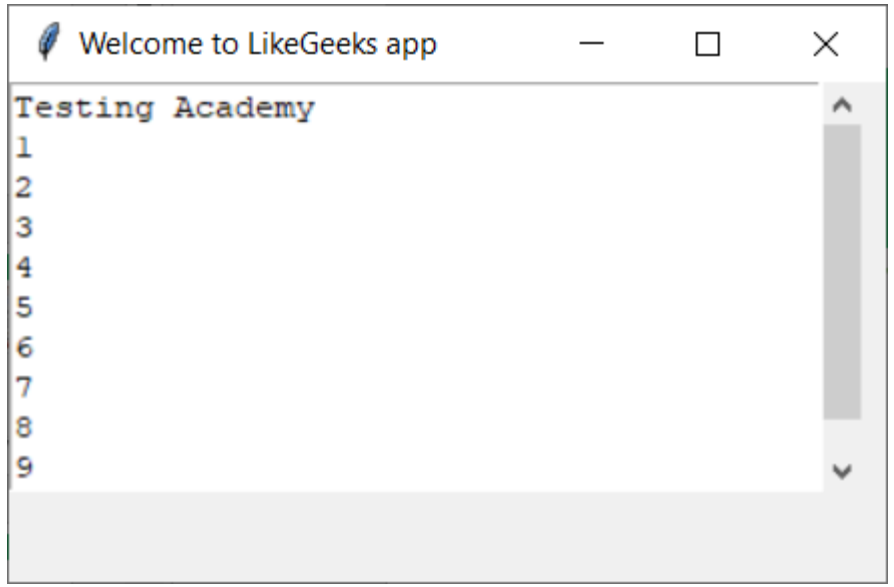
```
1 from tkinter import *
2
3 root = Tk(className ="My first GUI")
4 svalue = StringVar()
5 w = Entry(root,textvariable=svalue)
6
7 w.pack()
8
9 def act():
10     print ("you entered")
11     print ('%s' % svalue.get())
12
13 foo = Button(root,text="Press Me", command=act)
14
15 foo.pack()
16 root.mainloop()
```

Output


```
you entered
Hussam
```

Scroll Text

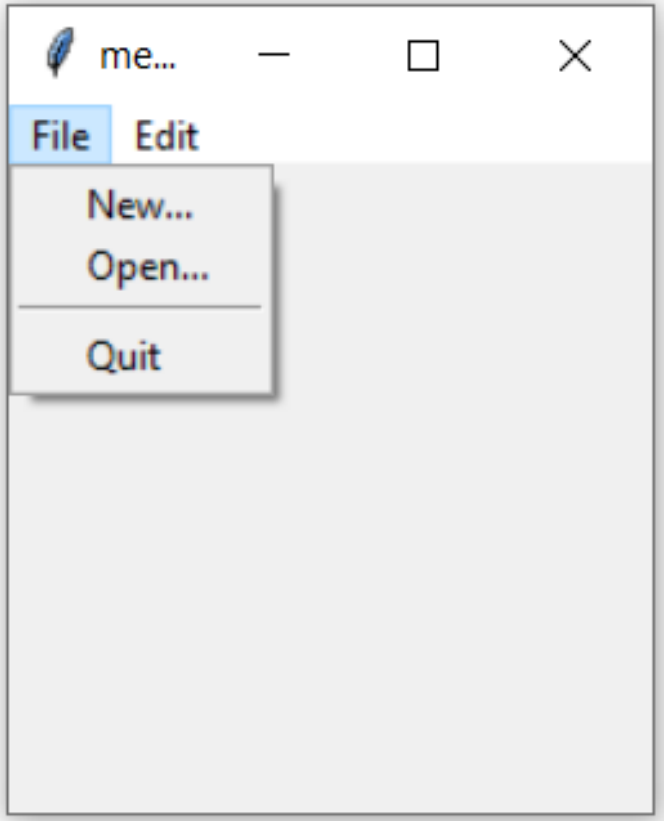
```
from tkinter import *
from tkinter import scrolledtext
window = Tk()
window.title("Welcome to LikeGeeks app")
window.geometry('350x200')
txt = scrolledtext.ScrolledText(window,width=40,height=10)
txt.grid(column=0,row=0)
window.mainloop()
```



Menus

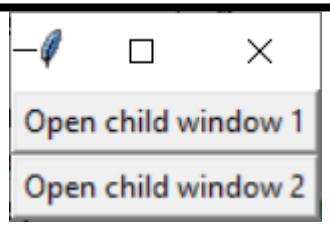
```
1 from tkinter import *
2
3 root = Tk()
4 root.title('menu_win')
5
6 def notdone():
7     messagebox.showinfo('Not implemented', 'Not yet available')
8
9 top = Menu(root)
10 root.config(menu=top)
11
12 file = Menu(top, tearoff=0)
13 file.add_command(label='New...',  command=notdone)
14 file.add_command(label='Open...', command=notdone)
15 file.add_separator()
16 file.add_command(label='Quit',    command=root.destroy)
17 top.add_cascade(label='File',    menu=file)
18
19 edit = Menu(top, tearoff=0)
20 edit.add_command(label='Cut',     command=notdone)
21 edit.add_command(label='Paste',   command=notdone)
22 top.add_cascade(label='Edit',    menu=edit)
23
24 root.mainloop()
```

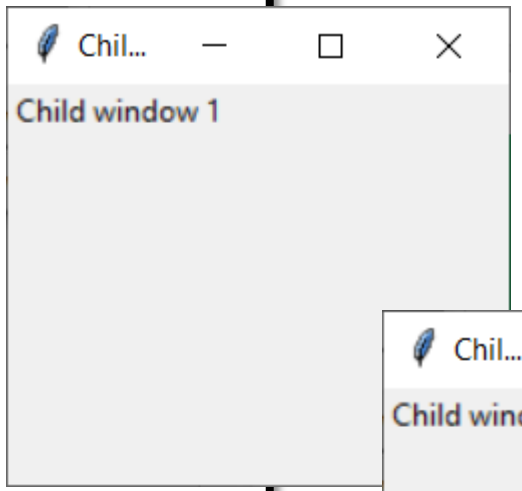
create the menubar
display the menu

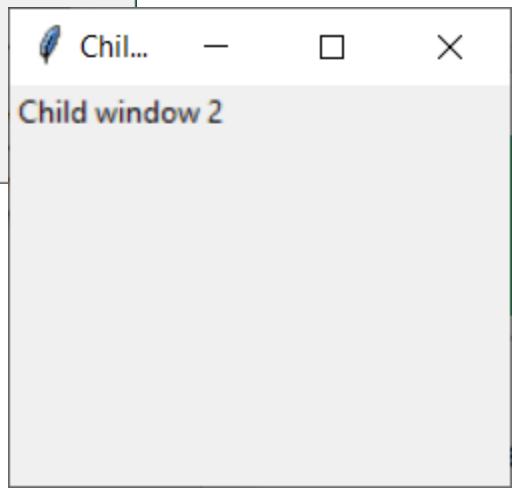


Create multi windows

```
1 from tkinter import *
2
3 def open_child1():
4     c = Toplevel(root)
5     c.title("Child window 1")
6     c.geometry('200x160+230+130')
7     Label(c, text="Child window 1").grid()
8
9 def open_child2():
10    c = Toplevel(root)
11    c.title("Child window 2")
12    c.geometry('200x160+230+130')
13    Label(c, text="Child window 2").grid()
14
15 root = Tk()
16 root.title("root window")
17 #root.geometry('200x150')
18 Button(root, text="Open child window 1", command=open_child1).grid()
19 Button(root, text="Open child window 2", command=open_child2).grid()
20
21 root.mainloop()
```



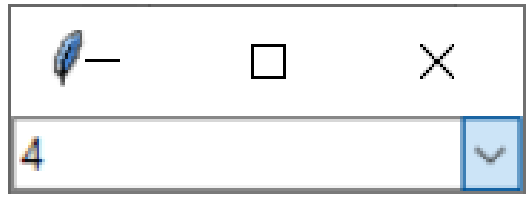




combo

```
1  import tkinter as tk
2  from tkinter import ttk
3  root = tk.Tk()
4
5  combo = ttk.Combobox(root)
6  combo['values']= (1, 2, 3, 4, 5, "Text")
7  combo.current(3)
8  combo.grid(column=0, row=0)
9
10 root.mainloop()
```

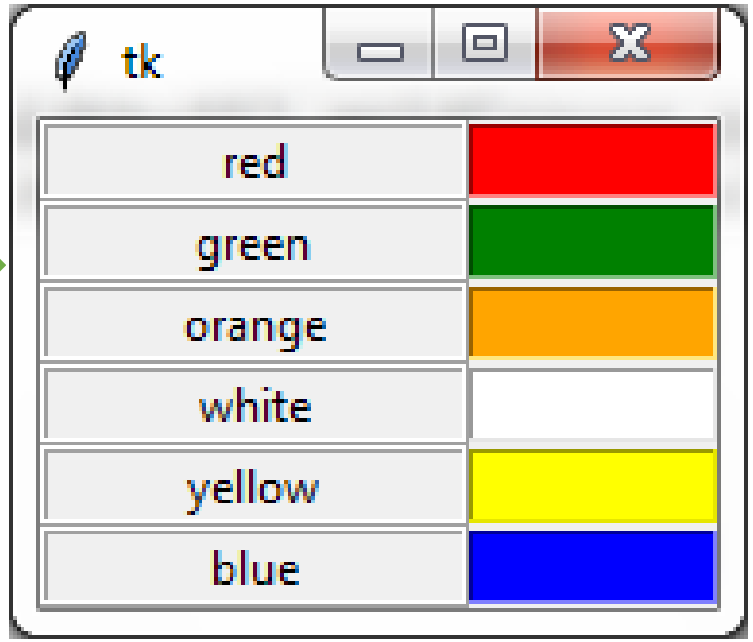
Output



Input box & Colors

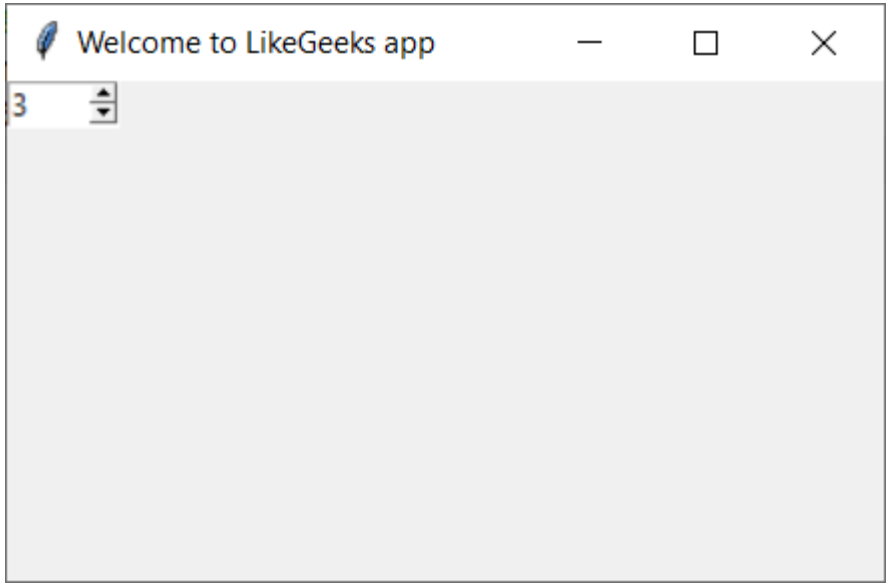
```
from tkinter import *

colours = ['red','green','orange','white','yellow','blue']

r = 0
for c in colours:
    Label(text=c, relief=RIDGE,width=15).grid(row=r,column=0)
    Entry(bg=c, relief=SUNKEN,width=10).grid(row=r,column=1)
    r = r + 1

mainloop()
```

Output



Spinbox

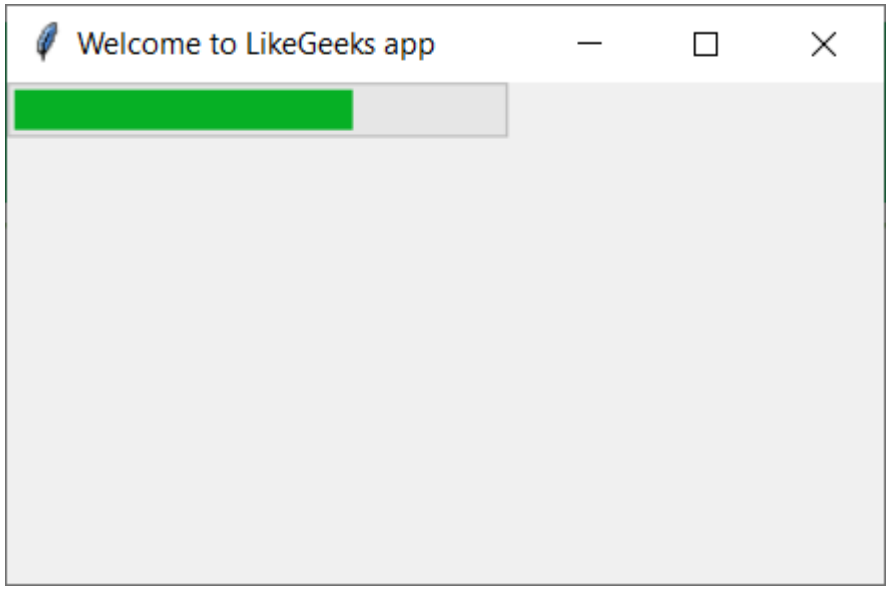
```
1 from tkinter import *
2 window = Tk()
3 window.title("Welcome to LikeGeeks app")
4 window.geometry('350x200')
5 spin = Spinbox(window, from_=0, to=100, width=5)
6 spin.grid(column=0,row=0)
7 window.mainloop()
```




```
var =IntVar()
var.set(36)
spin = Spinbox(window, from_=0, to=100, width=5, textvariable=var)
```

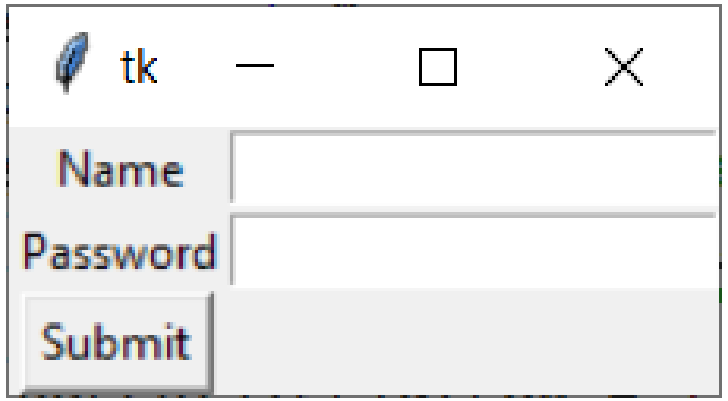
Progress Bar

```
1 from tkinter import *
2 from tkinter.ttk import Progressbar
3 window = Tk()
4 window.title("Welcome to LikeGeeks app")
5 window.geometry('350x200')
6 bar = Progressbar(window, length=200)
7 bar['value'] = 70
8 bar.grid(column=0,row=0)
9 window.mainloop()
```



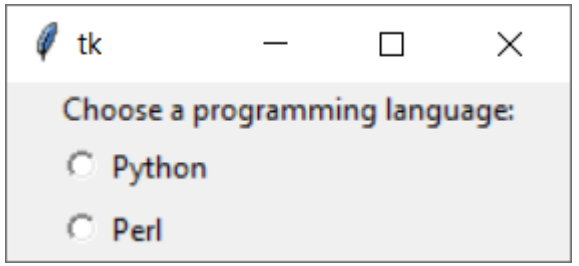
User Name and Password

```
1 from tkinter import *
2 parent = Tk()
3 name = Label(parent,text = "Name").grid(row = 0, column = 0)
4 e1 = Entry(parent).grid(row = 0, column = 1)
5 password = Label(parent,text = "Password").grid(row = 1, column = 0)
6 e2 = Entry(parent).grid(row = 1, column = 1)
7 submit = Button(parent, text = "Submit").grid(row = 4, column = 0)
8 parent.mainloop()
```



RadioButtons

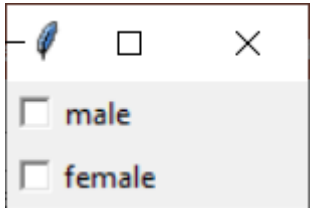
```python
import tkinter as tk

root = tk.Tk()

v = tk.IntVar()

tk.Label(root,
         text="""Choose a programming language:""",
         justify = tk.LEFT,
         padx = 20).pack()
tk.Radiobutton(root,
               text="Python",
               padx = 20,
               variable=v,
               value=1).pack(anchor=tk.W)
tk.Radiobutton(root,
               text="Perl",
               padx = 20,
               variable=v,
               value=2).pack(anchor=tk.W)

root.mainloop()
```



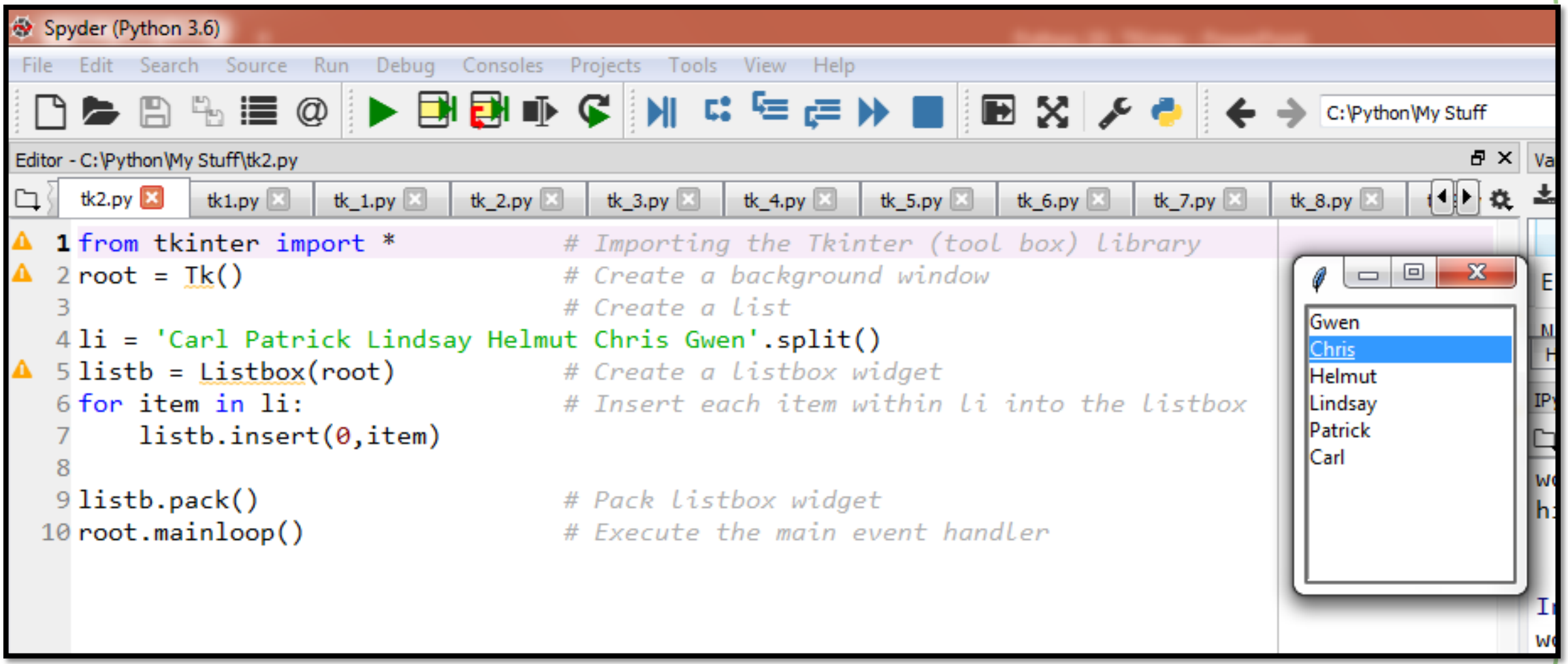
https://www.python-course.eu/tkinter_canvas.php

Check boxs

```
1 from tkinter import *
2 master = Tk()
3
4 var1 = IntVar()
5 Checkbutton(master, text="male", variable=var1).grid(row=0, sticky=W)
6
7 var2 = IntVar()
8 Checkbutton(master, text="female", variable=var2).grid(row=1, sticky=W)
9
10 mainloop()
11
```



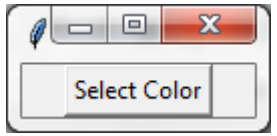
List Box

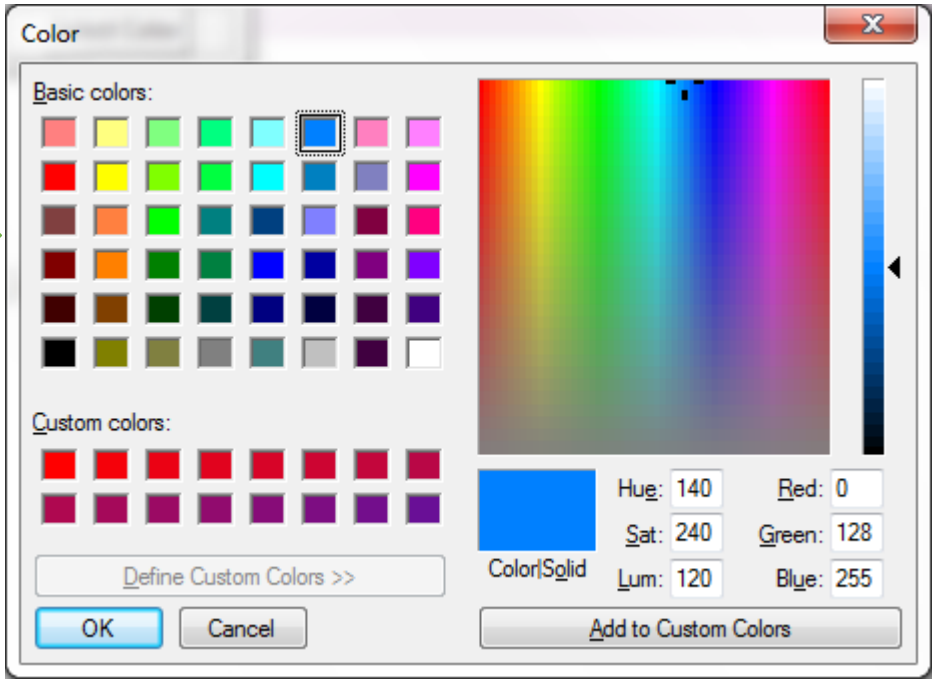

Spyder (Python 3.6)
File Edit Search Source Run Debug Consoles Projects Tools View Help
C:\Python\My Stuff
Editor - C:\Python\My Stuff\tk2.py
tk2.py tk1.py tk_1.py tk_2.py tk_3.py tk_4.py tk_5.py tk_6.py tk_7.py tk_8.py
1 from tkinter import * # Importing the Tkinter (tool box) library
2 root = Tk() # Create a background window
3 # Create a list
4 li = 'Carl Patrick Lindsay Helmut Chris Gwen'.split()
5 listb = Listbox(root) # Create a listbox widget
6 for item in li: # Insert each item within li into the listbox
7 listb.insert(0,item)
8
9 listb.pack() # Pack listbox widget
10 root.mainloop() # Execute the main event handler
Gwen
Chris
Helmut
Lindsay
Patrick
Carl

Color Dialog

```
1  from tkinter import *
2  from tkinter.colorchooser import *
3
4  def getColor():
5      color = askcolor()
6      print (color)
7
8  Button(text='Select Color', command=getColor).pack()
9
10 mainloop()
```

Output



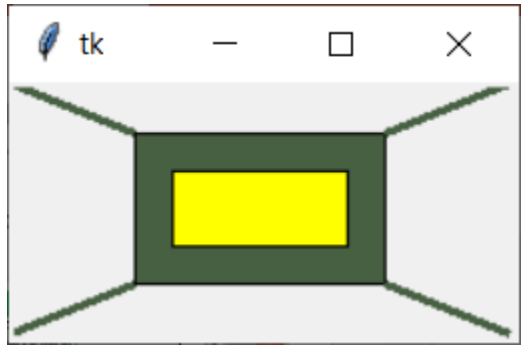


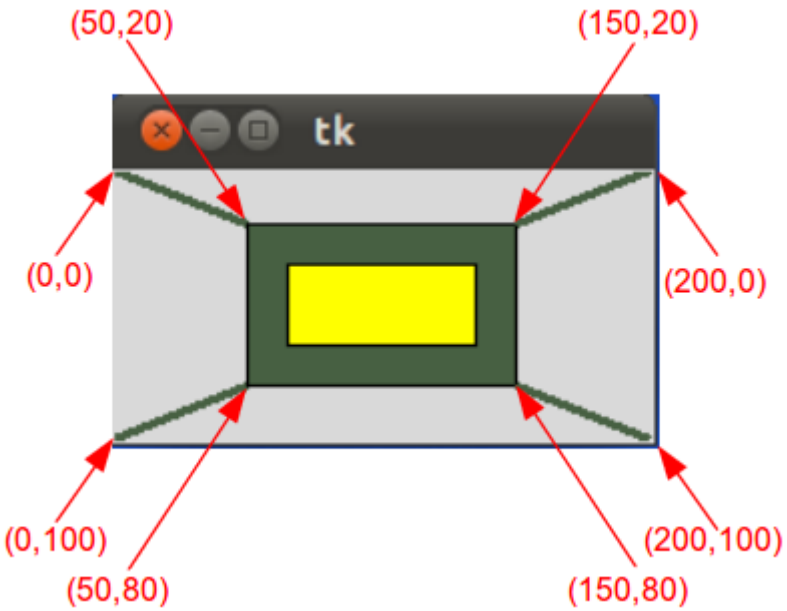

```
((255.99609375, 0.0, 0.0), '#ff0000')
```

http://knowpapa.com/cchoser/

Drawing

```python
from tkinter import *

master = Tk()

w = Canvas(master, width=200, height=100)
w.pack()

w.create_rectangle(50, 20, 150, 80, fill="#476042")
w.create_rectangle(65, 35, 135, 65, fill="yellow")
w.create_line(0, 0, 50, 20, fill="#476042", width=3)
w.create_line(0, 100, 50, 80, fill="#476042", width=3)
w.create_line(150,20, 200, 0, fill="#476042", width=3)
w.create_line(150, 80, 200, 100, fill="#476042", width=3)

mainloop()
```





Label in a Class

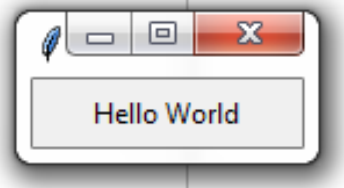
Spyder (Python 3.6)

File Edit Search Source Run Debug Consoles Projects Tools View Help

Editor - C:\Python\My Stuff\tk_2.py

tk1.py | tk_1.py | tk_2.py | tk_3.py | tk_4.py | tk_5.py | tk_6.py | tk_7.py | tk_8.py | tk_9.py

```
1  import tkinter as tk
2
3  class Root(tk.Tk):
4      def __init__(self):
5          super().__init__()
6
7          self.label = tk.Label(self, text="Hello World", padx=5, pady=5)
8
9          self.label.pack()
10
11 if __name__ == "__main__":
12     root = Root()
13     root.mainloop()
```



Master in Software Engineering

Hussam Hourani has over 25 years of Organizations Transformation, VROs, PMO, Large Scale and Enterprise Programs Global Delivery, Leadership, Business Development and Management Consulting. His client experience is wide ranging across many sectors but focuses on Performance Enhancement, Transformation, Enterprise Program Management, Artificial Intelligence and Data Science.