



Softronic Automation

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- n=5;
- for i in range(n,):
 - for j in range(i+1):
 - print('+',end=" \t")
 -
 - print("\n ")

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- `n=5;`
- `for i in range(n, 0,-1):`
- `for j in range(i, 0,-1):`
- `print('+',end=" \t")`
- `k+=1`
- `print("\n ")`

```
+      +      +      +      +
+      +      +      +
+      +      +
+      +
+
```



- k=65
- n=5;
- for i in range(0, n):
- for j in range(0, n):
- print(chr(k),end=" \t")
- k+=1
- print("\n ")

A	B	C	D	E
F	G	H	I	J
K	L	M	N	O
P	Q	R	S	T
U	V	W	X	Y





- k=1
- n=5;
- for i in range(0, n):
- for j in range(0, n):
- print(k, end=" \t")
- k+=1
- print(" \n")

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25





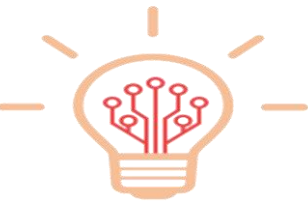
```
k=65
n=5;
for i in range(0, n):
    for j in range(0, i+1):
        print(chr(k),end=" \t")
        k+=1
    print("\n ")
```

A				
B	C			
D	E	F		
G	H	I	J	
K	L	M	N	O



- k=65
- n=5;
- for i in range(n, 0,-1):
- for j in range(i, 0,-1):
- print(chr(k),end=" \t")
- k+=1
- print("\n ")

A	B	C	D	E
F	G	H	I	
J	K	L		
M	N			
O				



```
k=2309
n=5;
for i in range(0, n):
    for j in range(0, i+1):
        print(chr(k),end=" \t")
        k+=1
    print("\n ")
```

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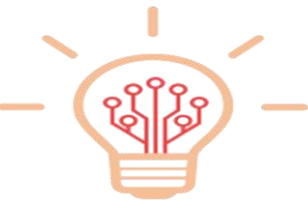
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```
k=2325
n=5;
for i in range(0, n):
    for j in range(0, i+1):
        print(chr(k),end=" \t")
        k+=1
    print("\n ")
```

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tkinter

- Python offers multiple options for developing GUI (Graphical User Interface).
- tkinter is the most commonly used method. It is a standard Python interface to the Tk GUI toolkit shipped with Python.
- Python with tkinter is the fastest and easiest way to create the GUI applications. Creating a GUI using tkinter is an easy task.



Softronic 
Automation

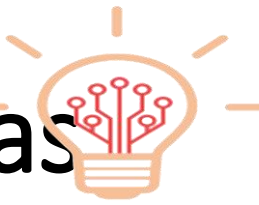


import tkinter

- Importing the module – tkinter
- Create the main window (container)
- Add any number of widgets to the main window
- Apply the event Trigger on the widgets.



Tk(screenName=None, baseName=None, className='Tk', useTk=1):



- To create a main window, tkinter offers a method 'Tk(screenName=None, baseName=None, className='Tk', useTk=1)'.
- To change the name of the window, you can change the className to the desired one. The basic code used to create the main window of the application is:
 - m=tkinter.Tk() where m is the name of the main window object





mainloop():

- There is a method known by the name `mainloop()` is used when your application is ready to run. `mainloop()` is an infinite loop used to run the application, wait for an event to occur and process the event as long as the window is not closed.
- `m.mainloop()`





code

```
import tkinter
m = tkinter.Tk()
'''
widgets are added here
'''

m.mainloop()
```



Geometric Configuration

- **pack() method:** It organizes the widgets in blocks before placing in the parent widget.
- **grid() method:** It organizes the widgets in grid (table-like structure) before placing in the parent widget.
- **place() method:** It organizes the widgets by placing them on specific positions directed by the programmer.

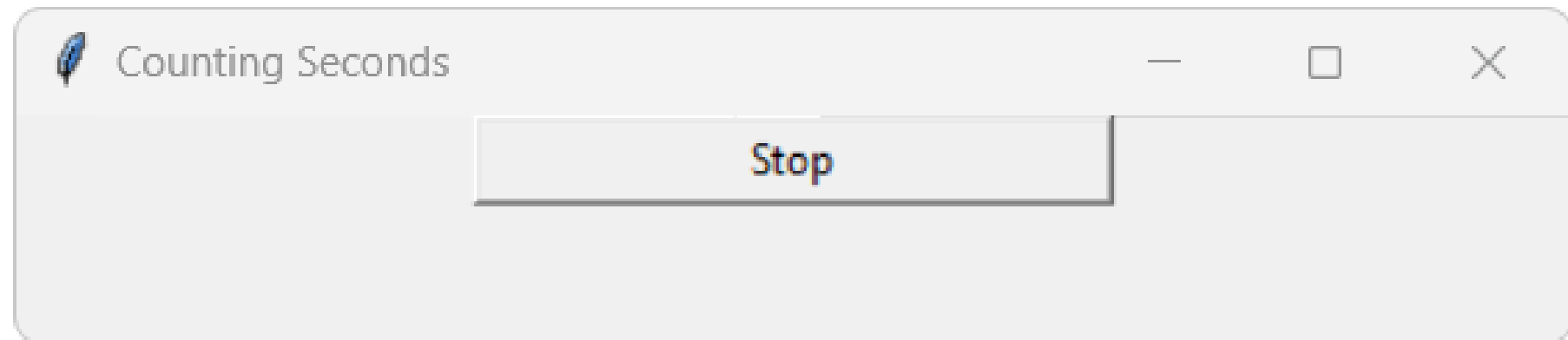


Button

- To add a button in your application, this widget is used.
The general syntax is:
- **w=Button(master, option=value)**
- **activebackground**: to set the background color when button is under the cursor.
- **activeforeground**: to set the foreground color when button is under the cursor.
- **bg**: to set the normal background color.
- **command**: to call a function.
- **font**: to set the font on the button label.
- **image**: to set the image on the button.
- **width**: to set the width of the button.
- **height**: to set the height of the button.



```
import tkinter as tk  
r = tk.Tk()  
r.title('Counting Seconds')  
button = tk.Button(r, text='Stop', width=25, command=r.destroy)  
button.pack()  
r.mainloop()
```





Label

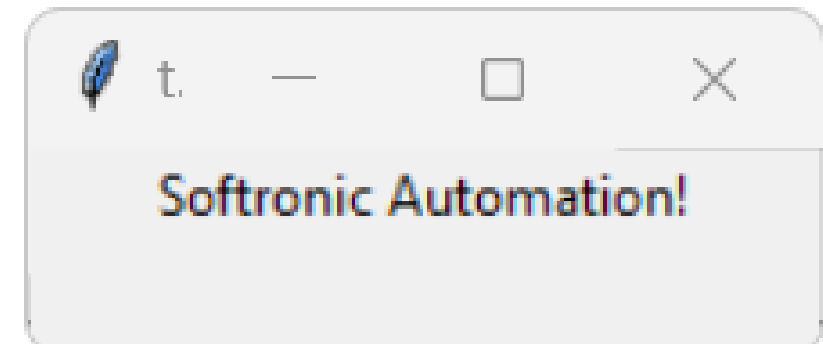
- It refers to the display box where you can put any text or image which can be updated any time as per the code. The general syntax is:

w=Label(master, option=value)

- master is the parameter used to represent the parent window.
- **bg**: to set the normal background color.
- **bg** to set the normal background color.
- **command**: to call a function.
- **font**: to set the font on the button label.
- **image**: to set the image on the button.
- **width**: to set the width of the button.
- **height**” to set the height of the button.



```
from tkinter import *  
root = Tk()  
w = Label(root, text='Softronic Automation!')  
w.pack()  
root.mainloop()
```



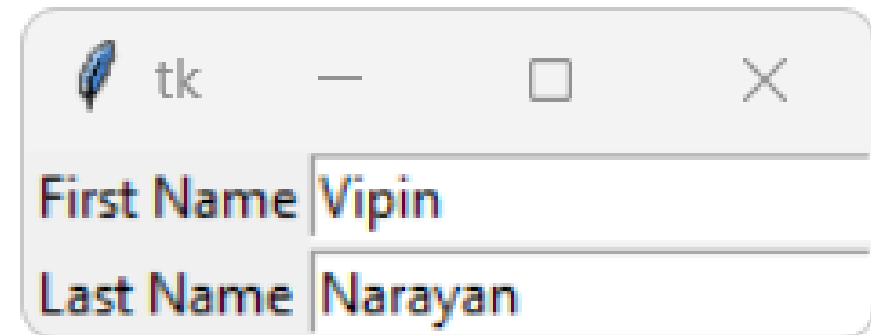


Entry

- It is used to input the single line text entry from the user.. For multi-line text input, Text widget is used. The general syntax is:
 - **w=Entry(master, option=value)**
- **bd:** to set the border width in pixels.
- **bg:** to set the normal background color.
- **cursor:** to set the cursor used.
- **command:** to call a function.
- **highlightcolor:** to set the color shown in the focus highlight.
- **width:** to set the width of the button.
- **height:** to set the height of the button.



```
from tkinter import *  
master = Tk()  
Label(master, text='First Name').grid(row=0)  
Label(master, text='Last Name').grid(row=1)  
e1 = Entry(master)  
e2 = Entry(master)  
e1.grid(row=0, column=1)  
e2.grid(row=1, column=1)  
mainloop()
```





Canvas

- It is used to draw pictures and other complex layout like graphics, text and widgets. The general syntax is:

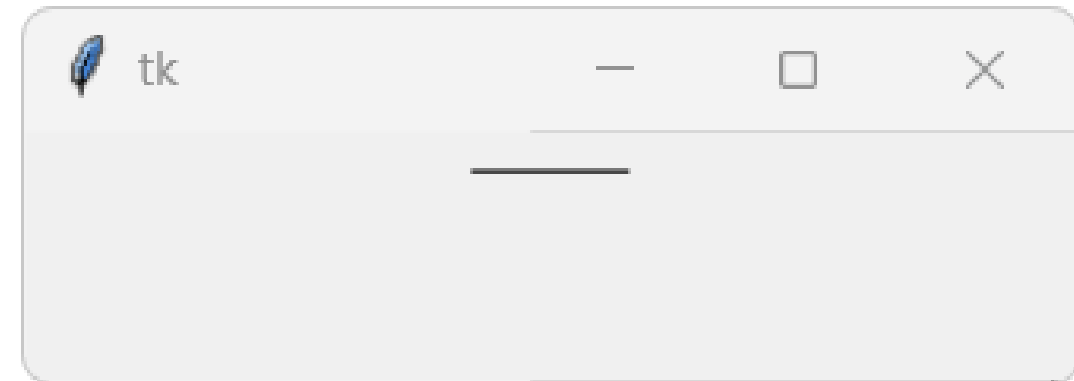
w = Canvas(master, option=value)

master is the parameter used to represent the parent window.

- **bd**: to set the border width in pixels.
- **bg**: to set the normal background color.
- **cursor**: to set the cursor used in the canvas.
- **highlightcolor**: to set the color shown in the focus highlight.
- **width**: to set the width of the widget.
- **height**: to set the height of the widget.



```
from tkinter import *  
master = Tk()  
w = Canvas(master, width=40, height=60)  
w.pack()  
canvas_height=20  
canvas_width=200  
y = int(canvas_height / 2)  
w.create_line(0, y, canvas_width, y )  
mainloop()
```



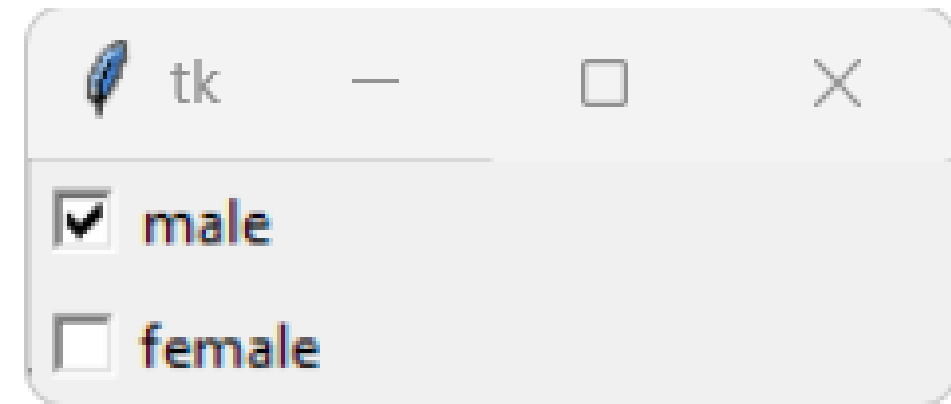


CheckBox:

- To select any number of options by displaying a number of options to a user as toggle buttons. The general syntax is:
 - **w = CheckBox(master, option=value)**
- **Title**: To set the title of the widget.
- **activebackground**: to set the background color when widget is under the cursor.
- **activeforeground**: to set the foreground color when widget is under the cursor.
- **bg**: to set the normal background color.
- **command**: to call a function.
- **font**: to set the font on the button label.
- **image**: to set the image on the widget.



```
from tkinter import *  
master = Tk()  
var1 = IntVar()  
Checkbutton(master, text='male', variable=var1).grid(row=0, sticky=W)  
var2 = IntVar()  
Checkbutton(master, text='female', variable=var2).grid(row=1,  
sticky=W)  
mainloop()
```





Frame

- It acts as a container to hold the widgets. It is used for grouping and organizing the widgets. The general syntax is:

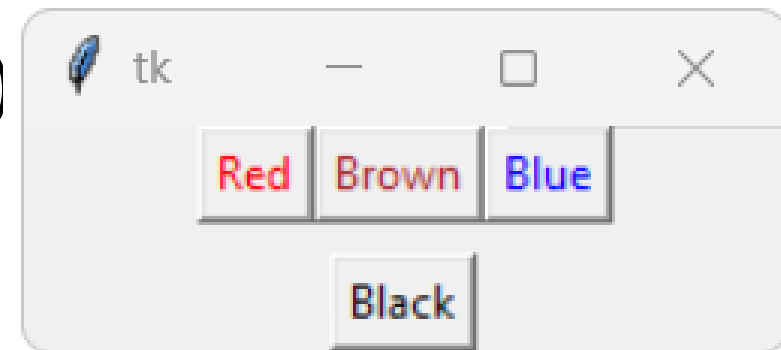
w = Frame(master, option=value)

master is the parameter used to represent the parent window.

- **highlightcolor**: To set the color of the focus highlight when widget has to be focused.
- **bd**: to set the border width in pixels.
- **bg**: to set the normal background color.
- **cursor**: to set the cursor used.
- **width**: to set the width of the widget.
- **height**: to set the height of the widget.



```
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()
```





Listbox

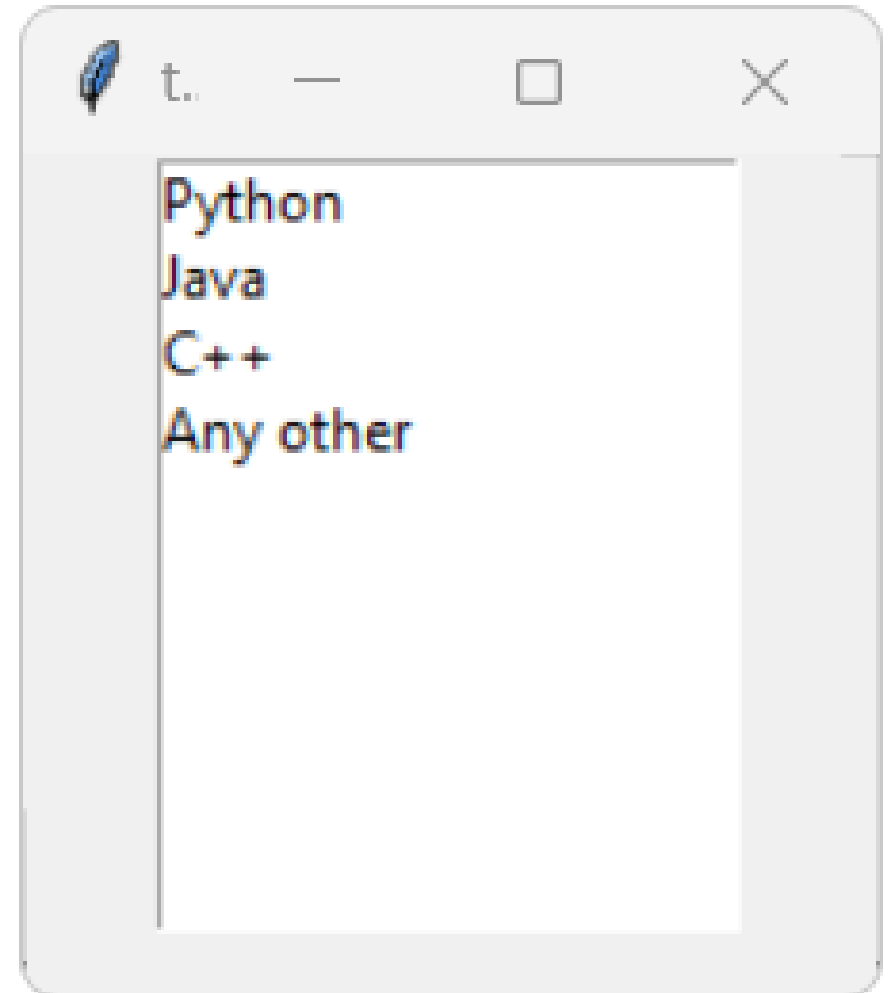
- It offers a list to the user from which the user can accept any number of options. The general syntax is:

w = Listbox(master, option=value)

- **highlightcolor**: To set the color of the focus highlight when widget has to be focused.
- **bg**: to set the normal background color.
- **bd**: to set the border width in pixels.
- **font**: to set the font on the button label.
- **image**: to set the image on the widget.
- **width**: to set the width of the widget.
- **height**: to set the height of the widget.



```
from tkinter import *  
top = Tk()  
Lb = Listbox(top)  
Lb.insert(1, 'Python')  
Lb.insert(2, 'Java')  
Lb.insert(3, 'C++')  
Lb.insert(4, 'Any other')  
Lb.pack()  
top.mainloop()
```



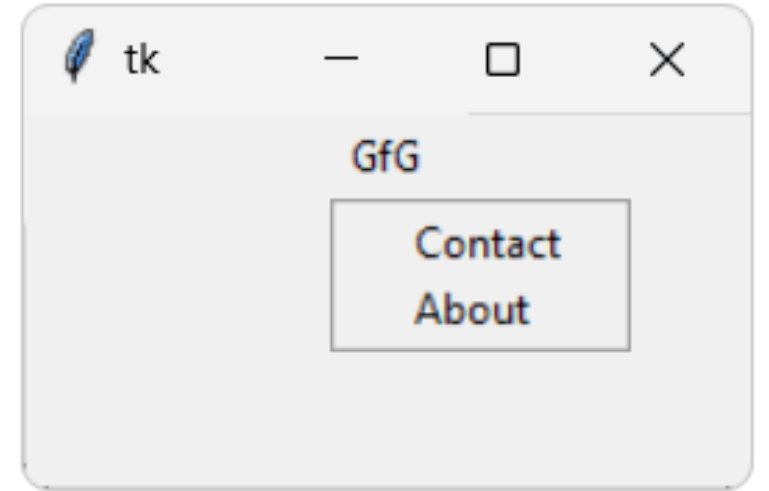
MenuButton



- It is a part of top-down menu which stays on the window all the time. Every menubutton has its own functionality. The general syntax is:
 - **w = MenuButton(master, option=value)**
- **activebackground**: To set the background when mouse is over the widget.
- **activeforeground**: To set the foreground when mouse is over the widget.
- **bg**: to set the normal background color.
- **bd**: to set the size of border around the indicator.
- **cursor**: To appear the cursor when the mouse over the menubutton.
- **image**: to set the image on the widget.
- **width**: to set the width of the widget.
- **height**: to set the height of the widget.
- **highlightcolor**: To set the color of the focus highlight when widget has to be focused.



```
from tkinter import *
top = Tk()
mb = Menubutton ( top, text = "GfG")
mb.grid()
mb.menu = Menu ( mb, tearoff = 0 )
mb["menu"] = mb.menu
cVar = IntVar()
aVar = IntVar()
mb.menu.add_checkbutton ( label = 'Contact', variable = cVar )
mb.menu.add_checkbutton ( label = 'About', variable = aVar )
mb.pack()
top.mainloop()
```

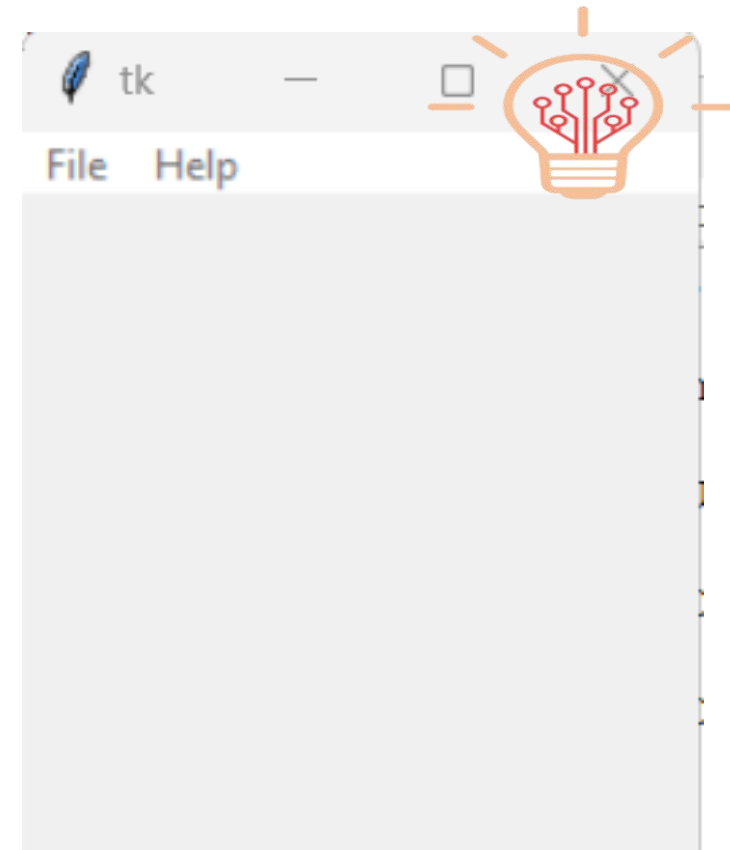


Menu



- It is used to create all kinds of menus used by the application.
The general syntax is:
 - **w = Menu(master, option=value)**
- **title**: To set the title of the widget.
- **activebackground**: to set the background color when widget is under the cursor.
- **activeforeground**: to set the foreground color when widget is under the cursor.
- **bg**: to set the normal background color.
- **command**: to call a function.
- **font**: to set the font on the button label.
- **image**: to set the image on the widget.

```
from tkinter import *
root = Tk()
menu = Menu(root)
root.config(menu=menu)
filemenu = Menu(menu)
menu.add_cascade(label='File', menu=filemenu)
filemenu.add_command(label='New')
filemenu.add_command(label='Open...')
filemenu.add_separator()
filemenu.add_command(label='Exit', command=root.quit)
helpmenu = Menu(menu)
menu.add_cascade(label='Help', menu=helpmenu)
helpmenu.add_command(label='About')
mainloop()
```



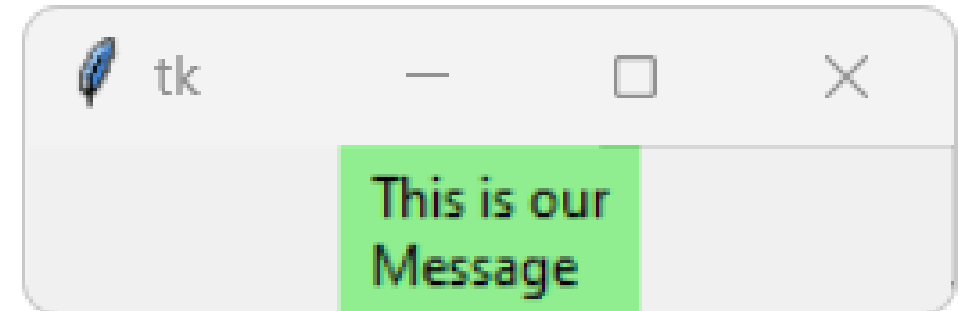


Message

- It refers to the multi-line and non-editable text. It works same as that of Label.
 - **w = Message(master, option=value)**
- **bd**: to set the border around the indicator.
- **bg**: to set the normal background color.
- **font**: to set the font on the button label.
- **image**: to set the image on the widget.
- **width**: to set the width of the widget.
- **height**: to set the height of the widget.



```
from tkinter import *  
main = Tk()  
ourMessage = 'This is our Message'  
messageVar = Message(main, text = ourMessage)  
messageVar.config(bg='lightgreen')  
messageVar.pack( )  
main.mainloop( )
```



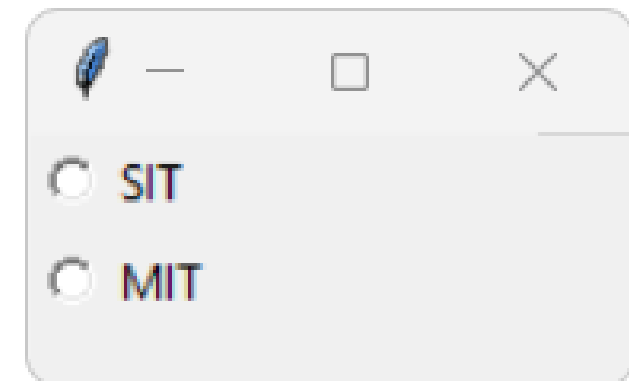
RadioButton:



- It is used to offer multi-choice option to the user. It offers several options to the user and the user has to choose one option.
 - **w = RadioButton(master, option=value)**
- **activebackground**: to set the background color when widget is under the cursor.
- **activeforeground**: to set the foreground color when widget is under the cursor.
- **bg**: to set the normal background color.
- **command**: to call a function.
- **font**: to set the font on the button label.
- **image**: to set the image on the widget.
- **width**: to set the width of the label in characters.
- **height**: to set the height of the label in characters.



- `from tkinter import *`
- `root = Tk()`
- `v = IntVar()`
- `Radiobutton(root, text='GfG', variable=v, value=1).pack(anchor=W)`
- `Radiobutton(root, text='MIT', variable=v, value=2).pack(anchor=W)`
- `mainloop()`



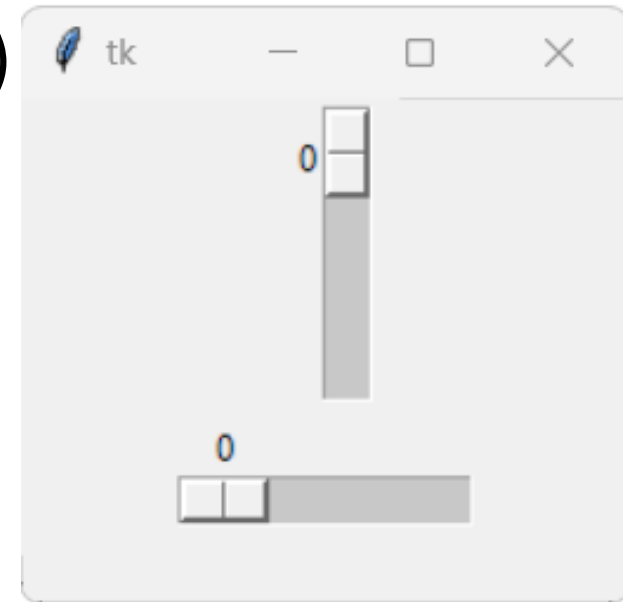
Scale



- It is used to provide a graphical slider that allows to select any value from that scale.
 - **w = Scale(master, option=value)**
- **cursor**: To change the cursor pattern when the mouse is over the widget.
- **activebackground**: To set the background of the widget when mouse is over the widget.
- **bg**: to set the normal background color.
- **orient**: Set it to HORIZONTAL or VERTICAL according to the requirement.
- **from_**: To set the value of one end of the scale range.
- **to**: To set the value of the other end of the scale range.
- **image**: to set the image on the widget.
- **width**: to set the width of the widget.



```
from tkinter import *  
master = Tk()  
w = Scale(master, from_=0, to=42)  
w.pack()  
w = Scale(master, from_=0, to=200, orient=HORIZONTAL)  
w.pack()  
mainloop()
```



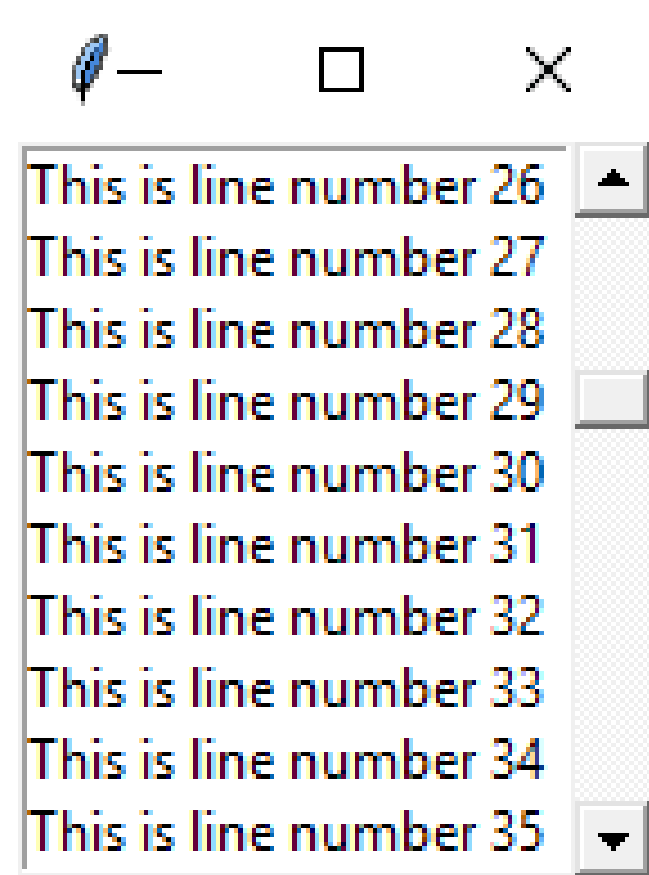


Scrollbar

- It refers to the slide controller which will be used to implement listed widgets.
 - **w = Scrollbar(master, option=value)**
- **width**: to set the width of the widget.
- **activebackground**: To set the background when mouse is over the widget.
- **bg**: to set the normal background color.
- **bd**: to set the size of border around the indicator.
- **cursor**: To appear the cursor when the mouse over the menubutton.



```
from tkinter import *  
root = Tk()  
scrollbar = Scrollbar(root)  
scrollbar.pack( side = RIGHT, fill = Y )  
mylist = Listbox(root, yscrollcommand = scrollbar.set )  
for line in range(100):  
    mylist.insert(END, 'This is line number' + str(line))  
mylist.pack( side = LEFT, fill = BOTH )  
scrollbar.config( command = mylist.yview )  
mainloop()
```





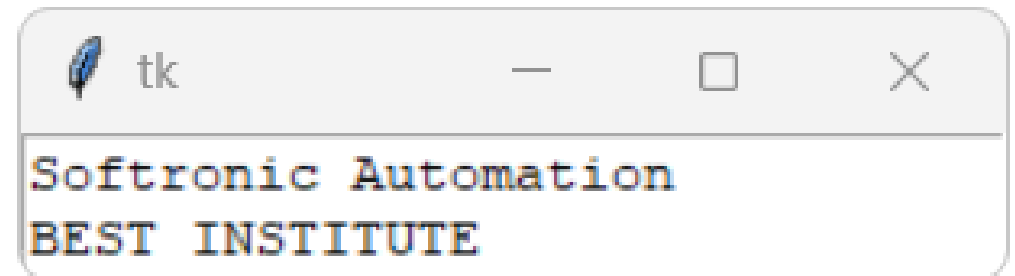
Text

- To edit a multi-line text and format the way it has to be displayed.
 - **w =Text(master, option=value)**
- **highlightcolor**: To set the color of the focus highlight when widget has to be focused.
- **insertbackground**: To set the background of the widget.
- **bg**: to set the normal background color.
- **font**: to set the font on the button label.
- **image**: to set the image on the widget.
- **width**: to set the width of the widget.
- **height**: to set the height of the widget.





```
from tkinter import *  
root = Tk()  
T = Text(root, height=2, width=30)  
T.pack()  
T.insert(END, 'Softronic Automation\nBEST INSTITUTE\n')  
mainloop()
```





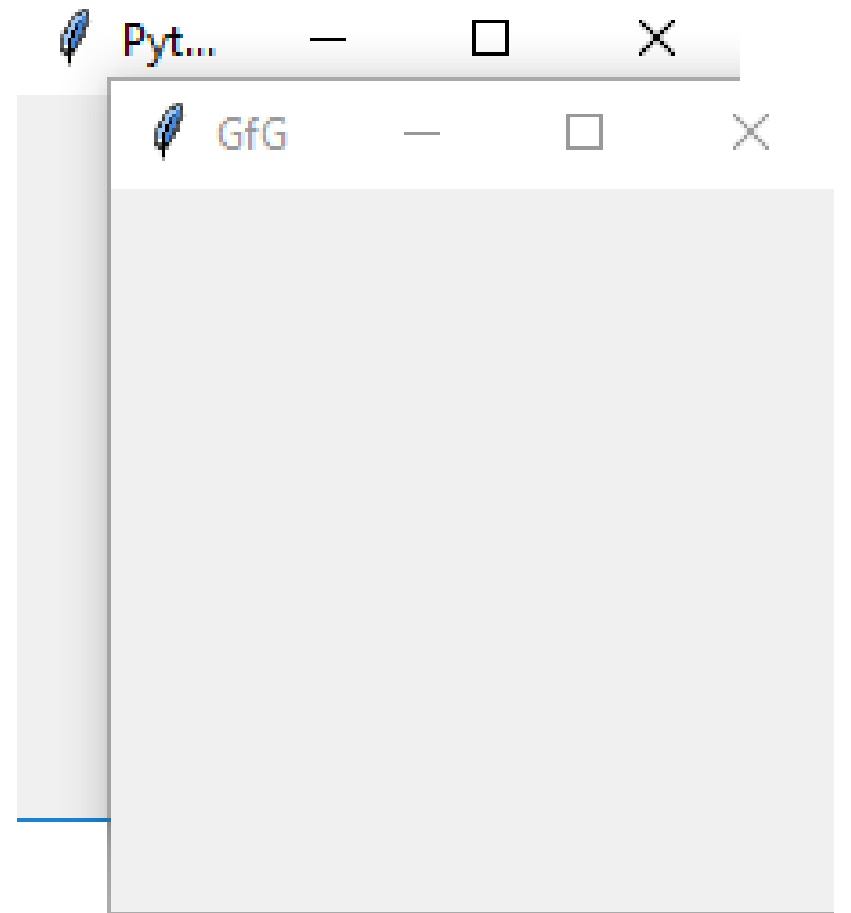
TopLevel

- This widget is directly controlled by the window manager. It don't need any parent window to work on.
 - **w = TopLevel(master, option=value)**
- **bg**: to set the normal background color.
- **bd**: to set the size of border around the indicator.
- **cursor**: To appear the cursor when the mouse over the menubutton.
- **width**: to set the width of the widget.
- **height**: to set the height of the widget.





```
from tkinter import *  
root = Tk()  
root.title('SA')  
top = Toplevel()  
top.title('Python')  
top.mainloop()
```



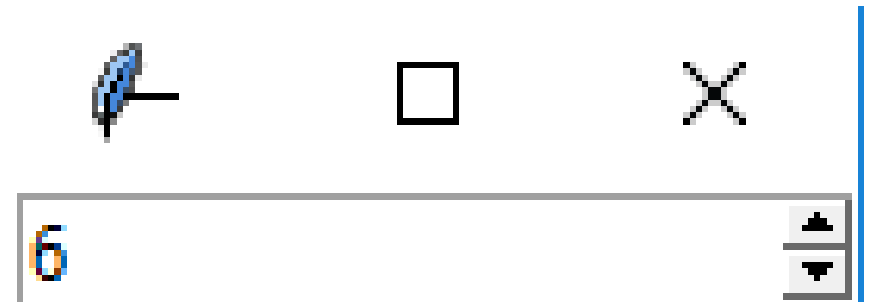
SpinBox



- It is an entry of 'Entry' widget. Here, value can be input by selecting a fixed value of numbers.
 - **w = SpinBox(master, option=value)**
- **bg**: to set the normal background color.
- **bd**: to set the size of border around the indicator.
- **cursor**: To appear the cursor when the mouse over the menubutton.
- **command**: To call a function.
- **width**: to set the width of the widget.
- **activebackground**: To set the background when mouse is over the widget.
- **disabledbackground**: To disable the background when mouse is over the widget.
- **from_**: To set the value of one end of the range.
- **to**: To set the value of the other end of the range.



```
from tkinter import *  
master = Tk()  
w = Spinbox(master, from_ = 0, to = 10)  
w.pack()  
mainloop()
```





PannedWindow

- It is a container widget which is used to handle number of panes arranged in it.
 - **w = PannedWindow(master, option=value)**
- **bg**: to set the normal background color.
- **bd**: to set the size of border around the indicator.
- **cursor**: To appear the cursor when the mouse over the menubutton.
- **width**: to set the width of the widget.
- **height**: to set the height of the widget.





```
from tkinter import *  
m1 = PanedWindow()  
m1.pack(fill = BOTH, expand = 1)  
left = Entry(m1, bd = 5)  
m1.add(left)  
m2 = PanedWindow(m1, orient = VERTICAL)  
m1.add(m2)  
top = Scale( m2, orient = HORIZONTAL)  
m2.add(top)  
mainloop()
```

