Python GUI – tkinter

To create a tkinter app:

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

```
import tkinter
```

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.

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

tkinter also offers access to the geometric configuration of the widgets which can organize the widgets in the parent windows. There are mainly three geometry manager classes class.

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

There are a number of widgets which you can put in your tkinter application. Some of the major widgets are explained below:

Button:To add a button in your application, this widget is used.
The general syntax is:

```
w=Button(master, option=value)
```

```
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()
```

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.

```
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()
```

CheckButton: To select any number of options by displaying a number of options to a user as toggle buttons. The general syntax is:

```
w = CheckButton(master, option=value)
```

```
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()
```

Entry: It is used to input the single line text entry from the user.. For multi-line text input, Text widget is used.

```
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()
```

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.

```
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()
```

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.`

```
from tkinter import *
root = Tk()
w = Label(root, text='GeeksForGeeks.org!')
w.pack()
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)`

`master is the parameter used to represent the parent window.`

```
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)`

`master is the parameter used to represent the parent window.`

```
from tkinter import *


top = Tk()
mb =  Menubutton ( top, text = &amp;quot;GfG&amp;quot;)
mb.grid()
mb.menu  =  Menu ( mb, tearoff = 0 )
mb[&amp;quot;menu&amp;quot;]  =  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)`

`master is the parameter used to represent the parent window.`

```
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)`

`master is the parameter used to represent the parent window.`

```
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.
The general syntax is:
`w = RadioButton(master, option=value)`

```
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()
```

Text: To edit a multi-line text and format the way it has to be displayed. The general syntax is:

```
w  =Text(master, option=value)
```

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