Python GUI – Tkinter

- **To Create A Tkinter Python 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.

❖ **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.

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:

1. **Button**: To add a button in your application, this widget is used.
   - **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.

2. **Canvas:** It is used to **draw pictures and other complex layout like graphics,** text and widgets.
   - **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.

3. **CheckButton:** To select any number of options by displaying a number of options to a user as toggle buttons.

- **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.

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

5. **Frame:** It acts as a container to hold the widgets. It is used for grouping and organizing the widgets.
   - **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.

6. **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.
   - **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.

7. **Listbox**: It offers a list to the user from which the user can accept any number of options.

8. **MenuButton**: It is a part of top-down menu which stays on the window all the time. Every menubutton has its own functionality.

9. **Menu**: It is used to create all kinds of menus used by the application.

10. **Message**: It refers to the multi-line and non-editable text. It works same as that of Label.

11. **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.

12. **Scale:** It is used to provide a graphical slider that allows to select any value from that scale.
   - **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

13. **Scrollbar**: It refers to the slide controller which will be used to implement listed widgets.

14. **Text:** To edit a multi-line text and format the way it has to be displayed.
    - **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.

15. **TopLevel:** This widget is directly controlled by the window manager. It don't need any parent window to work on.

16. **SpinBox:** It is an entry of 'Entry' widget. Here, value can be input by selecting a fixed value of numbers.

    - **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.

17. **PannedWindow**It is a container widget which is used to handle number of panes arranged in it.