Python GUI PROGRAMMING

Python provides various options for developing graphical user interfaces GUIs. Most important are listed below.

- **Tkinter**: Tkinter is the Python interface to the Tk GUI toolkit shipped with Python. We would look this option in this chapter.

- **wxPython**: This is an open-source Python interface for wxWindows [http://wxpython.org](http://wxpython.org).

- **JPython**: JPython is a Python port for Java which gives Python scripts seamless access to Java class libraries on the local machine [http://www.jython.org](http://www.jython.org).

There are many other interfaces available, which you can find them on the net.

**Tkinter Programming**

Tkinter is the standard GUI library for Python. Python when combined with Tkinter provides a fast and easy way to create GUI applications. Tkinter provides a powerful object-oriented interface to the Tk GUI toolkit.

Creating a GUI application using Tkinter is an easy task. All you need to do is perform the following steps –

- Import the Tkinter module.
- Create the GUI application main window.
- Add one or more of the above-mentioned widgets to the GUI application.
- Enter the main event loop to take action against each event triggered by the user.

**Example**

```python
#!/usr/bin/python

import Tkinter

# Code to add widgets will go here...
top = Tkinter.Tk()
top.mainloop()
```

This would create a following window –

![Tkinter Window](attachment:image.png)

**Tkinter Widgets**

Tkinter provides various controls, such as buttons, labels and text boxes used in a GUI application. These controls are commonly called widgets.
There are currently 15 types of widgets in Tkinter. We present these widgets as well as a brief description in the following table:

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Button</strong></td>
<td>The Button widget is used to display buttons in your application.</td>
</tr>
<tr>
<td><strong>Canvas</strong></td>
<td>The Canvas widget is used to draw shapes, such as lines, ovals, polygons and rectangles, in your application.</td>
</tr>
<tr>
<td><strong>Checkbutton</strong></td>
<td>The Checkbutton widget is used to display a number of options as checkboxes. The user can select multiple options at a time.</td>
</tr>
<tr>
<td><strong>Entry</strong></td>
<td>The Entry widget is used to display a single-line text field for accepting values from a user.</td>
</tr>
<tr>
<td><strong>Frame</strong></td>
<td>The Frame widget is used as a container widget to organize other widgets.</td>
</tr>
<tr>
<td><strong>Label</strong></td>
<td>The Label widget is used to provide a single-line caption for other widgets. It can also contain images.</td>
</tr>
<tr>
<td><strong>Listbox</strong></td>
<td>The Listbox widget is used to provide a list of options to a user.</td>
</tr>
<tr>
<td><strong>Menubutton</strong></td>
<td>The Menubutton widget is used to display menus in your application.</td>
</tr>
<tr>
<td><strong>Menu</strong></td>
<td>The Menu widget is used to provide various commands to a user. These commands are contained inside Menubutton.</td>
</tr>
<tr>
<td><strong>Message</strong></td>
<td>The Message widget is used to display multiline text fields for accepting values from a user.</td>
</tr>
<tr>
<td><strong>Radiobutton</strong></td>
<td>The Radiobutton widget is used to display a number of options as radio buttons. The user can select only one option at a time.</td>
</tr>
<tr>
<td><strong>Scale</strong></td>
<td>The Scale widget is used to provide a slider widget.</td>
</tr>
<tr>
<td><strong>Scrollbar</strong></td>
<td>The Scrollbar widget is used to add scrolling capability to various widgets, such as list boxes.</td>
</tr>
<tr>
<td><strong>Text</strong></td>
<td>The Text widget is used to display text in multiple lines.</td>
</tr>
<tr>
<td><strong>Toplevel</strong></td>
<td>The Toplevel widget is used to provide a separate window container.</td>
</tr>
<tr>
<td><strong>Spinbox</strong></td>
<td>The Spinbox widget is a variant of the standard Tkinter Entry widget, which can be used to select from a fixed number of values.</td>
</tr>
</tbody>
</table>
**PanedWindow**

A PanedWindow is a container widget that may contain any number of panes, arranged horizontally or vertically.

**LabelFrame**

A labelframe is a simple container widget. Its primary purpose is to act as a spacer or container for complex window layouts.

**tkMessageBox**

This module is used to display message boxes in your applications.

Let us study these widgets in detail –

**Standard attributes**

Let us take a look at how some of their common attributes.such as sizes, colors and fonts are specified.

- **Dimensions**
- **Colors**
- **Fonts**
- **Anchors**
- **Relief styles**
- **Bitmaps**
- **Cursors**

Let us study them briefly –

**Geometry Management**

All Tkinter widgets have access to specific geometry management methods, which have the purpose of organizing widgets throughout the parent widget area. Tkinter exposes the following geometry manager classes: pack, grid, and place.

- **The pack Method** - This geometry manager organizes widgets in blocks before placing them in the parent widget.
- **The grid Method** - This geometry manager organizes widgets in a table-like structure in the parent widget.
- **The place Method** - This geometry manager organizes widgets by placing them in a specific position in the parent widget.

Let us study the geometry management methods briefly –