GUI Using Python

- Recommended Version: 2.7 or latest
- Source :

http://www.tutorialspoint.com/python/python_gui_programming.htm

- **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
- **JPython:** JPython is a Python port for Java which gives Python scripts seamless access to Java class libraries on the local machine

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.

- Program1

```
#!/usr/bin/python

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

Tkinter Widgets

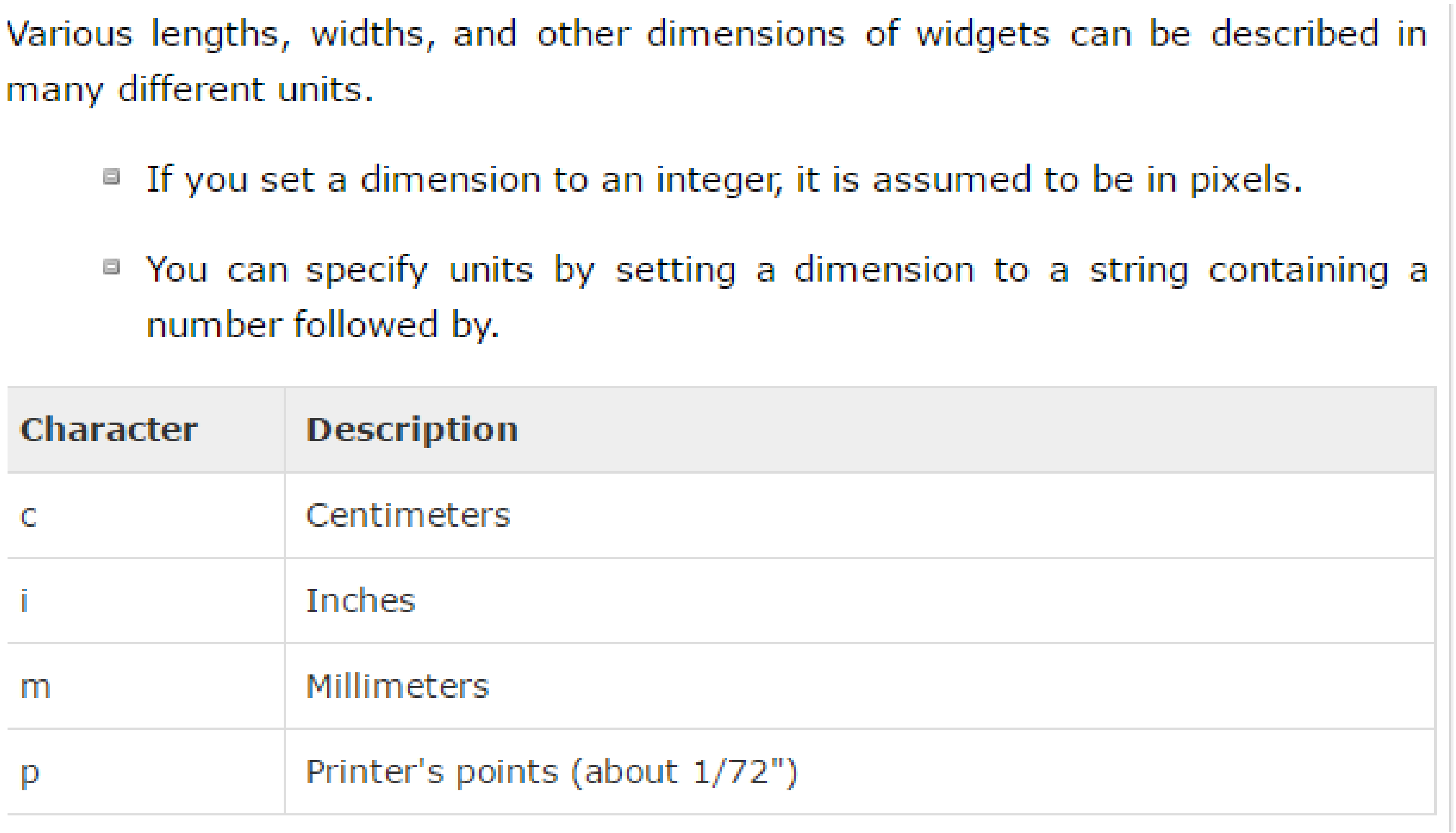
- Tkinter provides various controls, such as buttons, labels and text boxes used in a GUI application. These controls are commonly called widgets.
- There are currently 15 types of widgets in Tkinter. We present these widgets as well as a brief description in the following table −

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

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

Dimensions

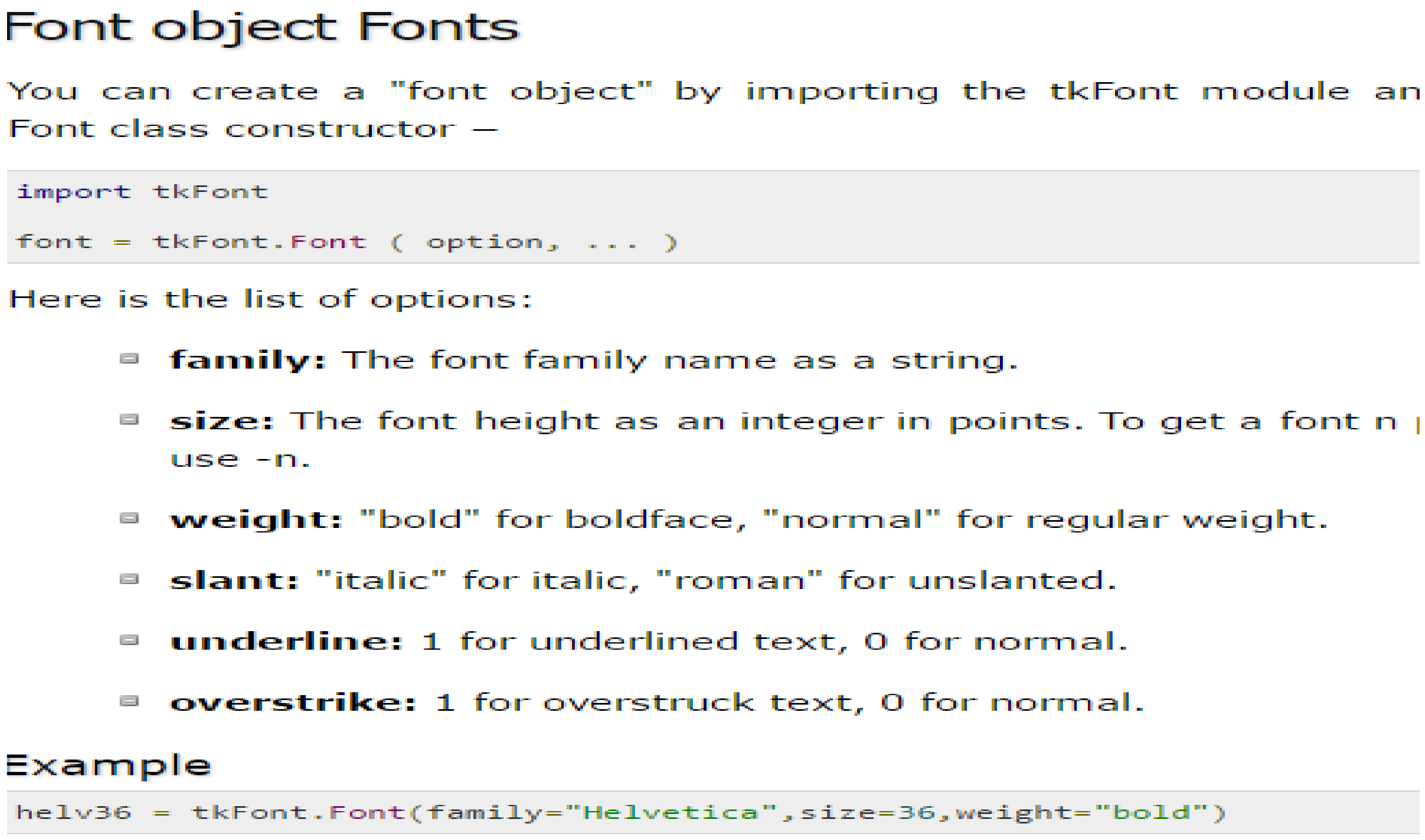


Various lengths, widths, and other dimensions of widgets can be described in many different units.

- If you set a dimension to an integer, it is assumed to be in pixels.
- You can specify units by setting a dimension to a string containing a number followed by.

Character	**Description**
c	Centimeters
i	Inches
m	Millimeters
p	Printer's points (about 1/72")

Fonts



Font object Fonts

You can create a "font object" by importing the tkFont module an
Font class constructor −

```
import tkFont

font = tkFont.Font ( option, ... )
```

Here is the list of options:

- **family:** The font family name as a string.
- **size:** The font height as an integer in points. To get a font n
  use -n.
- **weight:** "bold" for boldface, "normal" for regular weight.
- **slant:** "italic" for italic, "roman" for unslanted.
- **underline:** 1 for underlined text, 0 for normal.
- **overstrike:** 1 for overstruck text, 0 for normal.

Example

```
helv36 = tkFont.Font(family="Helvetica",size=36,weight="bold")
```

Relief Styles

Here is list of possible constants which can be used for relief attribute.

- FLAT
- RAISED
- SUNKEN
- GROOVE
- RIDGE

Example

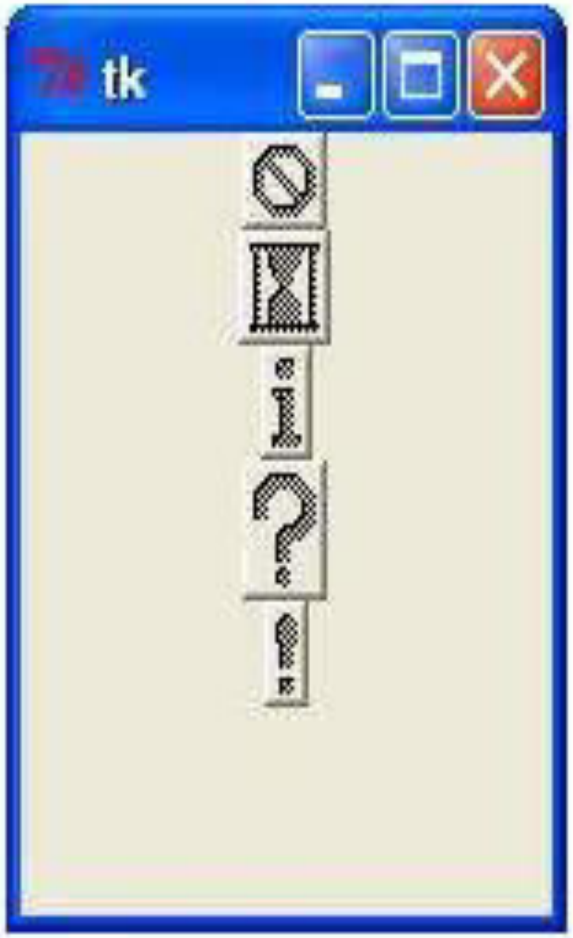
```
from Tkinter import *
import Tkinter

top = Tkinter.Tk()

B1 = Tkinter.Button(top, text ="FLAT", relief=FLAT )
B2 = Tkinter.Button(top, text ="RAISED", relief=RAISED )
B3 = Tkinter.Button(top, text ="SUNKEN", relief=SUNKEN )
B4 = Tkinter.Button(top, text ="GROOVE", relief=GROOVE )
B5 = Tkinter.Button(top, text ="RIDGE", relief=RIDGE )

B1.pack()
B2.pack()
B3.pack()
B4.pack()
B5.pack()
```

BIT MAPS



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.

Button

- Program2

```
import Tkinter
import tkMessageBox
top = Tkinter.Tk()
def helloCallBack():
 tkMessageBox.showinfo( "Hello Python", "Hello World")
 B = Tkinter.Button(top, text ="Hello", command = helloCallBack)
 B.pack()
top.mainloop()
```

Canvas

- The Canvas is a rectangular area intended for drawing pictures or other complex layouts. You can place graphics, text, widgets or frames on a Canvas.
- program3

```
import Tkinter
import tkMessageBox

top = Tkinter.Tk()

C = Tkinter.Canvas(top, bg="blue", height=250,
width=300)
coord = 10, 50, 240, 210
arc = C.create_arc(coord, start=0, extent=150, fill="red")
C.pack()
top.mainloop()
```

arc . Creates an arc item, which can be a chord, a pieslice or a simple arc.

```
coord = 10, 50, 240, 210
arc = canvas.create_arc(coord, start=0, extent=150, fill="blue")
```

image . Creates an image item, which can be an instance of either the BitmapImage or the PhotoImage classes.

```
filename = PhotoImage(file = "sunshine.gif")
image = canvas.create_image(50, 50, anchor=NE, image=filename)
```

line . Creates a line item.

```
line = canvas.create_line(x0, y0, x1, y1, ..., xn, yn, options)
```

oval . Creates a circle or an ellipse at the given coordinates. It takes two pairs of coordinates; the top left and bottom right corners of the bounding rectangle for the oval.

```
oval = canvas.create_oval(x0, y0, x1, y1, options)
```

polygon . Creates a polygon item that must have at least three vertices.

```
oval = canvas.create_polygon(x0, y0, x1, y1,...xn, yn, options)
```

Entry

- program4

```
from Tkinter import *

top = Tk()
L1 = Label(top, text="User Name")
L1.pack( side = LEFT)
E1 = Entry(top, bd =5)
E1.pack(side = RIGHT)

top.mainloop()
```

Frame

- program5

```
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

- Program6

```
from Tkinter import *
import tkMessageBox
import Tkinter

top = Tk()

Lb1 = Listbox(top)
Lb1.insert(1, "Python")
Lb1.insert(2, "Perl")
Lb1.insert(3, "C")
Lb1.insert(4, "PHP")
Lb1.insert(5, "JSP")
Lb1.insert(6, "Ruby")

Lb1.pack()
top.mainloop()
```

Radiobutton

- program7

```
from Tkinter import *

def sel():
   selection = "You selected the option " + str(var.get())
   label.config(text = selection)

root = Tk()
var = IntVar()
R1 = Radiobutton(root, text="Option 1", variable=var,
value=1, command=sel)
R1.pack( anchor = W )

R2 = Radiobutton(root, text="Option 2", variable=var,
value=2, command=sel)
R2.pack( anchor = W )

R3 = Radiobutton(root, text="Option 3", variable=var,
value=3, command=sel)
R3.pack( anchor = W)

label = Label(root)
label.pack()
root.mainloop()
```

Menubutton

- program8

```
from Tkinter import *
import tkMessageBox
import Tkinter
top = Tk()
mb=  Menubutton ( top, text="condiments“,relief=RAISED )
mb.grid()
mb.menu  =  Menu ( mb, tearoff = 0 )
mb["menu"]  =  mb.menu

mayoVar  = IntVar()
ketchVar = IntVar()

mb.menu.add_checkbutton ( label="mayo",
                          variable=mayoVar )
mb.menu.add_checkbutton ( label="ketchup",
                          variable=ketchVar )

mb.pack()
top.mainloop()
```

Check button

program9

```
from Tkinter import *
import tkMessageBox
import Tkinter

top = Tkinter.Tk()
CheckVar1 = IntVar()
CheckVar2 = IntVar()
C1 = Checkbutton(top, text = "Music", variable = CheckVar1,
onvalue = 1, offvalue = 0, height=5,  width = 20)
C2 = Checkbutton(top, text = "Video", variable = CheckVar2,
onvalue = 1, offvalue = 0, height=15, width = 50)
C1.pack()
C2.pack()
top.mainloop()
```

Bring Image

Program

```
# Putting a gif image on a canvas with Tkinter

from Tkinter import *
root=Tk()
    # create the canvas, size in pixels
canvas = Canvas(width = 300, height = 200, bg = 'yellow')
    # pack the canvas into a frame/form
canvas.pack(expand = YES, fill = BOTH)
    # load the .gif image file
    # put in your own gif file here, may need to add full path
gif1 = PhotoImage(file = 'dw.gif')
    # put gif image on canvas
  # pic's upper left corner (NW) on the canvas is at x=50 y=10
canvas.create_image(50, 10, image = gif1, anchor = NW)
    # run it ...
root.mainloop()
```

sqlite3 — DB-API 2.0 interface for SQLite databases

- SQLite is a C library that provides a lightweight disk-based database that doesn’t require a separate server process and allows accessing the database using a nonstandard variant of the SQL query language.
- Some applications can use SQLite for internal data storage.

Example 1 to crate table and insert

Program 10

```
import sqlite3
conn = sqlite3.connect('example.db')
c = conn.cursor()
# Create table
c.execute(“””CREATE TABLE student (name text, address text, age real,
    mobileno text)”””)
 # Insert a row of data
c.execute("INSERT INTO student VALUES ( ‘sanjay’,’lpu’,29,’9592411565’)")
# Save (commit) the changes
conn.commit()
# We can also close the connection if we are done with it.
 # Just be sure any changes have been committed or they will be lost.
conn.close()
```

Example 2 Access DB

Program 11

```
import sqlite3
conn = sqlite3.connect('example.db')
c = conn.cursor()
c.execute('SELECT * FROM student ‘)
print c.fetchone()
```

Example 3 insert list

Program12

```
import sqlite3
conn = sqlite3.connect('example.db')
c = conn.cursor()
list1 = [('abc','add1',25,'23456'),
        ('abc','add1',25,'23456'),
        ('abc','add1',25,'23456'),
        ]
c.executemany('INSERT INTO student VALUES (?,?,?,?)', list1)

for row in c.execute('SELECT * FROM student'):
        print row
```

Thank You !!!