Python GUI – tkinter

Python offers multiple optior terface). Out of all the GUI methods, tkinter is the most c d 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.

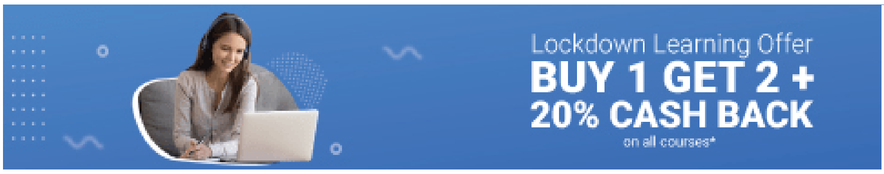
To create a tkinter app:

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

Importing tkinter is same as importing any other module in the Python code. Note that the name of the module in Python 2.x is ‘Tkinter’ and in Python 3.x it is ‘tkinter’.

```
import tkinter
```

There are two main methods used which the user needs to remember while creating the Python application with GUI.



1. **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
   ```

2. **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()
   ```

```
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:

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

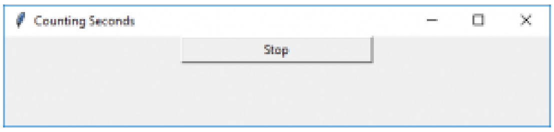
   ```
   w=Button(master, option=value)
   ```

   master is the parameter used to represent the parent window.
   There are number of options which are used to change the format of the Buttons. Number of options can be passed as parameters separated by commas. Some of them are listed below.

   - **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 he 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()
   ```

   Output:



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

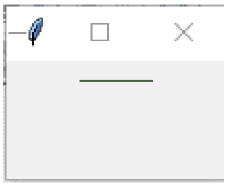
   ```
   w = Canvas(master, option=value)
   master is the parameter used to represent the parent window.
   ```

There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **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()
```

Output:



3. **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)
```

There are number of options which are used to change the format of this widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **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 he normal backgrouSteganography

  Break

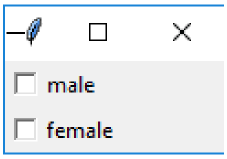
  Secret Code:

  Attach a File:nd 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()
```

Output:



4. **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)
```

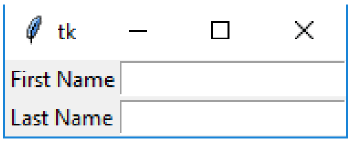
master is the parameter used to represent the parent window.

There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **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()
```

Output:



5. **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.
```

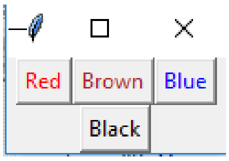
There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **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()
```

Output:



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.
   The general syntax is:

```
w=Label(master, option=value)
master is the parameter used to represent the parent window.
```

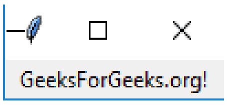
There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **bg**: to set he normal background color.
- **bg** to set he 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='GeeksForGeeks.org!')
w.pack()
root.mainloop()
```

Output:



GeeksForGeeks.org!

7. **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.
```

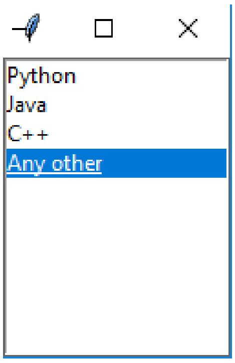
There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **highlightcolor**: To set the color of the focus highlight when widget has to be focused.
- **bg**: to set he 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()
```

Output:



Python
Java
C++
Any other

8. **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.
```

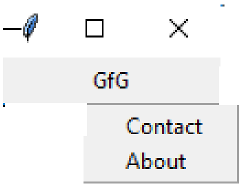
There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **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 he 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 = &quot;GfG&quot;)
mb.grid()
mb.menu  =  Menu ( mb, tearoff = 0 )
mb[&quot;menu&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()
```

Output:



9. **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.
```

There are number of options which are used to change the format of this widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

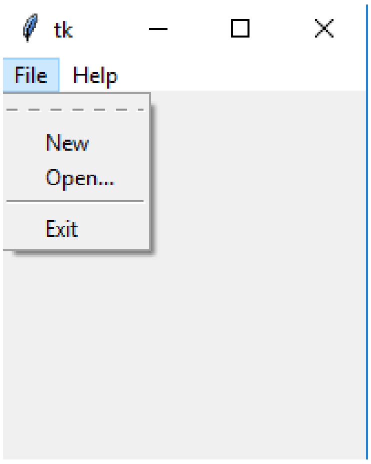
- **title**: To set the title of the widget.
- **activebackground**: to set the background color when widget is under the cursor.
- **activeforeground**: to set the foreground color when widget is under the cursor.
- **bg**: to set he normal background color.

- **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()
```

Output:



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

```
w = Message(master, option=value)
master is the parameter used to represent the parent window.
```

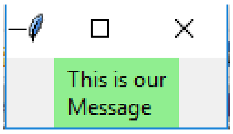
There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **bd**: to set the border around the indicator.
- **bg**: to set he 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( )
```

Output:



This is our Message

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.
    The general syntax is:

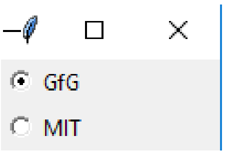
    ```
    w = RadioButton(master, option=value)
    ```

    There are number of options which are used to change the format of this widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

    - **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 he 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()
    ```

    Output:

    ● GfG
    ○ MIT

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

    ```
    w = Scale(master, option=value)
    master is the parameter used to represent the parent window.
    ```

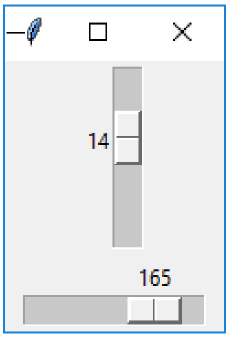
    There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

    - **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 he 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()
```

Output:



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

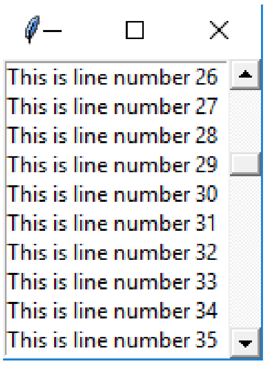
```
w = Scrollbar(master, option=value)
master is the parameter used to represent the parent window.
```

There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **width**: to set the width of the widget.
- **activebackground**: To set the background when mouse is over the widget.
- **bg**: to set he 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()
```

Output:


This is line number 26
This is line number 27
This is line number 28
This is line number 29
This is line number 30
This is line number 31
This is line number 32
This is line number 33
This is line number 34
This is line number 35

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

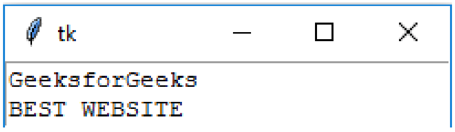
```
w  =Text(master, option=value)
```

There are number of options which are used to change the format of the text. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **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 he 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, 'GeeksforGeeks\nBEST WEBSITE\n')
mainloop()
```

Output:



GeeksforGeeks
BEST WEBSITE

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

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

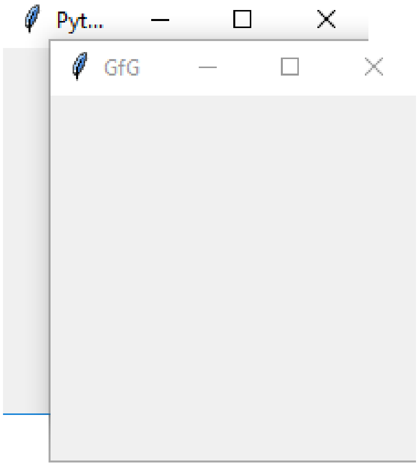
There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **bg**: to set he 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('GfG')
top = Toplevel()
top.title('Python')
top.mainloop()
```

Output:



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

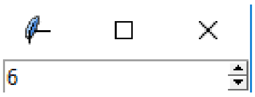
```
w = SpinBox(master, option=value)
```

There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **bg**: to set he 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()
```

Output:



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

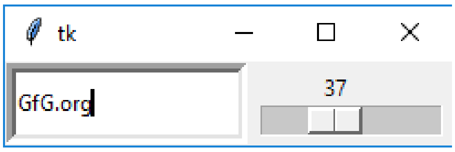
```
w = PannedWindow(master, option=value)
```

master is the parameter used to represent the parent window.
There are number of options which are used to change the format of the widget. Number of options can be passed as parameters separated by commas. Some of them are listed below.

- **bg**: to set he 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()
```

Output:



This article is contributed by **Rishabh Bansal**. If you like GeeksforGeeks and would like to contribute, you can also write an article using contribute.geeksforgeeks.org or mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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30

2.8

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Name

arun yadav • 3 months ago • edited

Pls check the syntax, its giving me the same error as well.or pls explain the error.

--

--
Menu button--
"mb = Menubutton (top, text = "GfG") "

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Lennox • 4 months ago

When the program is run you get an error message:
File "/home/fbce23e60b1cacc808349ee8564...", line 1, in
<module> from tkinter import *
ImportError: No module named tkinter

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kamaraj anis • 9 months ago

what is mean by sticky=W parameter in checkbutton

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santosh saxena ➦ kamaraj anis • 6 months ago

means what you are writting will shift to west
w means (west)

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Snehanshu Phukon • 10 months ago

I wonder why there's still no way to display HTML on Tkinter? TKHtml isn't full fledged. It doesn't support hyperlinks.

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Kristy Whalen ➦ Snehanshu Phukon • 9 months ago

Perhaps you could use a button and *somehow* set its background to transparent? When the button is clicked, generate new text in the window??

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suman nelli • a year ago

Hi,
Could you please, tell me that how to add a background image for window in tkinter ..Please reply
Thanks In advance

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Robert Lamothe • a year ago

Hey Guys -- #8 MenuButton section -- needs a cleanup on quotes
For noobs like me:
should be >>>
mb = Menubutton (top, text = "GfG")
mb.grid()
mb.menu = Menu (mb, tearoff = 0)
mb["menu"] = mb.menu

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Liam Bishop • 2 years ago • edited

So I've started using python and I'm trying to get a GUI up. So I've been looking and a few guide including this one tell me to import tkinter. But my python (2.7.15) does not recognize that module. Any ideas?

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sridam biswas ➦ Liam Bishop • a year ago

dude! have you installed it using sudo apt install