# Lesson 9

## Introduction to Graphical User Interfaces I

A Graphical User Interface or GUI (pronounced ‘gooey’) is the computing term for buttons, icons and other images or graphics used to control programs. We will now learn how to add these things into our programs.

We will be using a Python module called tkinter to produce the GUIs. Tkinter is a set of tools that lets you create pictures, or graphics on the screen.

## Global Variables

A **global variable** can be used by any part of a program. Variables created outside functionsare global. You can access them inside functions using the keyword, **global**. If you create a variable inside a function, it can be used ONLY inside that function.

```
myMessage = "Hello World!" # global string variable containing a message

def printMessage(): # function to print out a message
    global myMessage # use global variable within function

    print(myMessage) # print the message in the global variable

def main(): # main() function
    printMessage() # call function

if __name__ == "__main__":
    main() # call main() function
```

It is a good idea to get yourself familiar with global variables as we will be using them in this lesson and in the future!

## Creating a Button

The first thing we will do is learn how to make a button that the user can press to do something. When somebody clicks a button, it is known as an **event**.

The code below will create a simple button that will print out a message when it has been clicked.

```
import tkinter # import module

def makeButton(window): # function to create a button object
    button = tkinter.Button(window, text="Press...", width=20) # create button with text
    button.pack(padx=10, pady=10) # add 10 pixels of padding around the button

    return button # return the button object

def onClick(event): # function that is called when an event occurs
    print("Button Clicked") # print "Button Clicked" when function is called

def main(): # main function
    window = tkinter.Tk() # create tkinter window

    button = makeButton(window) # call makeButton() function

    button.bind("<ButtonRelease-1>", onClick) # bind the button to the onClick function

    window.mainloop() # run code attached to the window

if __name__ == "__main__":
    main() # call main() function
```

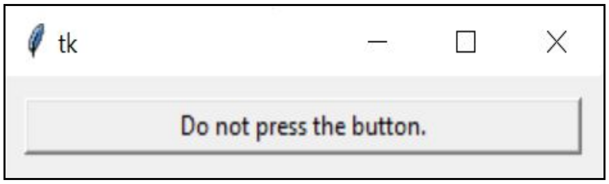
**Tasks:**

1. Copy and run the code above.
2. Change the width of the button to 40 pixels.
3. Print out how many times the user has clicked the button. You will need to declare a ***clickCount*** variable, change the ***onClick()*** function to increase a clickCount by one and print out the value of ***clickCount***.

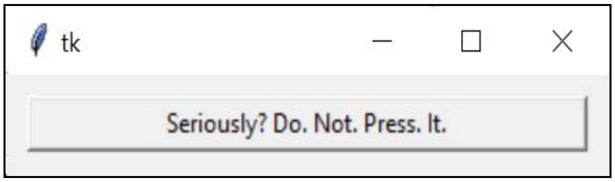
   **Hint:** ***clickCount*** will need to be a global variable so it can be set to zero initially and then incremeneted by one in ***onClick()***.

# Don’t Press The Button Project

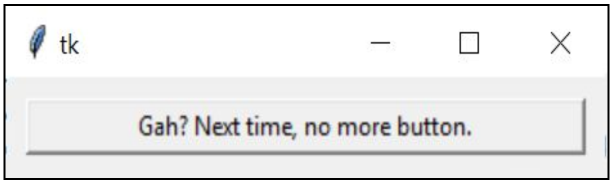
Write a program that creates a button that will display different messages when someone clicks on it. The user should have three chances to press the button before it disappears.



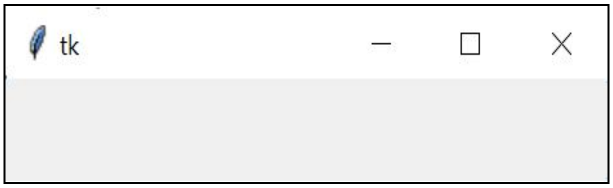
↓



↓



↓



The main difference between this project and the simple button we made in the previous section will be the ***onClick()*** function. You need to increase the ***clickCount*** variable by one when the button is clicked (like before) and then you need to use conditional if statements to change the button.

See the pseudo code below to help you!

```
if clickCount == 1:
    change button
elif clickCount == 2:
    change button
else:
    delete button
```

In order to change the text within the button, do something like the following:

```
button.configure(text="blah blah blah") # change message in button
```

To delete the button, you can use the following piece of code:

```
button.pack_forget() # delete the button
```

**Tasks:**

1. Create the button with the messages that can be seen above on the previous page.
2. Add two more messages in the button before it is deleted.