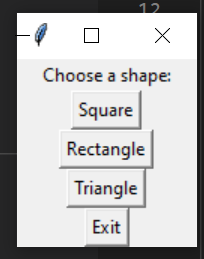
**Area Calculator GUI Midterm Report:**

I wanted to create an Area Calculator that’s able to find the area of a square, rectangle, and triangle. I think the formulas for these shapes are very simple and something I could easily create. The hard part for me during this process was figuring out how to make the gui work. I’m not familiar with GUI’s and I haven’t used a lot of Python since CS 1030.

In my code I had one class called “Shape”. It has a window that has a label asking the user to pick a shape. Each shape is a button that you click on. When you click on a shape. A new window pops up for you to add your inputs to calculate the area. Each shape has its’ own function/method that connects to the shape class and the area calculator window. After you click on a shape. It links to the area calculator and shows you the inputs you need to calculate your shape. There’s a calculate function that has if statements based on the shape of you rchoice. This is so the program knows which calculation to do and the formula for it. In my code, I also included an exit button for the user to exit the GUI if they want. One thing that I wanted to include was a way to ask the users, if they want to calculate another shape. I wasn’t able to successfully do that in the GUI without errors occurring. That’s they only thing I would add next time and maybe more shape options.

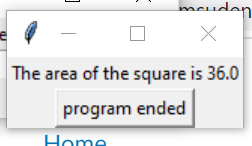
**Screenshot of my GUI working:**



**Clicked on square:**

Graphical user interface, application

Description automatically generated



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**Clicked on rectangle:**

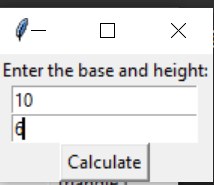
Graphical user interface, application

Description automatically generated

Graphical user interface, text, application

Description automatically generated

**Clicked on triangle:**



Graphical user interface, text, application

Description automatically generated

**Clicked on exit:**

**GUI window disappeared**

My python code:

'''I googled alot to learn some stuff I didn't know how to implement. I used w3schools to learn some things

I also didn't know how to not use the width for the square, so it helped me with that. You have to use "None"

I used https://www.tutorialspoint.com/python/tk\_toplevel.htm

and I used the geeksforgeeks website on python syntax and small issues I had

I couldn't figure out a way to make the calculation end and give the user an option to make another calculation'''

import tkinter as tk

class Shape:  #shape class that has the shapes and exit buttons

    def \_\_init\_\_(self, root):

        self.root = root # root represents main window

        root.title("Shape Calculator")

        self.shape = None

        self.label = tk.Label(root, text="Choose a shape:")  #label or a title

        self.label.pack()

        self.square\_button = tk.Button(root, text="Square", command=self.square) #square button

        self.square\_button.pack()

        self.rectangle\_button = tk.Button(root, text="Rectangle", command=self.rectangle) #rectangle button

        self.rectangle\_button.pack()

        self.triangle\_button = tk.Button(root, text="Triangle", command=self.triangle) #triangle button

        self.triangle\_button.pack()

        self.exit\_button = tk.Button(root, text="Exit", command=root.quit) #quit makes it so, it ends the program

        #ends the program if the button quit is clicked

        self.exit\_button.pack()

   #these next three methods are called after user selects a shape

    def square(self): #method for square and similar ones for all the shapes

        self.shape = "Square"

        self.area\_window() #opens the area window

    def rectangle(self):

        self.shape = "Rectangle"

        self.area\_window()

    def triangle(self):

        self.shape = "Triangle"

        self.area\_window()

    def area\_window(self):  #area method or function, also a window

        self.area\_window = tk.Toplevel(self.root)

        if self.shape == "Square":

            self.area\_window.title("Square Area Calculator")

            self.label = tk.Label(self.area\_window, text="Enter the length of a side:")

            self.label.pack()

            self.length\_input = tk.Entry(self.area\_window)  #dot Entry allows user to put an input

            self.length\_input.pack()

            self.width\_input = None

        elif self.shape == "Rectangle":

            self.area\_window.title("Rectangle Area Calculator")

            self.label = tk.Label(self.area\_window, text="Enter the length and width:") # I made it so there was 2 inputs in one window

            self.label.pack()

            self.length\_input = tk.Entry(self.area\_window)

            self.length\_input.pack()

            self.width\_input = tk.Entry(self.area\_window)

            self.width\_input.pack()

        elif self.shape == "Triangle":

            self.area\_window.title("Triangle Area Calculator")

            self.label = tk.Label(self.area\_window, text="Enter the base and height:")

            self.label.pack()

            self.length\_input = tk.Entry(self.area\_window)

            self.length\_input.pack()

            self.width\_input = tk.Entry(self.area\_window)

            self.width\_input.pack()

        self.calculate\_button = tk.Button(self.area\_window, text="Calculate", command=self.calculate\_area)

        #button that starts the calculation, it used to the calculate\_area method

        self.calculate\_button.pack()

    def calculate\_area(self): #calculations for the

        length = float(self.length\_input.get()) #all shapes have a lenght input

        if self.width\_input:  #this is only for rectangle and triangle

            width = float(self.width\_input.get())

        if self.shape == "Square":  #if statement to choose which calculation to do

            area = length \*\* 2   #square formula. length squared

            answer = f"The area of the square is {area}"

        elif self.shape == "Rectangle":

            area = length \* width

            answer = f"The area of the rectangle is {area}"

        elif self.shape == "Triangle":

            area = 0.5 \* length \* width

            answer = f"The area of the triangle is {area}"

        self.result\_window = tk.Toplevel(self.area\_window) #Toplevel is a widget that can be created on top of the main window

        self.result\_window.title("Result")

        self.result\_label = tk.Label(self.result\_window, text=answer)  #dispays the answer of the calculation in the

                                                                        #result window

        self.result\_label.pack()

        self.result\_button = tk.Button(self.result\_window, text="program ended", command=self.close\_windows)

        self.result\_button.pack()

    def close\_windows(self):

        self.result\_window.destroy() #ends result window

        self.area\_window.destroy() #ends area window

root = tk.Tk()#starting point of GUI

shape = Shape(root)#shape GUI and all it's widgets

root.mainloop() #makes GUI run, without it, it won't show the pop ups