

**CST1500 Coursework Report**

**2020 September Intake**

**Python  
Simple Calculator**

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# Introduction

For this coursework, the aim was to create a Simple Calculator in python, with various functionalities such as Multiply, Divide, Add or Subtract. Immediately, the idea of creating ‘personalized features’ according to the Computer Science field come to mind. That is why the calculator embark an ‘Programmer Mode’ letting the user Convert a decimal to the numeral system of its choice (Octal, Hexadecimal or Binary). Moreover the calculator contain features such as Clear / Backspace for complexity of operations. The GUI used for this coursework is made of course with Tkinter, as taught in class and were Inspired By the Windows 10 Calculator, simple, clean and modern aspects (e.i.Figure 1)

Calendar
Basic & Programmer Mode

Figure 1

# Development

## Approach

The First approached was to create a Calculator using frames grouping same objects, buttons, labels, etc… The GUI (tkinter, figure 2.1) was firstly made and the functions for a working Calculator were made after.  
The buttons would work using the same function, with a different argument, printing in the textvariable label, a character different from each button.



Figure 2.1

The Calculator Contain different functional part:

From the Basic Mode: Figure 3

* Result Label / Button Pad / Historic / Menu Button

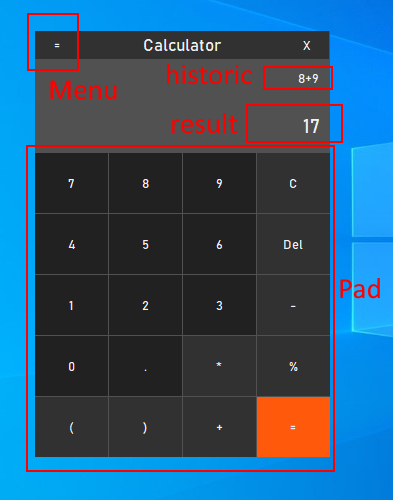


Figure 4

From the Menu Mode: figure 3

* Buttons

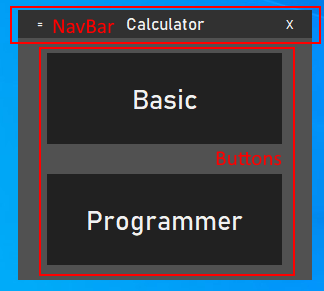


Figure 5

From the Programmer Mode: figure 4

* Entry / Selector + Conversion / Pad

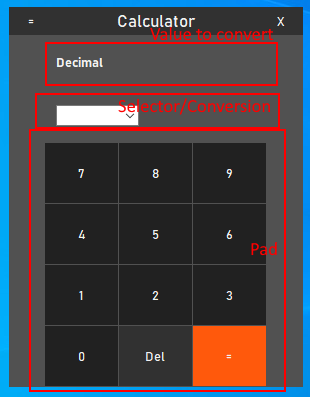


Figure 6

As seen The TopNavigationBar is the same for all Modes.

## Encountered problems

* Main problem encountered during the development of the calculator was the method of selecting a function for a button.  
  Effectively, A Tkinter Button function with a ‘command=’option , taking a function without passing arguments. To pass argument as wanted, for using the same command and printing different character for each button, we had to use Lambda function (figure 7).  
  Lambda function are small function that are anonymous and always return a single expression (Stack Overflow, n.d.).



Figure 7

* Moreover , the Hovering system for the button needed researches and Lambda functions(figure 9). Usage of “<Enter>” and “<Leave>” *(Pythonprogramming.net, 2019)* fromtkinter to recognized when the mouse is pointing toward the buttons (figure 8).

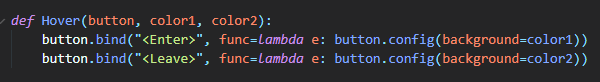


Figure 8

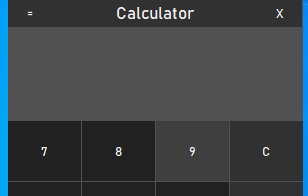


Figure 9

# Conclusion

# References

Stack Overflow. (n.d.). python - Tkinter Hovering over Button -> Color change. [online] Available at: <https://stackoverflow.com/questions/49888623/tkinter-hovering-over-button-color-change> .

Pythonprogramming.net. (2019). Python Programming Tutorials. [online] Available at: <https://pythonprogramming.net/passing-functions-parameters-tkinter-using-lambda/> .