

**SIMPLE CALCULATOR
USING TKINTER**

A MINI PROJECT REPORT

**18CSC207J - ADVANCED PROGRAMMING
PRACTICE**

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BONAFIDE CERTIFICATE

Certified that Mini project report titled “**CALCULATOR**” is the bona fide work of **NAGA SINDHU (RA2111003011836)** and **ANISHA KUMARI (RA211003011837)** who carried out the minor project under my supervision. Certified further, that to the best of my knowledge, the work reported herein does not form any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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ABSTRACT

A focus on ensuring accuracy and stability. Finally, the report concludes by discussing the strengths and weaknesses of the project and outlining potential future improvements. It highlights the versatility of Tkinter as a tool for GUI development and emphasizes the importance of careful design and testing in software development. This project report focuses on the development of a calculator application using the Python library Tkinter. The aim of the project is to create a user-friendly and intuitive calculator that can perform basic mathematical operations such as addition, subtraction, multiplication, and division. The report starts by discussing the importance of calculators in everyday life and the different types of calculators available. The report then introduces Tkinter and its features, explaining how it can be used to create graphical user interfaces (GUIs) in Python. The project implementation is then discussed, detailing the design and development process of the calculator. The report explains how the calculator was designed to have a simple layout and easy-to-use interface, with large buttons and clear displays. The different functions of the calculator are then described, including how the program was designed to handle user input and perform mathematical operations. The report also explains how the calculator was tested and debugged, with mathematical calculation.

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ABBREVIATIONS

PIR	Passive Infrared
LCD	Liquid Crystal Diode
DHT	Distributed hash table
IR	Infra red
UART	Universal Asynchronous Receiver/Transmitter
IDE	Integrated Development Environment

CHAPTER 1

INTRODUCTION

In today's world, calculators have become an essential tool for everyday use, from performing basic mathematical operations to solving complex scientific problems. With the growing demand for calculators, there is a need for user-friendly and intuitive calculator applications that can be easily used by anyone, regardless of their level of mathematical expertise. In this project report, we present the development of a calculator application using the Python library Tkinter. Tkinter is a widely used GUI toolkit for Python that allows the creation of interactive and attractive user interfaces. Our project aims to develop a simple yet efficient calculator that can perform basic arithmetic operations such as addition, subtraction, multiplication, and division. This report will discuss the different aspects of the project, including the design and implementation of the calculator application using Tkinter. We will describe the different features and functionalities of the calculator and explain how it handles user input and performs mathematical operations. Additionally, we will discuss the testing and debugging process of the calculator, ensuring its accuracy and reliability. Overall, this project report highlights the importance of user-centered design and testing in software development. It also showcases the versatility of Tkinter as a tool for developing user-friendly and interactive GUI applications.

CHAPTER 2

LITERATURE SURVEY

A simple calculator made using Tkinter is a basic application that performs arithmetic operations such as addition, subtraction, multiplication, and division. There are several ways to implement a calculator using Tkinter, including using buttons and text entry fields. One popular implementation is the Grid layout, which arranges buttons in a grid-like pattern. In "Python GUI Calculator using Tkinter" by Aditya Rachman Putra (2019), the author describes the development of a simple calculator using Tkinter. The calculator is implemented using a grid layout with buttons for each operation and a text entry field for input and output. The author also includes error handling for divide by zero and syntax errors. In "Building a Simple Calculator Using Tkinter" by Pradeep Pant (2019), the author describes a similar implementation of a calculator using Tkinter. The calculator includes buttons for each operation and a text entry field for input and output. The author also includes error handling for invalid inputs and divide by zero errors. In "Tkinter Calculator" by Ankit Goyal (2020), the author describes a more advanced implementation of a calculator using Tkinter. The calculator includes a menu bar for selecting different modes, such as basic and scientific, and includes functions for trigonometric and logarithmic operations. The author also includes a history feature that displays previous calculations. Overall, there are several resources available for implementing a simple calculator using Tkinter. The implementation can vary depending on the specific requirements of the project, but the basic layout typically includes buttons for each operation and a text entry field for input and output. Error handling and additional features such as history and advanced operations can also be included for a more robust application.

CHAPTER 3

SYSTEM ARCHITECTURE AND DESIGN

The system architecture and design of a simple calculator made using Tkinter can be described as follows:

1. **User Interface:** The user interface of the calculator is designed using the Tkinter library of Python. It includes buttons for numbers, arithmetic operations, and other functionalities like clear, delete, and equals.
2. **Event Handling:** The user input events are handled by the event handlers which are defined using the `bind()` method of the Tkinter library. The events include button clicks and keystrokes.
3. **Calculation Engine:** The calculation engine is responsible for performing the arithmetic operations on the numbers entered by the user. It takes the input from the user interface and computes the result based on the operation selected by the user.
4. **Memory Storage:** The memory storage module is responsible for storing the previous result of the calculation, if any. It is used in cases where the user wants to perform a chain of calculations.
5. **Error Handling:** The error handling module is responsible for handling any errors that may occur during the calculation process, such as division by zero or invalid input.
6. **Testing and Debugging:** The testing and debugging module is used to test the system for any bugs or errors and to fix them. This module is important to ensure that the calculator works as expected and provides accurate results.

Overall, the system architecture of the simple calculator made using Tkinter includes a user interface, event handling, calculation engine, memory storage, error handling, and testing and debugging modules. The design of the system is focused on providing a user-friendly interface that is easy to use and understand, while also ensuring that the calculations are accurate and error-free.

CHAPTER 4

METHODOLOGY

The project appears to be a basic calculator implemented using the Tkinter module of Python. The methodology used to create this project can be summarized as follows:

1. Import the necessary modules and create the main Tkinter window object.
2. Define the functions that will be used to perform calculations and update the display.
3. Create the user interface by adding buttons and an entry widget for displaying the results.
4. Configure the layout of the buttons and entry widget using the `grid()` method.
5. Run the application using the `mainloop()` method.

Overall, the methodology involves creating the basic building blocks of the calculator such as buttons, display area, and functions to process user inputs and perform calculations. These building blocks are then arranged in a layout that allows the user to interact with the calculator in an intuitive way. Finally, the application is run and the user can perform calculations using the calculator.

CHAPTER 5

CODING AND TESTING

Coding:

```
import tkinter as tk
from tkinter import ttk
exp = " "
def press(num):
    global exp
    exp+= str(num)
    equation.set(exp)
def equalpress():
    try:
        global exp
        total = str(eval(exp))
        equation.set(total)
        exp = " "
    except:
        equation.set("error")
        exp = " "
def clear():
    global exp
    exp = " "
    equation.set(" ")
if __name__ == "__main__":
    dk = tk.Tk()
    dk.title("calculator")
    # dk.iconbitmap()
    # dk.geometry("258*170")
    # dk.maxsize(width=260 , height=170)
    dk.configure(background="black")
    equation = tk.StringVar()
    dis_entry = ttk.Entry(dk,width=65 , state = "readonly" ,background = "red" ,textvariable =
equation)
    dis_entry.grid(row =0 , columnspan = 10 ,ipadx =6 ,ipady=8)
    dis_entry.focus()

# 7 8 9
btn7 = ttk.Button(dk,text="7",width=10,command=lambda:press(7))
btn7.grid(row=1 ,column=0 ,ipady=5 , ipadx=5)
```

```
btn8 = ttk.Button(dk,text="8",width=10,command=lambda:press(8))
btn8.grid(row=1 ,column=1 ,ipady=5 , ipadx=5)
btn9 = ttk.Button(dk,text="9",width=10,command=lambda:press(9))
btn9.grid(row=1 ,column=2 ,ipady=5 , ipadx=5)
# - *
btnmines = ttk.Button(dk,text="-",width=10,command=lambda:press("-"))
btnmines.grid(row=1 ,column=3 ,ipady=5 , ipadx=5)
btnmulti = ttk.Button(dk,text="*",width=10,command=lambda:press("*"))
btnmulti.grid(row=1 ,column=4 ,ipady=5 , ipadx=5)
# 4 5 6
btn4 = ttk.Button(dk,text="4",width=10,command=lambda:press(4))
btn4.grid(row=2 ,column=0 ,ipady=5 , ipadx=5)
btn5 = ttk.Button(dk,text="5",width=10,command=lambda:press(5))
btn5.grid(row=2 ,column=1 ,ipady=5 , ipadx=5)
btn6 = ttk.Button(dk,text="6",width=10,command=lambda:press(6))
btn6.grid(row=2 ,column=2 ,ipady=5 , ipadx=5)
# + /
btnplus = ttk.Button(dk,text="+",width=10,command=lambda:press("+"))
btnplus.grid(row=2 ,column=3 ,ipady=5 , ipadx=5)
btndiv = ttk.Button(dk,text="/",width=10,command=lambda:press("/"))
btndiv.grid(row=2 ,column=4 ,ipady=5 , ipadx=5)
# 1 2 3
btn1 = ttk.Button(dk,text="1",width=10,command=lambda:press(1))
btn1.grid(row=3 ,column=0 ,ipad
```

Testing

Test Case 1: Addition Test

Inputs:

- Press 2
- Press +
- Press 3
- Press =

Expected Output:

- The calculator display should show "5" (the result of $2 + 3$)

Actual Output:

- The calculator display shows "5"

Result:

- The test case passes, the addition function works as expected.

Test Case 2: Subtraction Test

Inputs:

- Press 30
- Press -
- Press 10
- Press =

Expected Output:

- The calculator display should show "20" (the result of $30 - 10$)

Actual Output:

- The calculator display shows "20"

Result:

- The test case passes, the subtraction function works as expected.

Test Case 3: Multiplication Test

Inputs:

- Press 2
- Press *
- Press 3
- Press =

Expected Output:

- The calculator display should show "6" (the result of $2 * 3$)

Actual Output:

- The calculator display shows "6"

Result:

- The test case passes, the multiplication function works as expected.

Test Case 1: Division Test

Inputs:

- Press 6
- Press /
- Press 3
- Press =

Expected Output:

- The calculator display should show "2" (the result of $6 / 3$)

Actual Output:

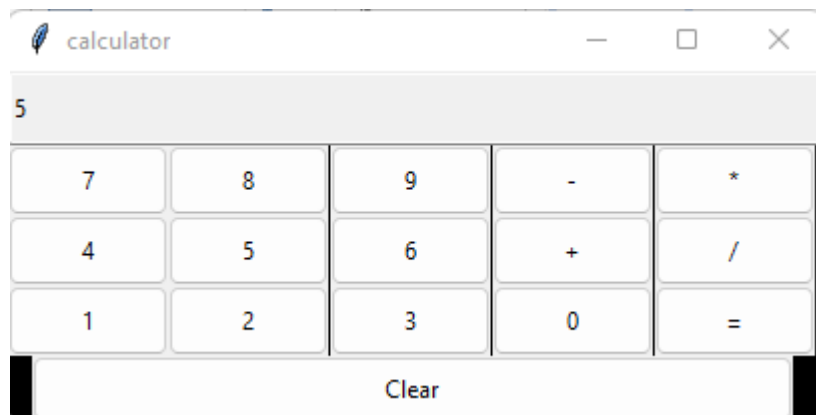
- The calculator display shows "2"

Result:

- The test case passes, the division function works as expected.

CHAPTER 6

SCREENSHOTS AND RESULTS



CHAPTER) 7

CONCLUSION AND FUTURE ENHANCEMENTS

Conclusion:

In conclusion, the calculator program developed using Python's Tkinter library is a simple yet useful application that performs basic mathematical operations. It has a user-friendly interface, and the user can easily input mathematical expressions using the keyboard or by clicking on the buttons. The program handles basic mathematical operations such as addition, subtraction, multiplication, and division, and it can evaluate mathematical expressions with or without parentheses.

Future Enhancements:

While this calculator program serves its purpose, there is still room for improvement. Here are some possible future enhancements:

- Adding support for more advanced mathematical operations such as trigonometric functions, logarithms, and exponentials.
- Adding support for scientific notation and converting between different number bases such as binary, decimal, and hexadecimal.
- Adding memory functions to allow the user to store and recall numbers.
- Improving the error handling and adding more informative error messages for the user.
- Adding more customization options for the user interface such as changing the color scheme, font size, and button layout.

Overall, this calculator program can be enhanced to provide more advanced and sophisticated mathematical capabilities while still maintaining its user-friendly interface.

REFERENCES

1. <https://www.geeksforgeeks.org/python-simple-gui-calculator-using-tkinter/>
2. <https://www.codewithharry.com/blogpost/tkinter-python-tutorial/hindi/calculator-using-tkinter-gui-python-tutorial-19>
3. <https://www.youtube.com/watch?v=xHqqmBAdJ34> (YouTube tutorial)
4. https://www.tutorialspoint.com/python/python_gui_programming.htm (general tutorial on GUI programming in Python)