



MINI PROJECT REPORT ON “ Simple Calculator ”

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DECLARATION

We hereby declare that this submission is our own work and that, to the best of mine knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award for any other degree or diploma of the university or other institute of higher learning, except where acknowledgement has been made in the text.

Name :- Moirangthem Satyabrata

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Session 2024 – 25

CERTIFICATE



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It is to certify that Moirangthem Satyabrata of class MCA 1st Year under University Roll Number :- 24MCA20343 has completed the project titled “ Simple Calculator ” in which the language used is Python, Tkinter, Operating System for the Masters of Computer Application 1st Semester under my supervision. The work done in project is a result of the candidate's own efforts and report maintains is satisfied as per requirement.

Project Guide :-

Mr. Shivam Sharma



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Abstract

The Simple Calculator project is a basic yet effective software application developed in Python, providing users with a straightforward interface for performing fundamental arithmetic operations. Calculators are essential tools, serving functions in education, finance, engineering, and everyday life. This project leverages Python's tkinter library to build a functional calculator with a graphical user interface (GUI), allowing users to execute basic mathematical calculations like addition, subtraction, multiplication, and division easily and efficiently.

One of the primary motivations behind this project is to make mathematical calculations accessible and intuitive, catering to both novice users and individuals with programming knowledge. The project combines practical programming with user-friendly design, demonstrating how simple logic and a GUI-based approach can create a valuable tool for end-users. Unlike conventional console-based calculators, the GUI provides a familiar layout for users, with buttons for each operation and number entry, making the calculator easy to navigate.

This project also illustrates how Python, with minimal coding and libraries, can be used to create effective standalone applications for everyday use. By combining essential arithmetic functions with a simple interface, the Simple Calculator project serves as an educational tool for those new to GUI programming while providing a fully functional calculator for real-world tasks. The project can also be expanded with additional features, such as scientific functions or memory capabilities, offering a foundation for more complex software development in the future.



Introduction

The Simple Calculator project introduces an interactive tool for performing basic arithmetic calculations through a visually appealing and easy-to-use interface. The project demonstrates how Python's tkinter library can be used to create a GUI-based calculator that simplifies the process of entering and solving basic math problems. Designed with functionality and ease of use in mind, this project aims to offer a convenient solution for performing quick calculations without needing a physical calculator or complex software.

Calculators are widely used in various disciplines, making this project relevant for a broad audience. The project utilizes Python due to its simplicity and the widespread availability of its libraries, such as tkinter for GUI design. By using Python, this calculator becomes accessible on multiple operating systems, including Windows, macOS, and Linux, allowing it to reach a broad spectrum of users. The calculator has a clean layout, with numeric buttons and operation buttons clearly separated, ensuring that even beginners can use it comfortably.

Furthermore, this project provides insight into GUI programming for Python learners. GUI-based applications often present a challenge to new developers, but with tkinter, the process of creating and arranging buttons, handling events, and capturing user input becomes more approachable. The Simple Calculator serves as a foundational project for understanding how to build user interfaces, making it ideal for both educational purposes and practical daily use.



Objective

The primary objective of the Simple Calculator project is to develop a reliable and user-friendly tool that enables users to perform basic arithmetic operations quickly and accurately. The calculator is designed to be intuitive, ensuring users of all ages can interact with it easily. By focusing on essential operations such as addition, subtraction, multiplication, and division, the project aims to provide a solution that meets the most common calculation needs of users.

Another objective of this project is to offer a practical example of Python GUI programming. For individuals new to programming, creating a functional calculator using tkinter serves as an excellent learning experience, illustrating key programming concepts such as event handling, widget management, and basic arithmetic logic. This project encourages learning through hands-on experience, providing insight into how code interacts with a graphical interface.

The project also seeks to be adaptable and modular, laying the groundwork for future enhancements. By keeping the design simple and the code modular, the calculator can be expanded to include scientific calculations, memory functions, and even aesthetic customizations. This modularity supports further development, allowing students and hobbyists alike to build upon the project, gaining deeper insights into GUI programming and software design principles.

Technology used :-

Python :- The core programming language used for the calculator's logic and functionality.

Tkinter :- The Python library used for creating the graphical user interface, offering a simple yet effective method for layout and event handling.

Operating Systems :- The calculator can be run on any operating system that supports Python, including Windows, macOS, and Linux.



Code

```
import tkinter as tk

from tkinter import messagebox

# Main calculator class

class Calculator:

    def __init__(self, root):

        self.root = root

        self.root.title("Simple Calculator 📈 ")

        self.root.geometry("300x400")

        self.root.config(bg="lightblue")

        self.equation = tk.StringVar()

        # Input field

        self.input_field = tk.Entry(self.root, textvariable=self.equation, font=("Arial", 18), borderwidth=2,
        relief="solid")

        self.input_field.grid(row=0, column=0, columnspan=4, ipadx=8, ipady=10, pady=20)

        # Button layout with an emoji button

        buttons = [

            ('✖ 1, 0), ('✖ 1, 1), ('✖ 1, 2), ('÷ ', 1, 3),

            ('✖ 2, 0), ('✖ 2, 1), ('✖ 2, 2), ('✖ ', 2, 3),

            ('✖ 3, 0), ('✖ 3, 1), ('✖ 3, 2), ('-', 3, 3),

            ('✖ 4, 0), ('.', 4, 1), ('+', 4, 2), ('=', 4, 3),

            ('C ↴ ', 5, 0), ('Emoji 😊', 5, 1) # Emoji button

        ]

        # Create buttons

        for (text, row, col) in buttons:
```



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```
self.create_button(text, row, col)

# Button creation function

def create_button(self, text, row, col):

    button = tk.Button(self.root, text=text, width=8, height=3, font=("Arial", 12),
                       command=lambda: self.on_button_click(text))

    button.grid(row=row, column=col, padx=5, pady=5)

# Button click event handler

def on_button_click(self, char):

    if char == 'C ✎':
        self.equation.set("")

    elif char == '=':
        try:
            result = eval(self.equation.get())
            self.equation.set(result)
        except:
            self.equation.set("Error")
            messagebox.showerror("Error", "Invalid Input")

    elif char == 'Emoji 😊':
        # Add an emoji to the input field
        self.equation.set(self.equation.get() + '😊')

    else:
        # Replace some symbols to match Python syntax
        symbol = str(char).replace('□ ', '+').replace('—', '-').replace('×', '*').replace('÷', '/')
        self.equation.set(self.equation.get() + symbol)
```



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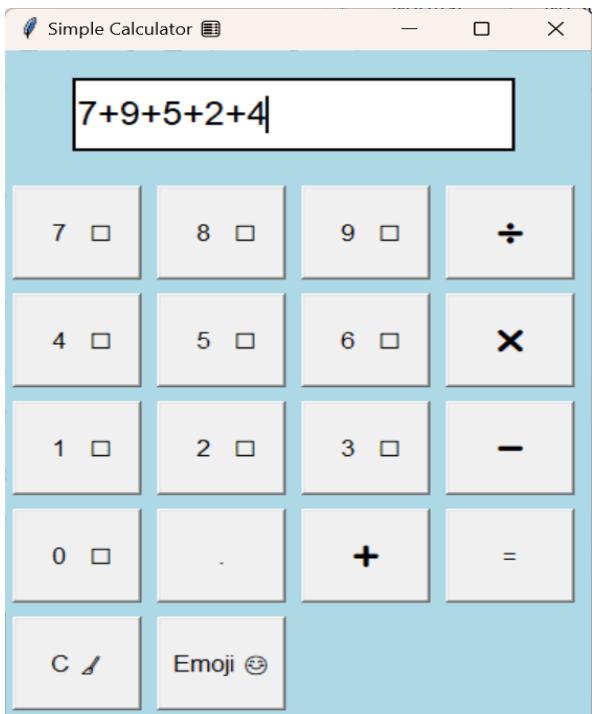
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```
# Main function to run the calculator
```

```
if __name__ == "__main__":
    root = tk.Tk()
    calculator = Calculator(root)
    root.mainloop()
```

Output





Conclusion

The Simple Calculator project showcases how Python and tkinter can be combined to create a functional and visually accessible tool for performing arithmetic operations. Through its development, the project provides insight into Python's GUI programming capabilities, serving as an educational resource for beginners and a practical tool for everyday use. By focusing on simplicity and usability, the project demonstrates the effectiveness of Python for creating applications that are both functional and user-friendly.

In summary, the Simple Calculator project successfully fulfils its purpose of offering an intuitive, reliable tool for performing basic calculations. Its simple design makes it accessible, while its Python foundation ensures that it is easy to modify and expand. The project not only highlights the potential of Python in software development but also encourages further learning and creativity by providing a customizable foundation that can be built upon to create more complex applications.

GitHub

GitHub Link :-