Mini Project on Calculator Using Python

Project Title: Mini Project on Calculator Using Python

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Course: python internship

Company: Slash mark IT solutions

Date: 20/5/2025-25/5/2025

Abstract

This mini project presents the development of a simple calculator using Python. The calculator performs basic arithmetic operations such as addition, subtraction, multiplication, and division. The project demonstrates fundamental programming concepts, including user input, functions, and conditional statements. The system is designed as a command-line application, ensuring ease of use and reliability.

Table of Contents

1. Introduction

Calculators are essential tools for performing arithmetic operations efficiently. This project aims to build a basic calculator using Python, a popular programming language known for its simplicity and readability. The project serves as a practical exercise to reinforce programming fundamentals.

2. Objectives

- To develop a functional calculator using Python.
- To implement basic arithmetic operations: addition, subtraction, multiplication, and division.
- To enhance understanding of functions, user input, and control structures in Python

3. System Requirements

Hardware:

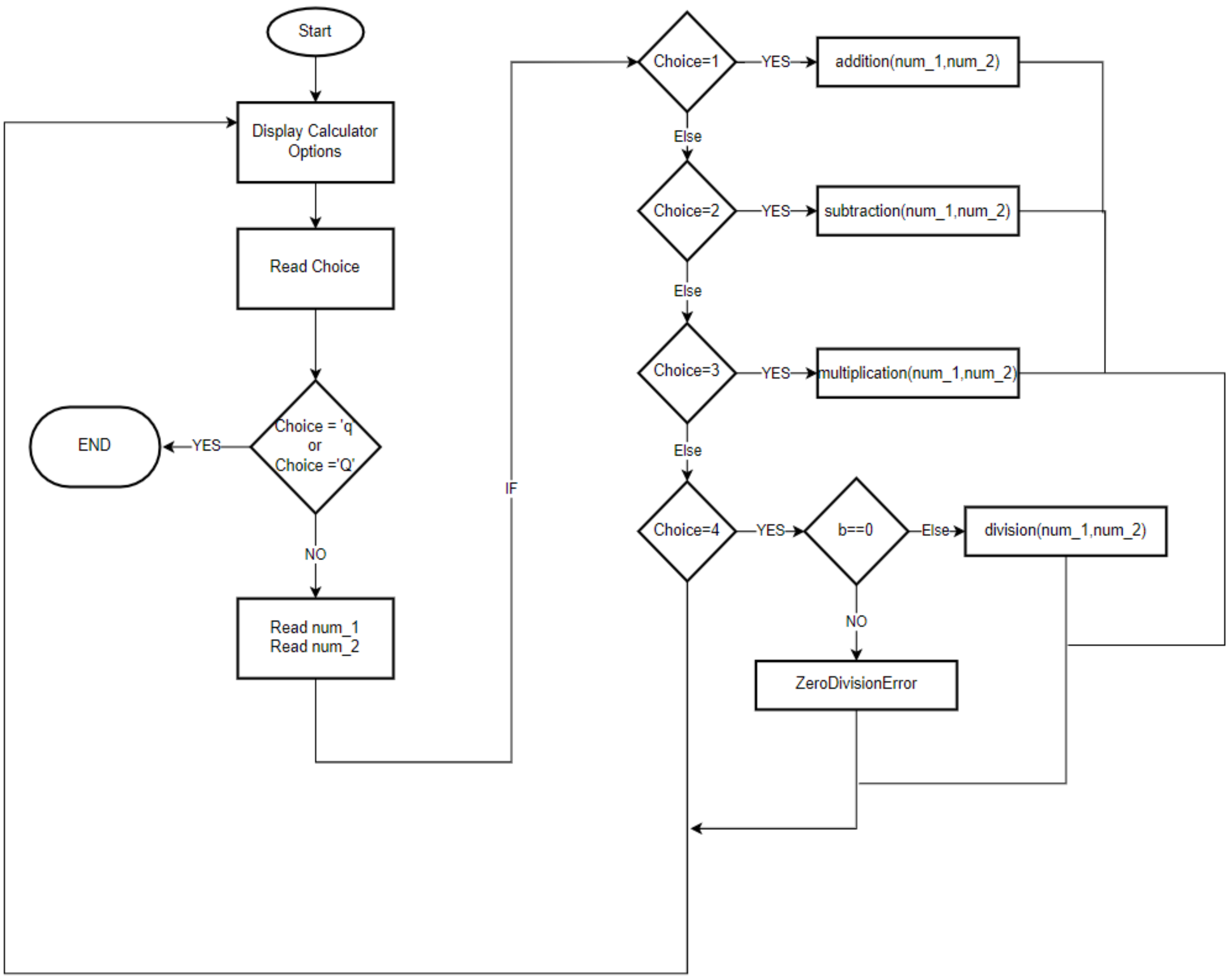
- Processor:Intel(R) Core(TM) i5-1035G1 CPU @ 1.00GHz   1.19 GHz
- Installed RAM8.00 GB (7.77 GB usable)
- Device ID	2F0DA166-C34F-44D9-80DC-1264CC873D6C
- System type	64-bit operating system, x64-based processor

Software: Python 3.x, Text Editor (VS Code, Sublime Text).

Operating System: Windows.

4. System Design

Flow chat



Function Structure

- add(x, y)
- subtract(x, y)
- multiply(x, y)
- divide(x, y)

5. Code implementation

```
def calc (x,y,op):
       if op == '1':
            return x + y
      if op == '2':
            return x - y
     if op == '3':
          return x * y
     if op == '4':
          if y == 0:
              return "Error! Division by zero.
         return x / y

while True:
        print("Select operation")
        print("1.Add")
        print("2.Subtract")
        print("3.Multiply")
        print("4.divide")
     op = input(" Enter choice (1/2/3/4):")

 if op in ('1','2','3','4'):
         try:
              a = float(input("Enter first number:"))
              b = float(input("Enter second number:"))
              print("result:",calc (a,b,op))
         except:
                 print("Invalid input")
        if input("Next calculation?(yes/no):") == "no":
                break
        else:
              print("invalid choice")
```

6.Testing and Results

6.1 Test Cases

Test No.	**Input 1**	**Input 2**	**Operation**	**Expected Output**	**Actual Output**
1	10	5	Add	15	15.0
2	10	5	Subtract	5	5.0
3	10	5	Multiply	50	50.0
4	10	5	Divide	2	2.0
5	10	0	Divide	Error	Error! Division by zero.

6.2 Sample output

```
=== Simple Calculator ===
Select operation:
1. Add
2. Subtract
3. Multiply
4. Divide
5. Exit
Enter choice (1/2/3/4/5): 1
Enter first number: 10
Enter second number: 5
Result: 15.0
```

7. System's Performance

- **Efficiency:** The calculator provides instant results for all basic operations.
- **Accuracy:** All operations are computed correctly, including error handling for division by zero.
- **Resource Usage:** Minimal, as it is a command-line application.

8. Comparison of Initial Goals and Actual Results

Initial Goals	**Actual Results Achieved**
Implement basic arithmetic operations	Achieved
Handle invalid input and division by zero	Achieved
User-friendly interface	Achieved (simple command-line prompts)
Modular code using functions	Achieved

9. Challenges Faced

- **Handling Division by Zero:** Initially, the program would crash if the second number was zero during division. This was resolved by adding a conditional check in the divide() function.
- **Input Validation:** Ensuring the user enters valid numbers and operation choices required additional prompts and error messages.

10. Conclusion

This project successfully demonstrates the design and implementation of a simple calculator using Python. All initial objectives were met, and the project enhanced my understanding of Python programming, especially functions and user interaction. The calculator is accurate, efficient, and easy to use

11. Future Scope

- **Advanced Operations:** Add support for exponentiation, square roots, and trigonometric functions.
- **Graphical User Interface:** Develop a GUI
- **Continuous Calculations:** Allow users to perform multiple calculations without restarting the program.
- **Input Validation:** Enhance input validation for better robustness.

12. References/Bibliography

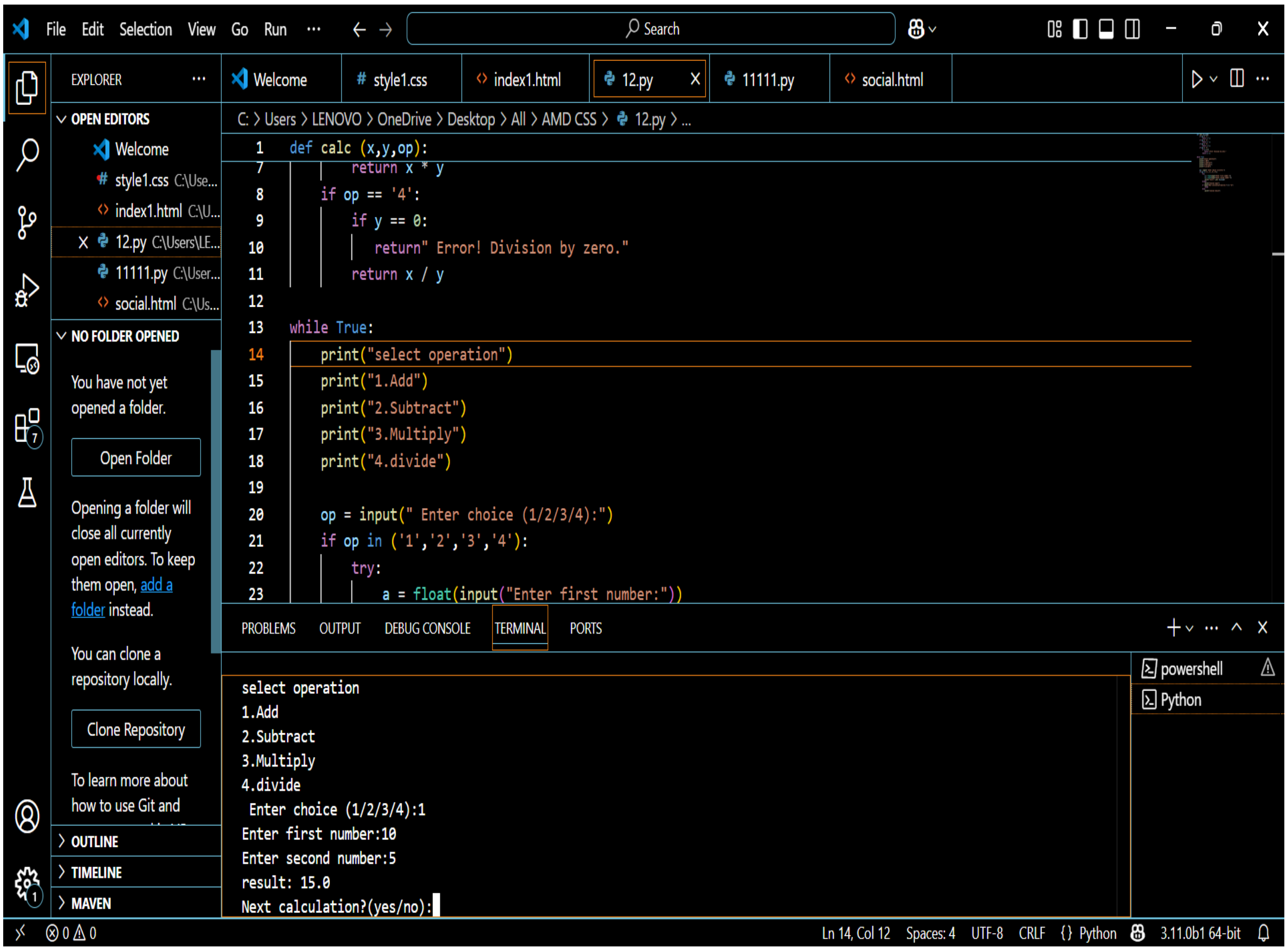
- Codingal. (2023). How to build a basic calculator in Python
- Shiksha. (2024). Calculator Program in Python
- Built In. (2024). How to Make a Python Calculator
- Python.org Documentation. (2024). Python Input and Output

13. Appendices

A. Full Source Code

(See Section 5: Implementation)

B. Additional Screenshots


File Edit Selection View Go Run ···
Search
EXPLORER
OPEN EDITORS
Welcome
style1.css C:\Use...
index1.html C:\U...
12.py C:\Users\LE...
11111.py C:\User...
social.html C:\Us...
NO FOLDER OPENED
You have not yet opened a folder.
Open Folder
Opening a folder will close all currently open editors. To keep them open, add a folder instead.
You can clone a repository locally.
Clone Repository
To learn more about how to use Git and
OUTLINE
TIMELINE
MAVEN
Welcome
style1.css
index1.html
12.py
11111.py
social.html
C: > Users > LENOVO > OneDrive > Desktop > All > AMD CSS > 12.py > ...
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
powershell
Python
Ln 14, Col 12 Spaces: 4 UTF-8 CRLF {} Python 3.11.0b1 64-bit

```python
def calc (x,y,op):
        return x * y
    if op == '4':
        if y == 0:
            return" Error! Division by zero."
        return x / y

while True:
    print("select operation")
    print("1.Add")
    print("2.Subtract")
    print("3.Multiply")
    print("4.divide")

    op = input(" Enter choice (1/2/3/4):")
    if op in ('1','2','3','4'):
        try:
            a = float(input("Enter first number:"))
```

```
select operation
1.Add
2.Subtract
3.Multiply
4.divide
 Enter choice (1/2/3/4):1
Enter first number:10
Enter second number:5
result: 15.0
Next calculation?(yes/no):
```

14. Acknowledgments

I would like to thank my project guide A. Mohammad Fizan, and my faculty members for their guidance and support throughout this project. I also acknowledge the resources and documentation that aided my learning.

Formatting Guidelines

- Font: Times New Roman or Arial, 12 pt (Headings: 14–16 pt)
- Spacing: 1.5 line spacing
- Margins: 1-inch on all sides
- Alignment: Justify text
- Header/Footer: Include project title or chapter name

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