

Ministry of Education of the Russian Federation Penza state university
Department of computer engineering
Explanatory note :

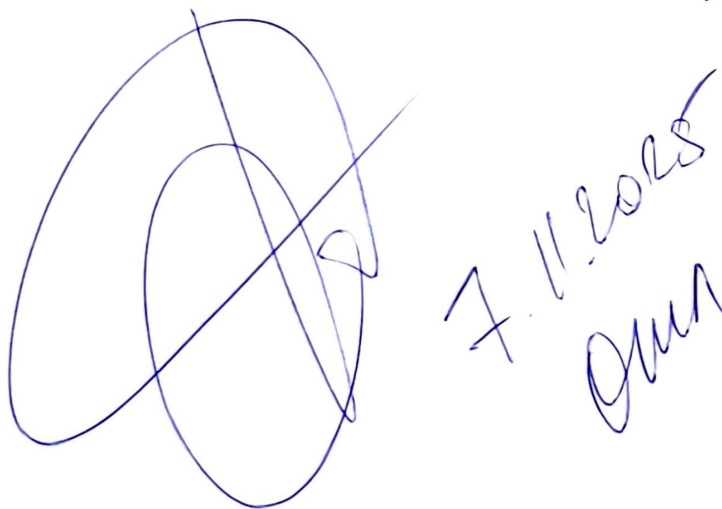
The term paper

In the course: "Programming"
on the topic: "The development of a complex structure program using top-down programming "

Performed by a student of the
24VVIA1 group:

Ouail lotfi

Checked by Fedunin R.N.

A large, stylized handwritten signature in blue ink, followed by the date "7.11.2025" and the word "gum" written below it.

Пенза 2025

PENZA STATE UNIVERSITY

FACULTY OF COMPUTER ENGINEERING

DEPARTEMENT OF COMPUTER ENGINEERING

"I APPROVE"

Head of department of technical education


«__»__20__yrs

Task

for course design according to the course programming

Project topic: developement of a complex structure program using top-down programming

Initial data (technical requirements) for the design

The Calculator is a simple desktop application built using Python and Tkinter.

It allows users to perform basic arithmetic operations such as addition, subtraction, multiplication, and division through an intuitive graphical interface.

The project focuses on simplicity, accuracy, and user-friendly design, showcasing Python's GUI programming capabilities.

Mandatory requirements for the program:

- Data types,
- MySQL integration,
- GUI interface,
- Menu and toolbar,
- Screensaver, and
- Windows and PyCharm environment.

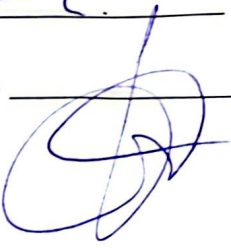
Ouail Lotfi performed the practical task "Calculator in Python".
At the initial stage, the basic principles and logic of calculator operations were studied and analyzed.

The method of solution and the Python programming language were selected, in which a program was written to perform basic arithmetic operations such as addition, subtraction, multiplication, and division.

He also worked with user input and validation, tested and debugged the program to ensure accuracy and error handling (for example, preventing division by zero).

Finally, he prepared the final report describing the calculator's algorithm, implementation details, and testing results.

Bachelor: Ouail Lotfi  " " 2025

Head of practice: Fedunin R.N.  " " 2025

Conclusion

This project successfully achieved its main goals by delivering a functional and user-friendly scientific calculator. I was able to implement both basic and advanced mathematical operations within a clean Tkinter interface. The calculator runs smoothly, provides accurate results, and includes essential features such as error handling to guide users when incorrect inputs occur.

What makes this project effective is its simplicity and versatility, allowing different users—students and professionals—to benefit from it. Completing this work helped me strengthen my programming skills and understand how to build reliable applications. In the future, I plan to add more features such as statistical functions and customizable themes to enhance the overall user experience.

References

1. Mark Lutz. Learning Python. — O'Reilly Media, 2021.
2. Robert Sedgewick, Kevin Wayne. Algorithms in Python. — Addison-Wesley, 2019.
3. Dmitry Zlatopolsky. Programming in Python for Beginners and Professionals. — BHV-Petersburg, 2020.
4. <https://docs.python.org/3/>
5. <https://www.w3schools.com/python/>
6. <https://www.geeksforgeeks.org/python-simple-gui-calculator-using-tkinter/>