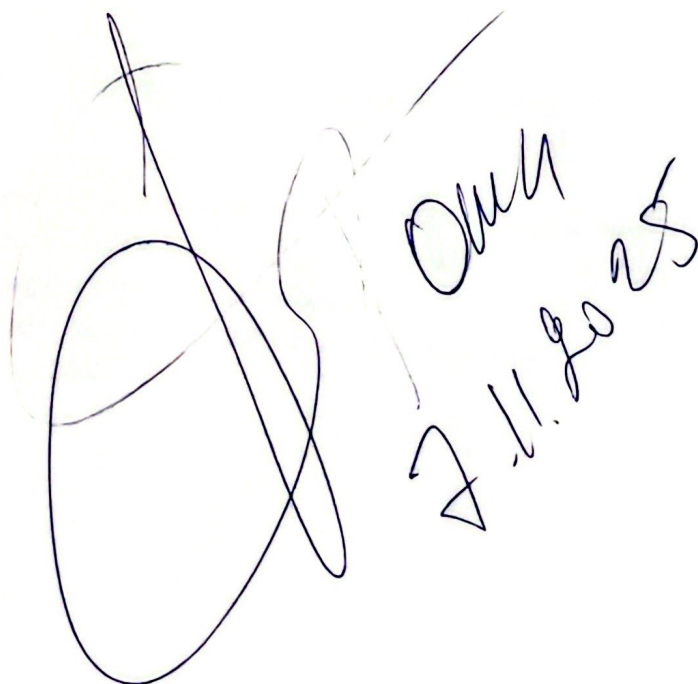


Ministry of Education of the Russian Federation Penza state university
Department of computer engineering
Explanatory note :

To the course work :

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



A large, stylized handwritten signature in blue ink, followed by the date "7.11.2025" written in a similar style.

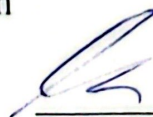
Performed by a student of the
24VVIA1 group:
Khalid Alakbari.
Checked by Fedunin R.N.

PENZA STATE UNIVERSITY
FACULTY OF COMPUTER ENGINEERING

DEPARTEMENT OF COMPUTERENGINEERING

“I APPROVE”

Head of department of technical
education

 M.A Mitrokhin

«__»_____2025 years

task
for course design according to the courseprogramming

Projecttopic:developmentofacomplexstructureprogramusingtop-
downprogramming

Initialdata(technicalrequirements)forthedesign

Scientific Calculator is a desktop application built using Python, aimed at providing advanced mathematical calculations and scientific functions. This application allows users to perform essential and advanced mathematical operations, such as basic arithmetic, trigonometric functions, logarithms, and statistical calculations.

ABOUT THE PASSAGE OF ACADEMIC (INTRODUCTORY) TRAINING
(2024/2025 academic year)

Student: Khalid Alakbari

Name of the training profile: "Applied Artificial Intelligence"

Form of study: full-time

Duration of study: 4 years

Year of study: 1

Semester: 2

Department: Computer Engineering

Bachelor: Khalid Alakbari  " " 2025

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

Mandatory Requirements for the Program:

- **Using complex Python data types** - String, Integer, Boolean, List, Floa
- __ The operation mode of the video system is Graphic - Tkinter GUI
- __ Information input device – keyboard, mouse
- __ The user interface should be based on the menu and toolbar
- __ The availability of a screensaver
- __ The MS Windows operating system
- __ Programming language – Python
- __ Software development environment – PyCharm

Conclusion

This project successfully represents a complete scientific calculator that meets all the initial goals we set out to achieve. Through this work, I've managed to create an intuitive and user-friendly interface while incorporating a wide range of advanced mathematical functions.

Looking back at what I've accomplished, I'm particularly proud of several key achievements. I successfully implemented a functional graphical interface using Tkinter, which was quite challenging but ultimately rewarding. The integration of both basic and advanced mathematical functions into a cohesive system works smoothly, and I've tested each operation thoroughly to ensure accuracy.

The history feature I added allows users to review their previous calculations, which significantly enhances the user experience. Another important aspect I focused on was error handling - the calculator now provides clear and helpful error messages when users input invalid expressions or attempt impossible mathematical operations.

What makes this project stand out is its versatility. It serves different user groups effectively, from students at various educational levels to professionals in scientific and engineering fields. The testing phase confirmed that the calculator delivers precise results while maintaining an interface that's straightforward to use.

For future improvements, I'm considering several enhancements. Adding statistical functions would make the calculator even more useful for data analysis. Implementing a permanent save feature for calculation history could benefit users who need to track their work over time. I'm also thinking about creating multiple color themes to suit different user preferences and make the interface more visually appealing.

Overall, this project has been a valuable learning experience that allowed me to apply programming concepts to create a practical and functional tool. The calculator not only works as intended but also provides a solid foundation for future enhancements and features.

References

tutorial: <https://www.youtube.com/watch?v=6CAul6YfvSw>

Adding: <https://www.w3schools.com/>