Matrix Calculator

1 Introduction

Matrix mathematics plays a fundamental role in a wide range of scientific and engineering fields, from using the matrix algebra various complex problems can be solved easily. At some stages the operations may take very complex and lengthy calculation to solve.To address the growing need for a versatile and user-friendly matrix calculator, I present the "Matrix Calculator" project.

1.1 Project Overview

The Matrix Calculator is a versatile tool designed to perform a wide range of matrix operations, simplifying complex mathematical tasks involving matrices. This project was developed to provide an accessible and efficient solution for working with matrices.

1.2 Purpose and Significance

Matrix operations, such as addition, subtraction, multiplication, and the determination of properties like symmetry and orthogonality. The Matrix Calculator project aims to:

- Provide a user-friendly terminal based interface for performing essential matrix operations.
- Offers various matrix operations related to its algebra and properties.
- Serve as an educational resource, helping students and learners grasp the principles of matrix mathematics.

With the Matrix Calculator, users can save their time, and eliminate the potential for human error in manual calculations. This documentation comprehensively explains the functionalities of the Matrix Calculator, how to use it, and the mathematics behind each operation.

2 Functionality

This project computes following these tasks on matrix:

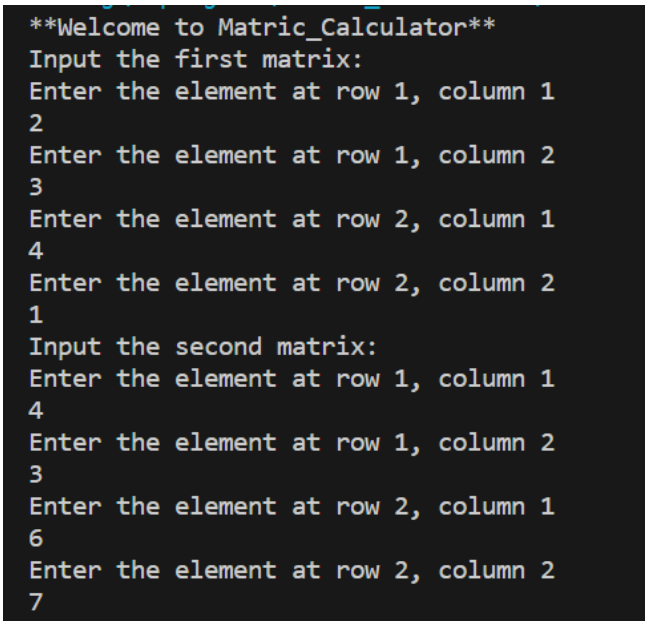

Figure 1: Matrix Calculator in action - Input

- Matrix addition
- Matrix subtraction
- Matrix multiplication
- Transpose of a matrix
- Inverse of a matrix
- Square matrix
- Symmetric matrix check
- Skew-symmetric matrix check
- Orthogonal matrix check

3 Screenshots

This section shows the screenshots of output terminal and demonstrate how the user will interact with the project and insert a matrix and can perform desired operation.

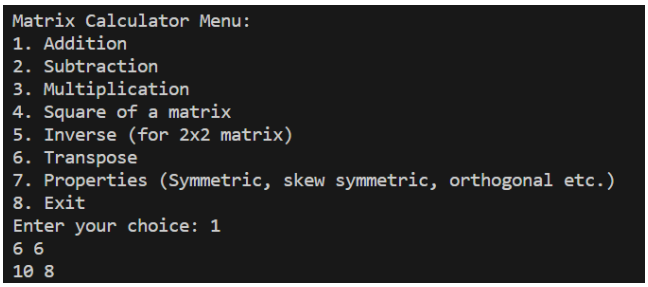

Figure 2: Matrix Calculator in action - Addition

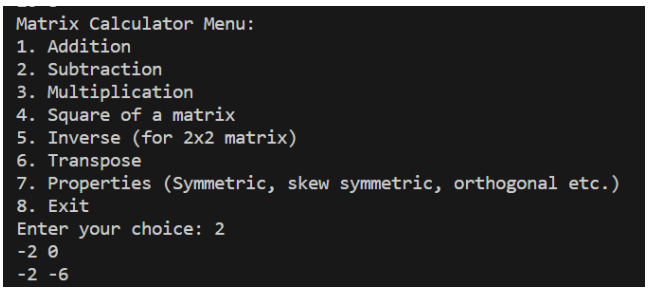

Figure 3: Matrix Calculator in action - Subtraction

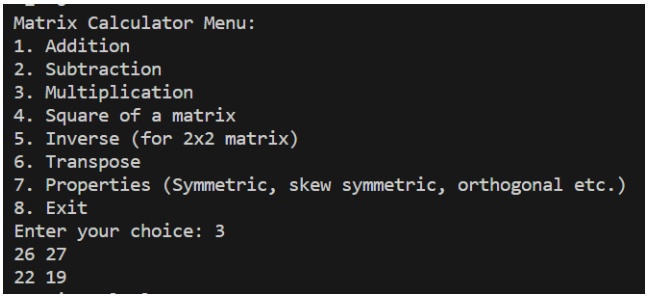

Figure 4: Matrix Calculator in action - Multiplication

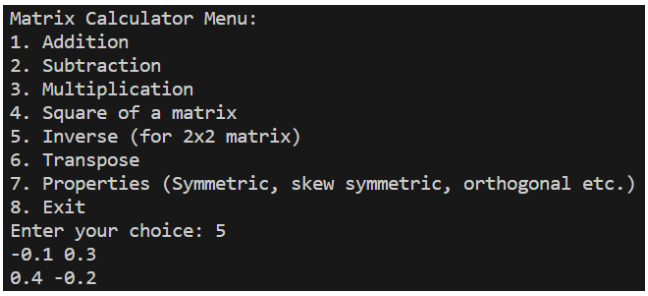

Figure 5: Matrix Calculator in action - Inverse

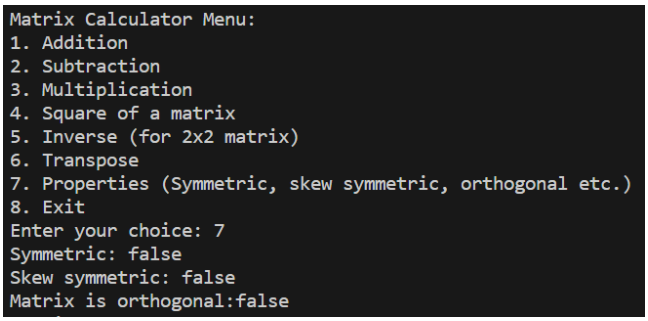

Figure 6: Matrix Calculator in action - properties

4 Conclusion

Although this project is performing important operation of matrix but it can be expanded for the wider range of tasks as rank, eigen values, system of linear equations etc.