Product requirement document

Software title: Matrix Calculator

Background and motivation:
Matrix calculations are a fundamental aspect of many scientific and engineering fields, including physics, chemistry, and computer science. This software aims to provide users with an easy-to-use, comprehensive matrix calculator that can perform a wide range of calculations, from basic operations such as rank and RREF, to more advanced calculations such as matrix inverse and eigenvalue decomposition. The software is designed to be user - friendly and intuitive, with a simple interface that allows users to quickly and easily perform complex calculations. In the field of building construction, mathematical calculations are an essential part of the design and construction process.
Matrix calculation is also a fundamental tool in linear algebra, which is widely used in engineering and physics. Therefore, a matrix calculator can help engineers and physicists to solve the matrix problems in their work.

Key functions:
- Matrix transpose
- Determinant calculation
- Matrix determinant
- Matrix inversion
- Matrix reduced row echelon form(RREF)
- Trace calculation
- Rank calculation
- Eigenvalue and eigenvector

calculation **Algorithm/scientific methods:**

The software uses the SymPy library, a Python library for symbolic mathematics. SymPy provides a wide range of mathematical functions, including matrix operations, linear algebra, and calculus. The software makes use of SymPy's matrix class and its various methods to perform calculations such as matrix inverse, determinant, eigenvalue and eigenvector, and matrix decomposition.

Similar products in the market:

- Matlab
- Octave
- SageMath
- Scilab