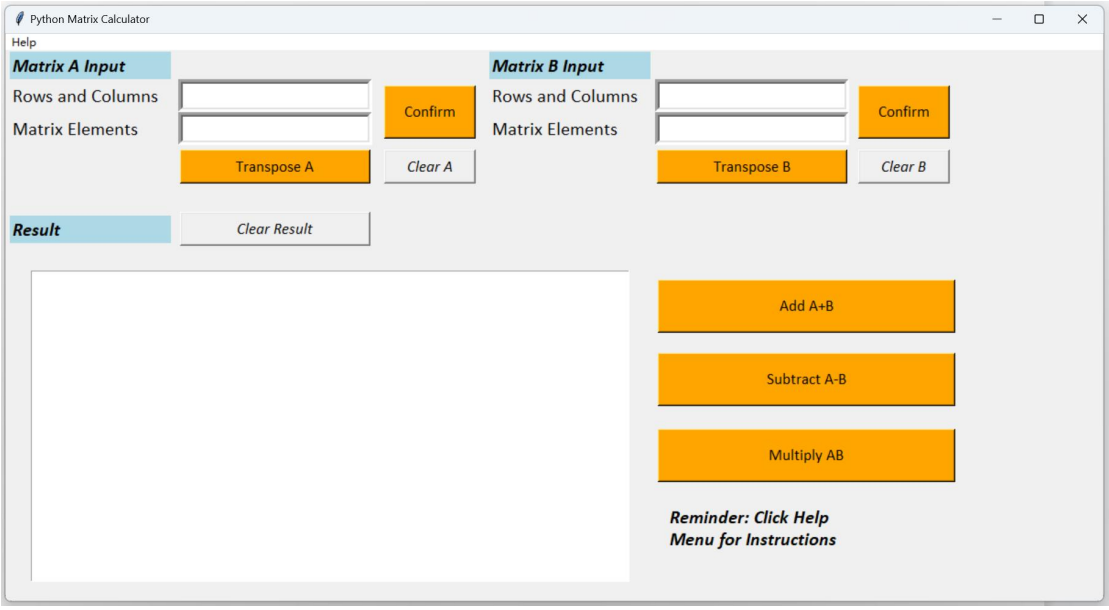
Software User Guide

Environment dependencies

- The software has to be run under Python 3 environment.
- A python package, “Tkinter”, must be installed in advance.
- Windows system is recommended for running.

Software Interface



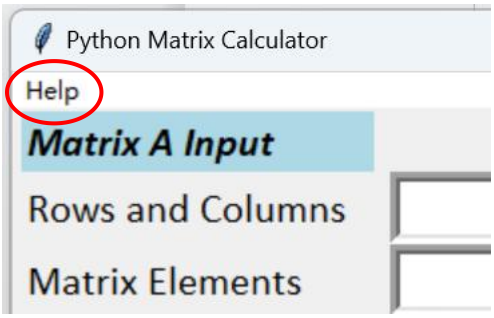
- **Layout**

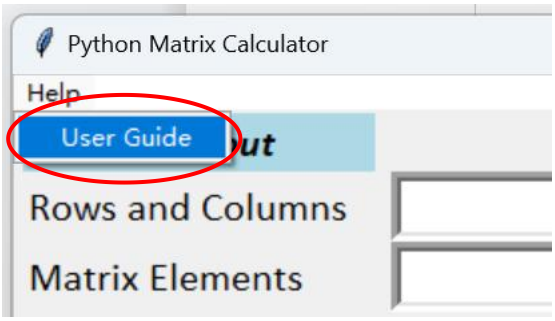
Part 1 *Matrix A Input*	Entries for the content of Matrix A
Part 2 *Matrix B Input*	Entries for the content of Matrix B
Part 3 *Result*	Display of processing results.
Part 4 *Operation Buttons*	Buttons to manipulate matrix calculations.

- **Button**

Confirm Buttons	“Confirm”	Confirm the inputs of matrices.
Clear Buttons	“Clear A/B”	Clear corresponding matrix content.
	“Clear Result”	Clear all processing results.
Matrix Operation Buttons	“Transpose A/B”	Transpose corresponding matrix.
	“Add A+B”	Addition of matrix A and matrix B.
	“Subtract A-B”	Subtraction of matrix A and matrix B.
	“Multiply AB”	Multiplication of matrix A and matrix B.

- **Dropdown Menu**



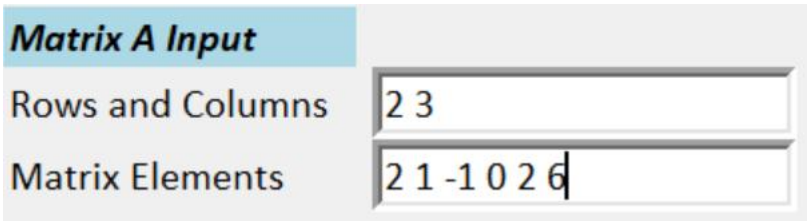


Click “User Guide” under the “Help” menu, a simple version of instruction for this software will be poped up. Users can look through it as an operating reminder.

Step Guidelines for Usage

- **Important Notice 1**
  1. The inputs of matrix have to be integers.
  2. The two adjacent numbers must be separated by a space.
  3. The elements should be input from matrix top left to right bottom in row order.

     For example, a 2 by 3 matrix $\begin{bmatrix} 2 & 1 & -1 \\ 0 & 2 & 6 \end{bmatrix}$ should be input as below:



- **Important Notice 2**
  1. The inputs of Matrix A and Matrix B should be the same dimension for addition and subtraction.
  2. The column number of Matrix A should be the same as the row number of Matrix B for multiplication.
  3. **The inputs of matrix must be confirmed by Button "Confirm" before any operation.**

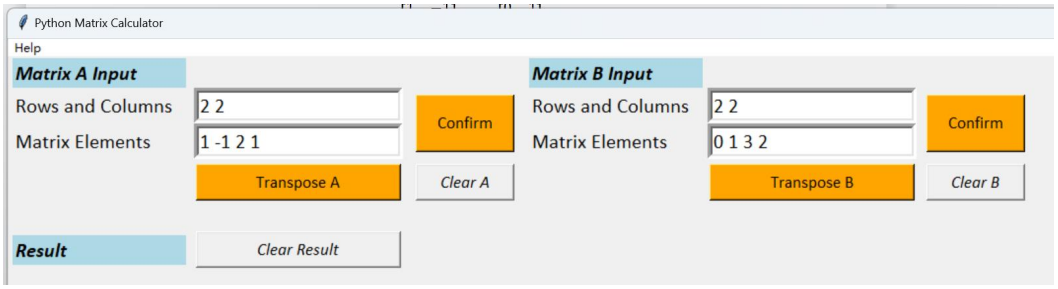
- **Specific Example**

  Using two matrices below as a demonstration:

$$A = \begin{bmatrix} 1 & -1 \\ 2 & 1 \end{bmatrix}, B = \begin{bmatrix} 0 & 1 \\ 3 & 2 \end{bmatrix}$$

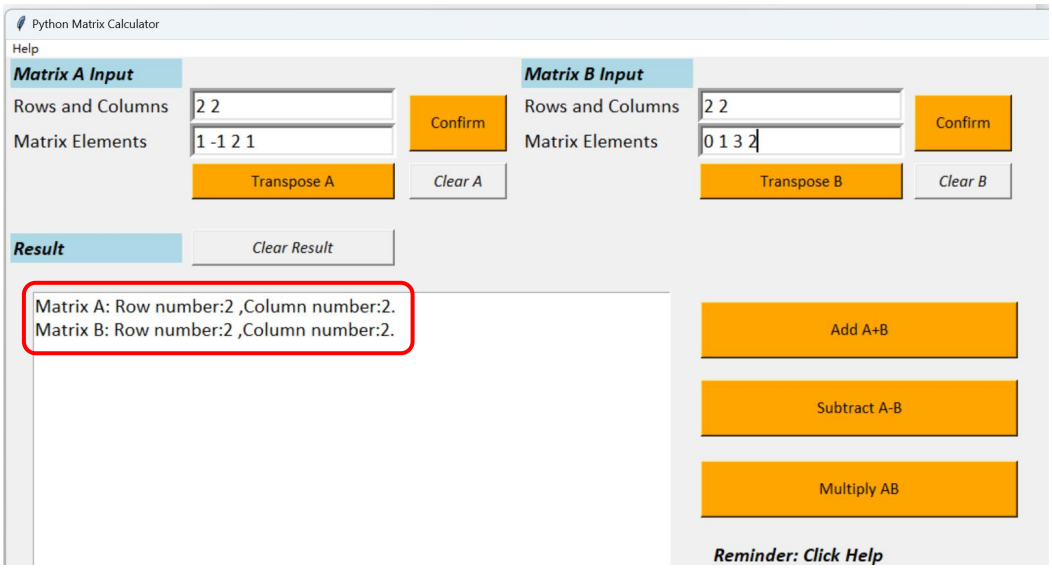
Step 1. Input two matrices

Enter the number of rows and columns, and elements for both matrices with separating space between any two values.



Step 2. Confirmation

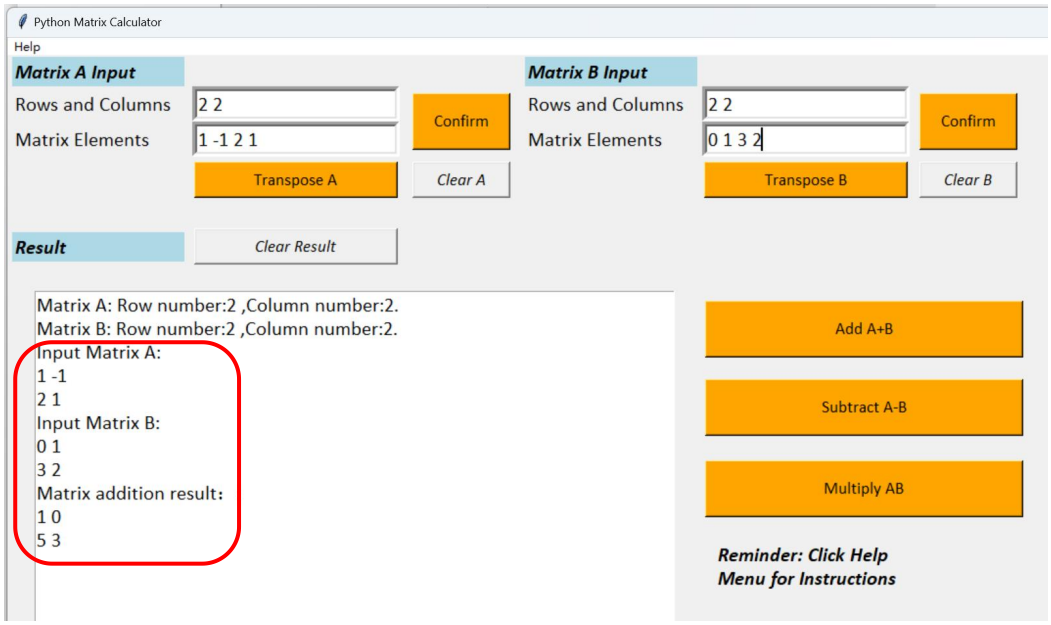
Click the “Confirm” buttons and two lines of text will appear within result section, indicating that the matrices are successfully entered.



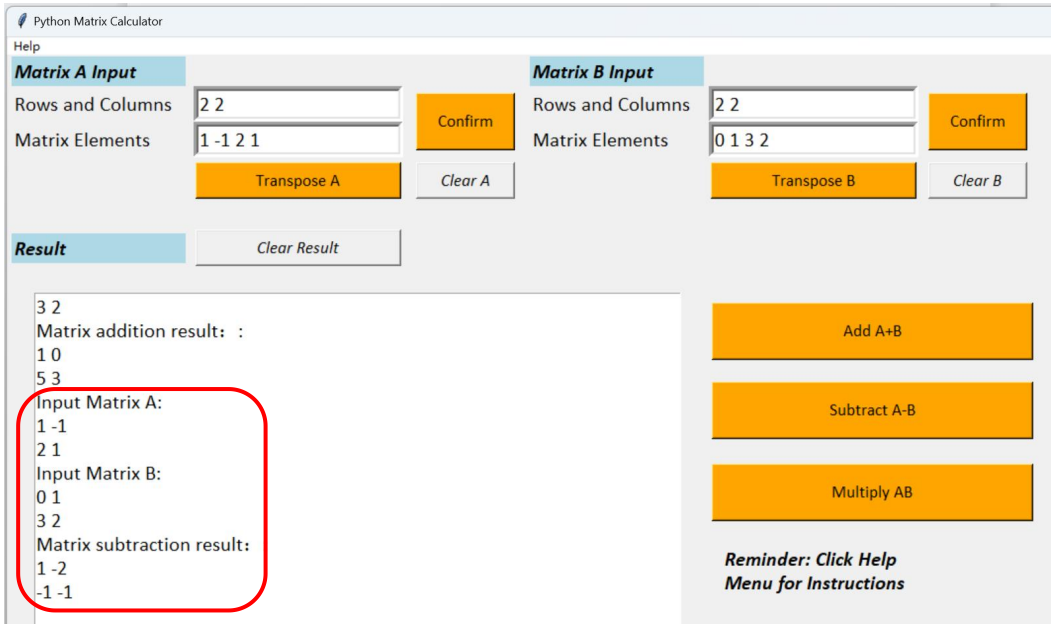
Step 3. Conduct Matrix Operation

Press the relevant buttons to process different operations of the matrices.

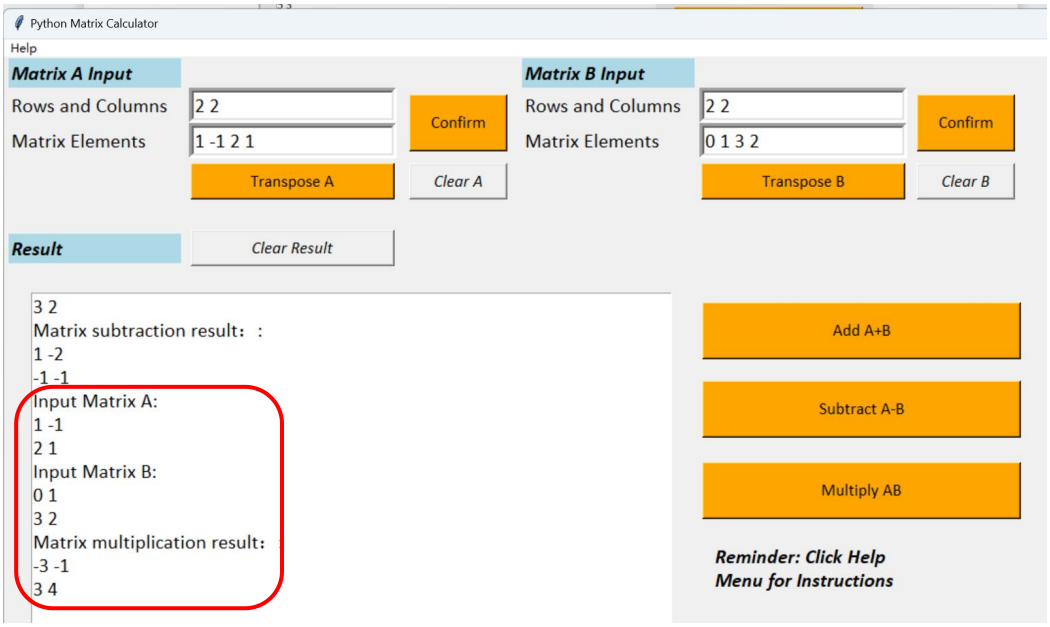
Addition:



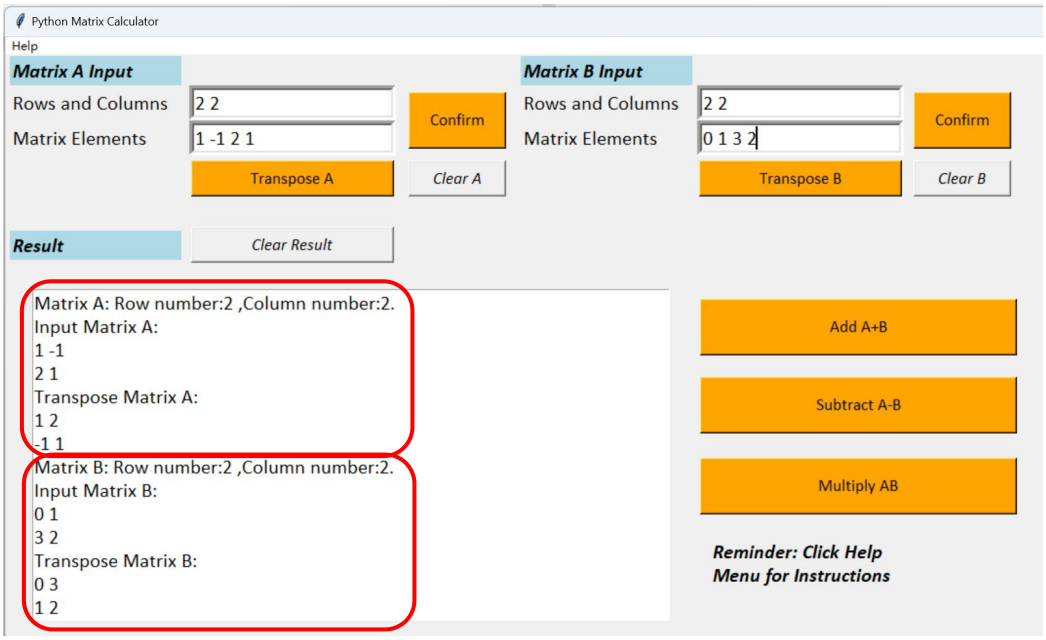
Subtraction:



Multiplication:

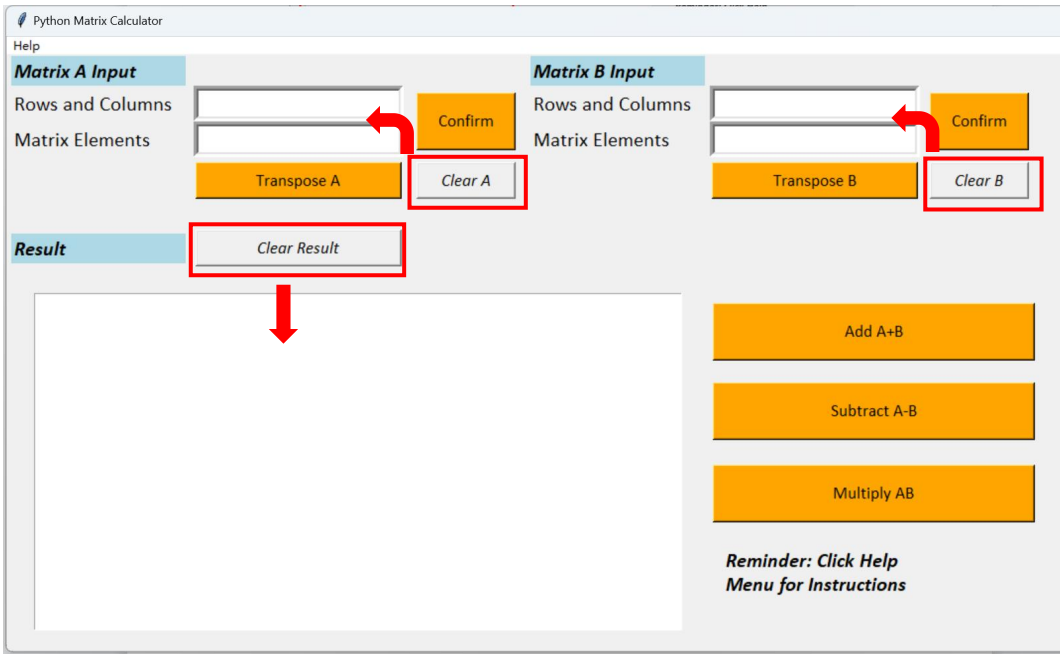


Transposition:



Step 4. Clear

Using clear buttons to delete inputs of matrices and results history for new round operations.



P.S. Error Notice

If the inputs of matrices are not followed by the principle of matrix operations, for example, input dimensions for matrix A and matrix B are not the same when adding or subtracting, an error notice will appear as below.