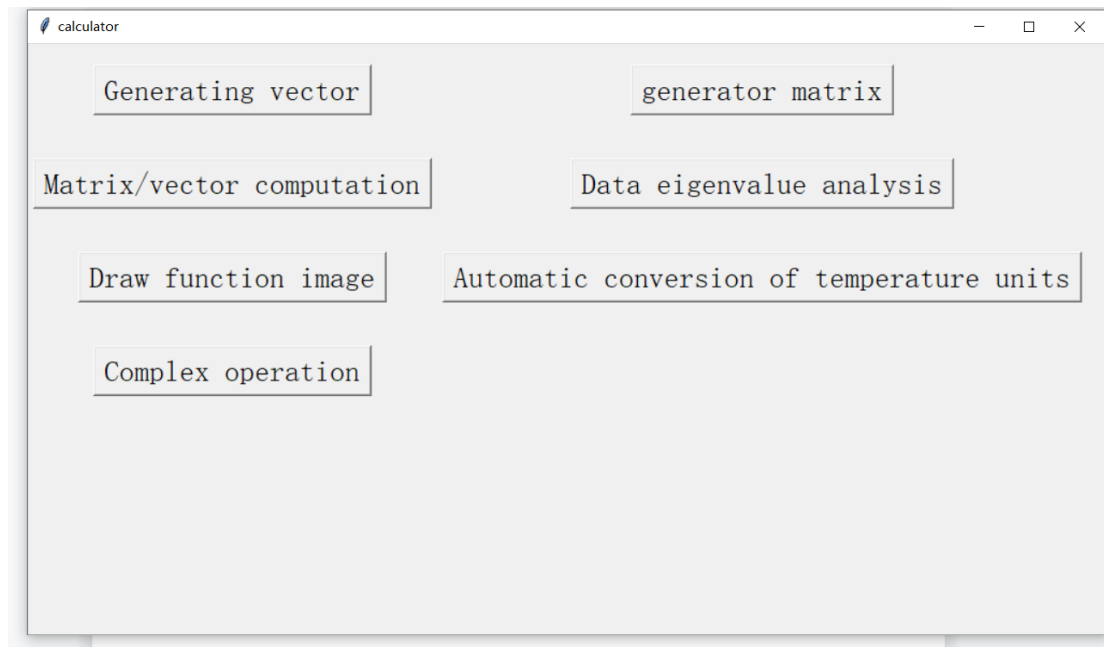
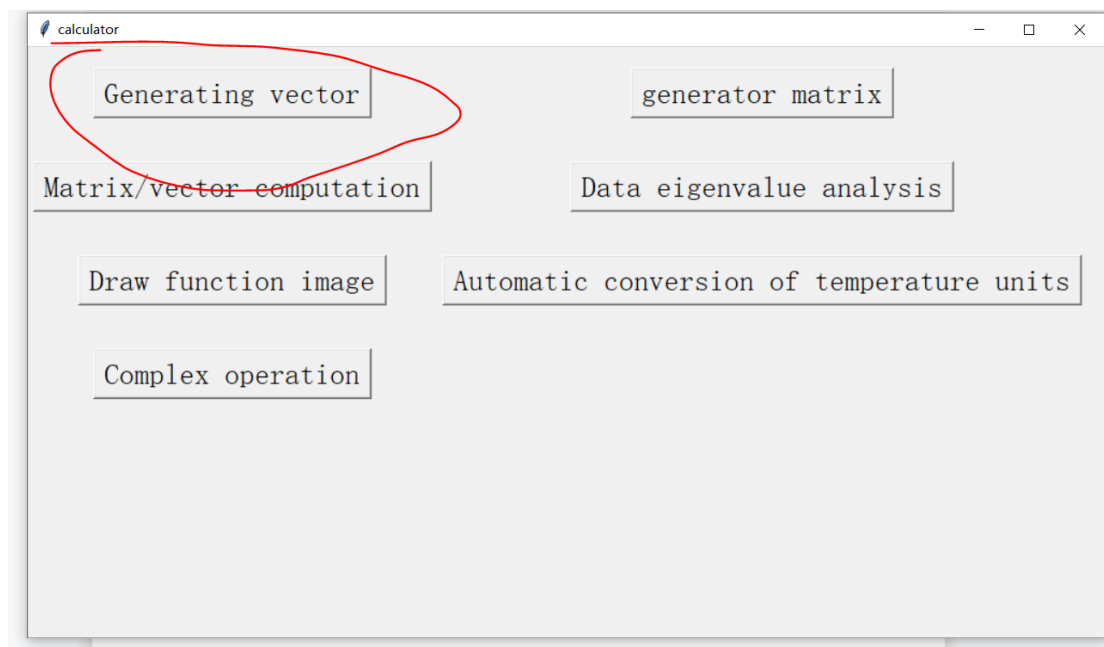


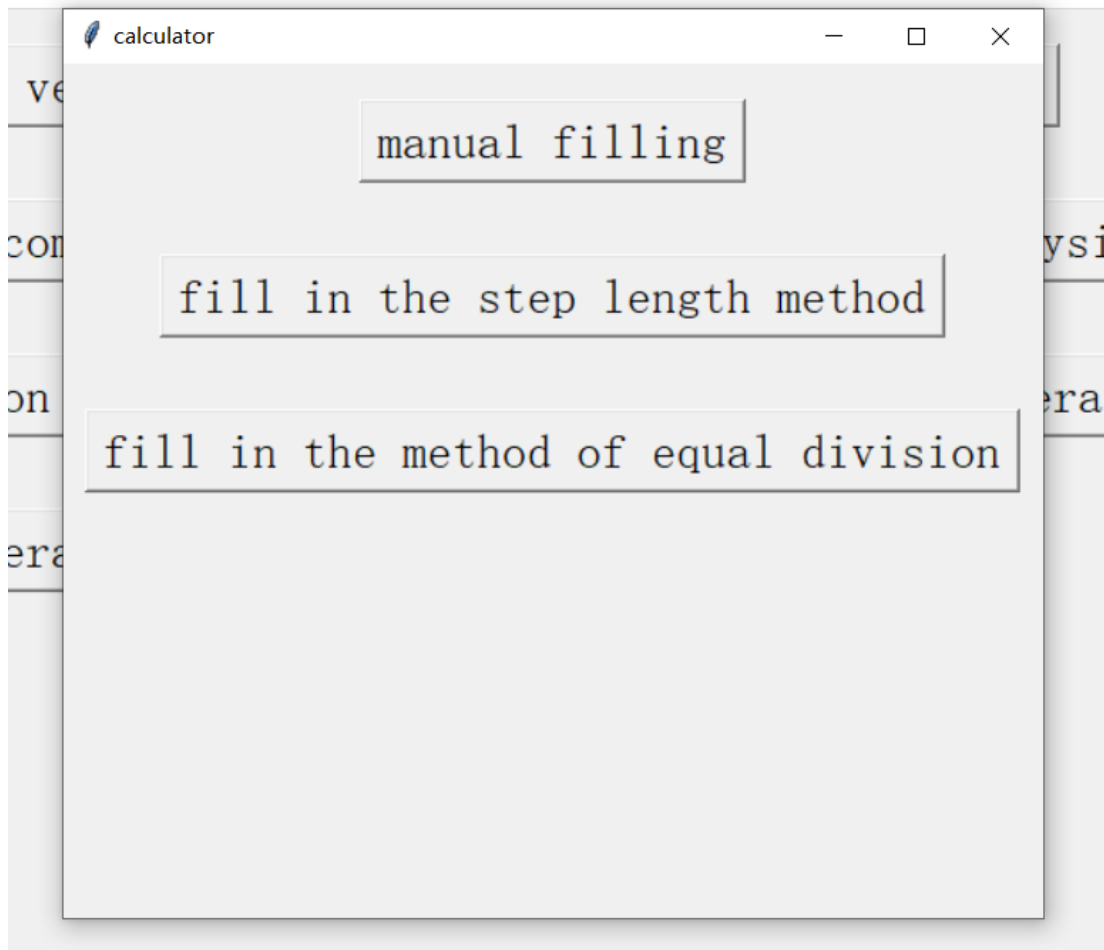
The computer interface is shown in the figure

The software uses the following libraries:  
numpy,matplotlib,scipy,tkinter,math



- 
- **Function 1: Generate vector**
- 





- 
- 

1. Manually enter:

calculator

fill in vector numbers  
(Enter one numbers at a time and Fill once):

log in finish

vector is:

```
[['1' '2' '3' '4' '5']]
```

## 1. Fill in the vector in step length method

calculator

origin: 0

final(This figure is not included): 10

step size: 1

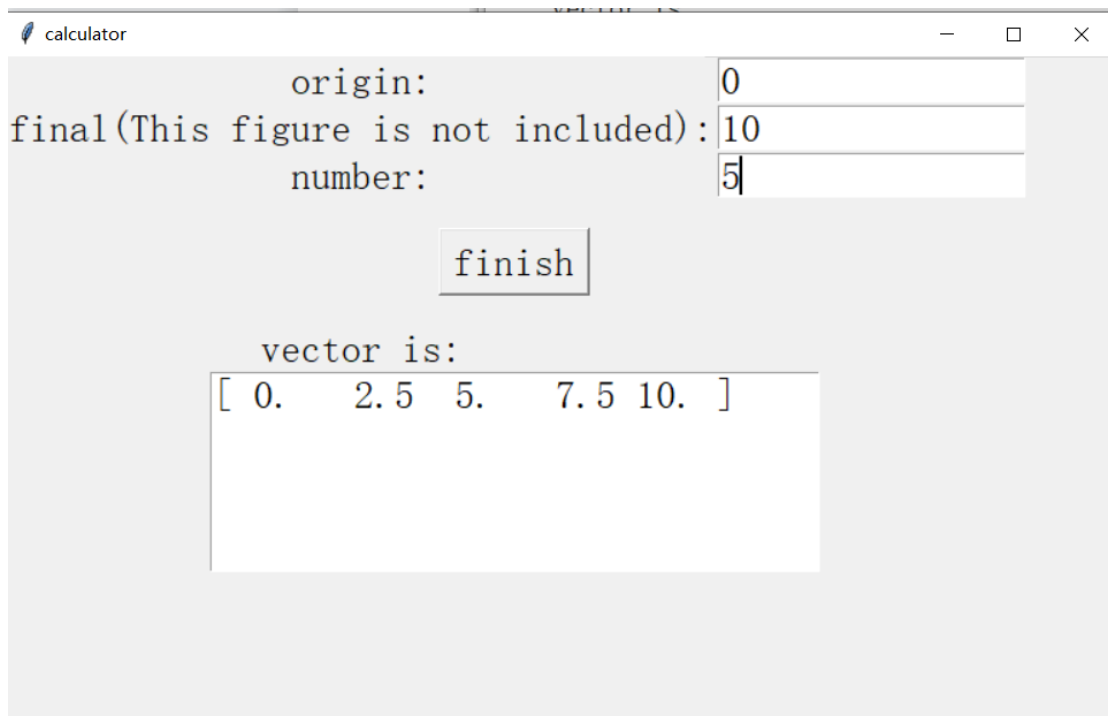
finish

vector is:

```
[0 1 2 3 4 5 6 7 8 9]
```

## 2. Fill in the vector in the bisection method

- 

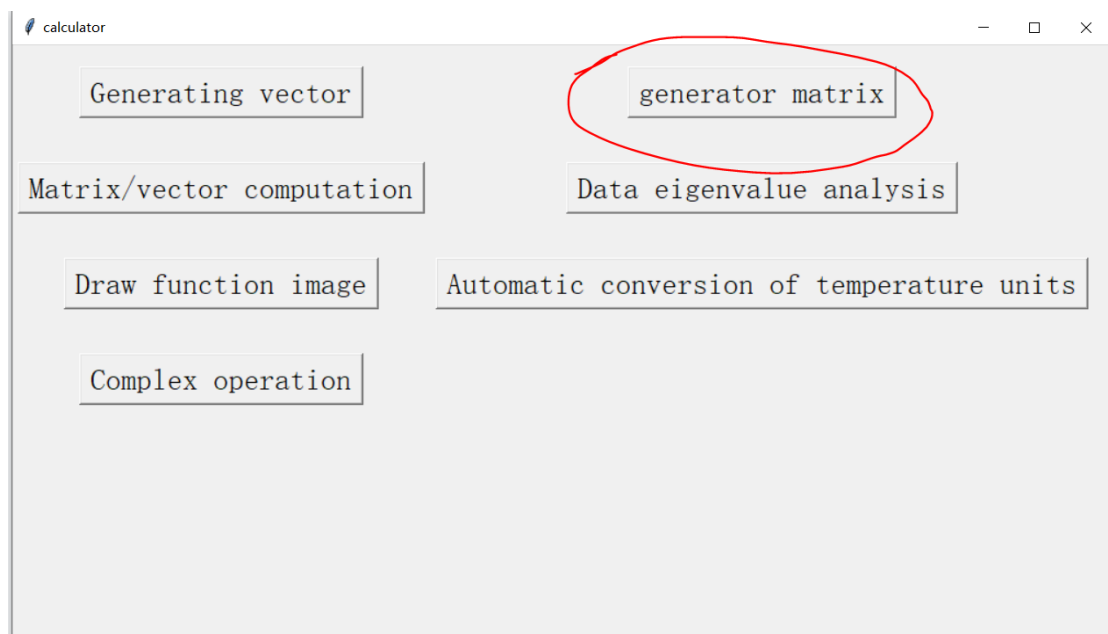


A calculator window titled "calculator" with standard window controls. It contains a form for the bisection method. The "origin:" field is set to 0, the "final(This figure is not included):" field is set to 10, and the "number:" field is set to 5. A "finish" button is located below these fields. Below the button, the text "vector is:" is followed by a display area showing the array  $[0. \quad 2.5 \quad 5. \quad 7.5 \quad 10.]$ .

- 

## Function 2: Generate and process the matrix

- 



A calculator window titled "calculator" with standard window controls. It displays a menu of function options: "Generating vector", "generator matrix", "Matrix/vector computation", "Data eigenvalue analysis", "Draw function image", "Automatic conversion of temperature units", and "Complex operation". The "generator matrix" option is circled in red.



- 
- 

1. Manually enter the matrix

stuffing digit  
(Press once for each number entered):

log in | Combine into a one-line array | finish

output:

```
[[1 2 3]
 [4 5 6]
 [7 8 9]]
```

Output the transpose matrix

Outputs the determinant of the matrix

- 

The output transpose matrix

-

calculator

stuffing digit  
(Press once for each number entered):

log in | Combine into a one-line array | finish

output:

```
[[1 4 7]
 [2 5 8]
 [3 6 9]]
```

Output the transpose matrix

Outputs the determinant of the matrix

- 
- 

The value of the output determinant:

calculator

stuffing digit  
(Press once for each number entered):

log in Combine into a one-line array finish

output:

Output the transpose matrix

Outputs the determinant of the matrix

Create a random matrix

calculator

The number of rows in this matrix:

The number of columns of the matrix:

finish

vector is:

The output transpose matrix

Outputs the determinant of the matrix



calculator

The number of rows in this matrix:

The number of columns of the matrix:

vector is:

$$\begin{bmatrix} 0.41121324 & 0.93659575 \\ 0.84251747 & 0.97793768 \end{bmatrix}$$

The output transpose matrix

Outputs the determinant of the matrix

## Create an all-in-one matrix

calculator

The number of rows in this matrix:

The number of columns of the matrix:

vector is:

$$\begin{bmatrix} 1. & 1. & 1. & 1. \\ 1. & 1. & 1. & 1. \\ 1. & 1. & 1. & 1. \\ 1. & 1. & 1. & 1. \end{bmatrix}$$

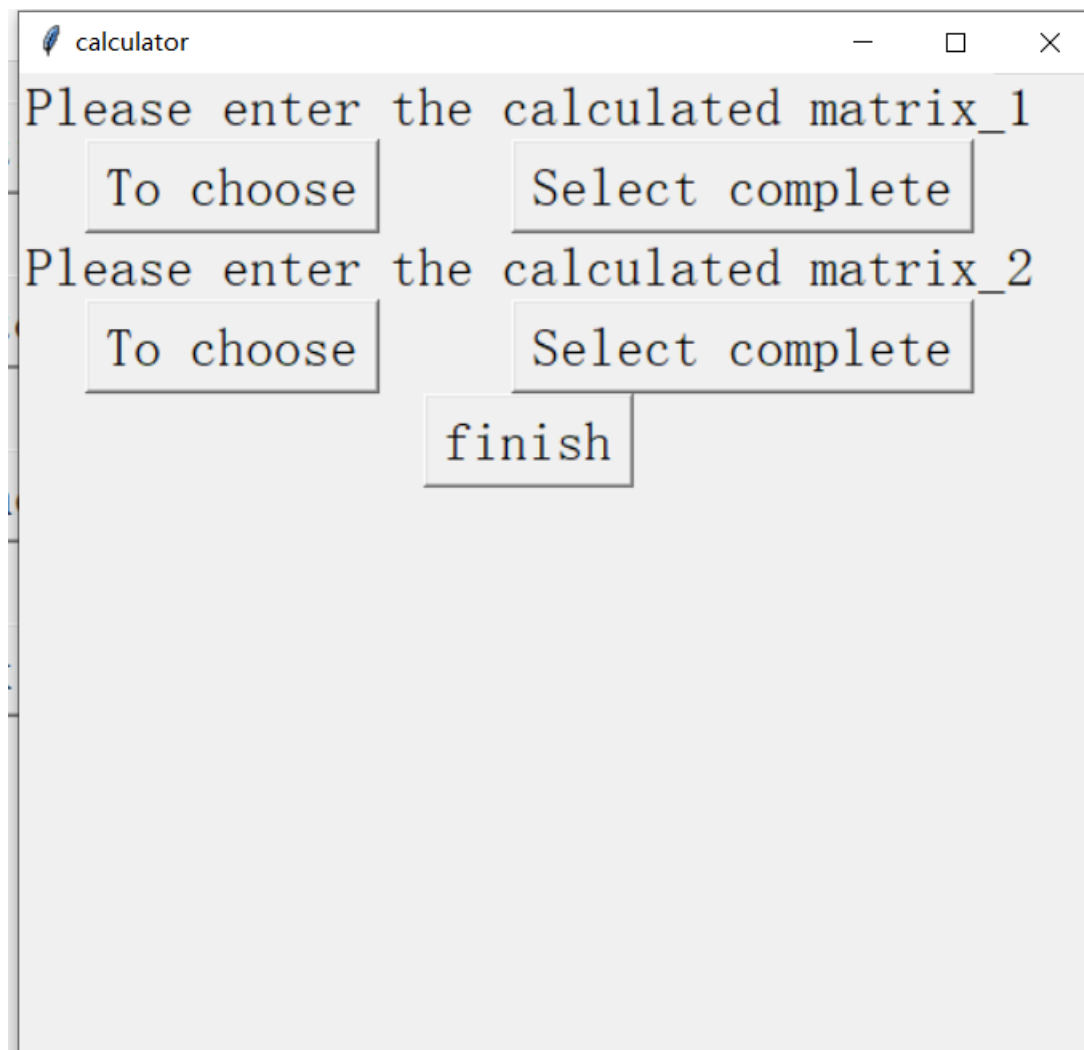
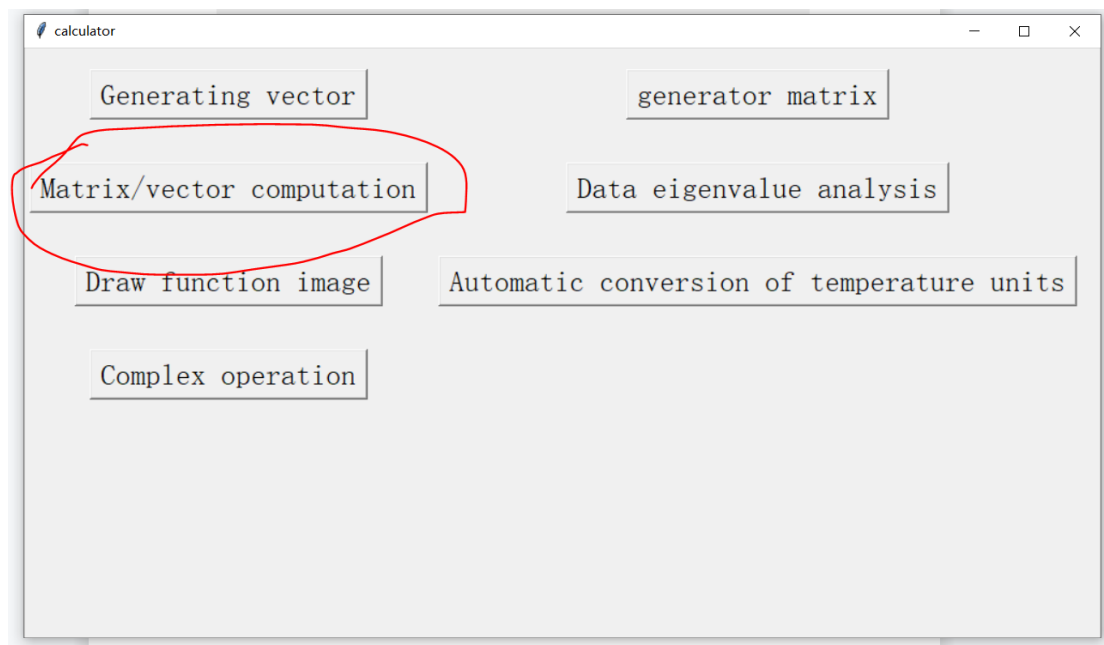
The output transpose matrix

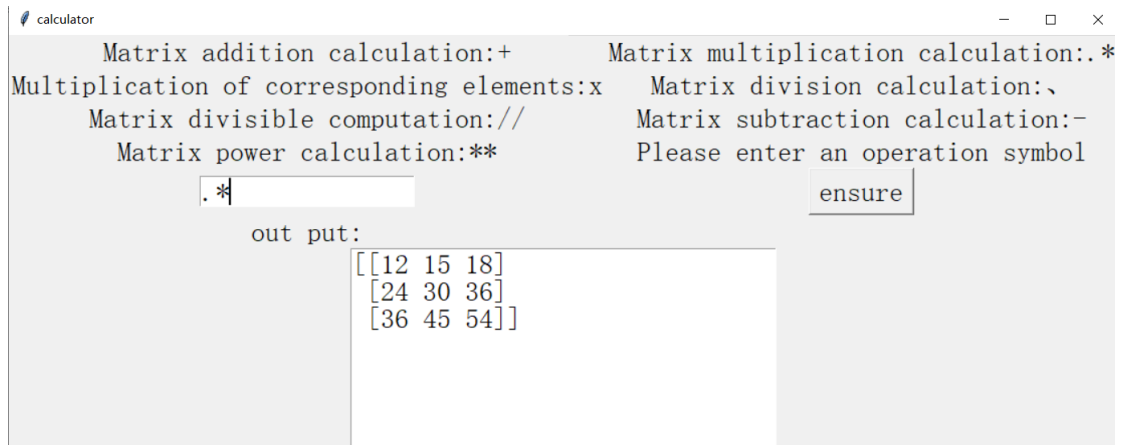
Outputs the determinant of the matrix

•

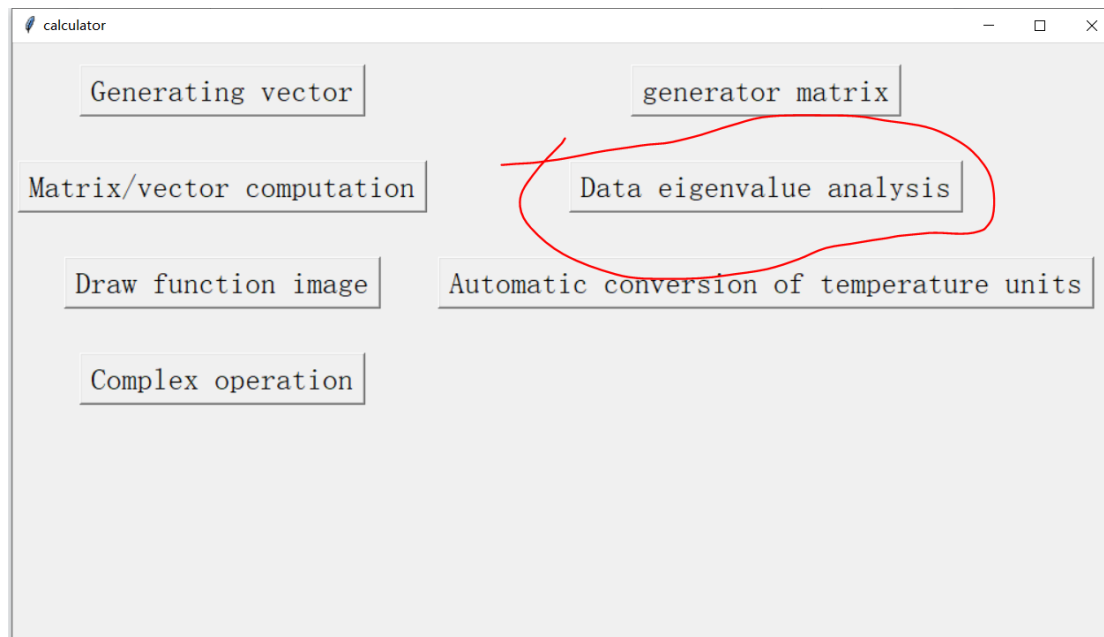
## Function 3: Matrix calculation

•





## Function four: statistical data processing



calculator

Enter the data you want to calculate

The average value is:

The variance is:

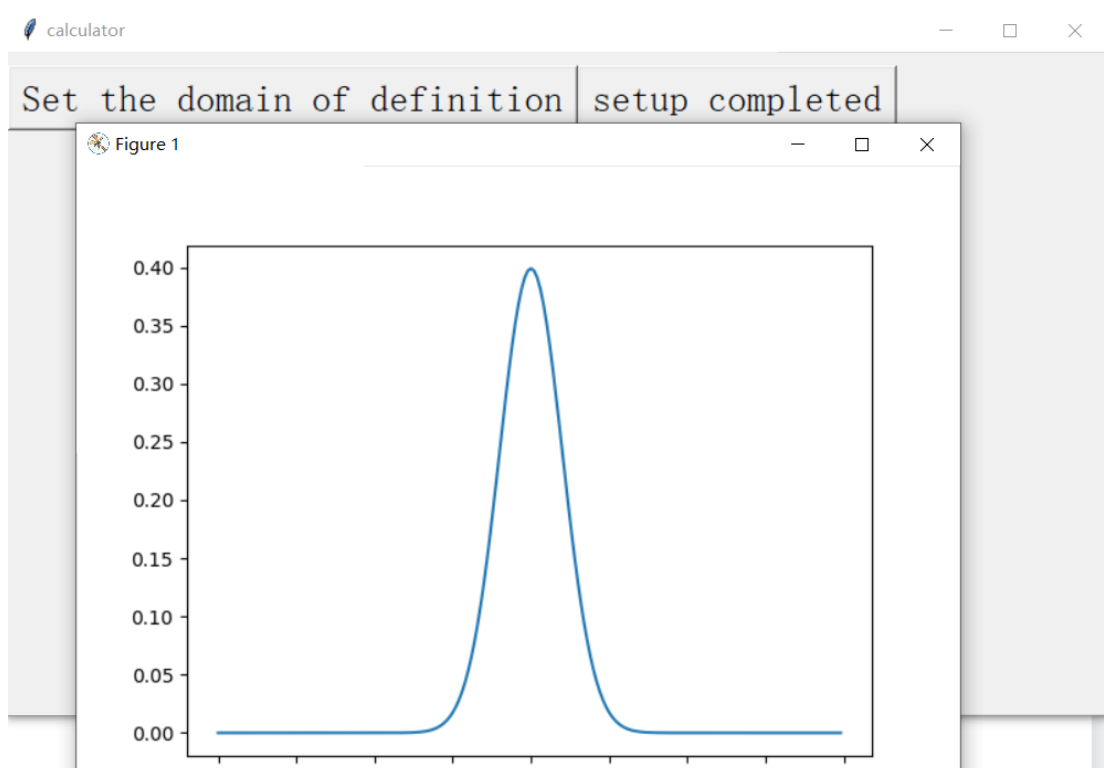
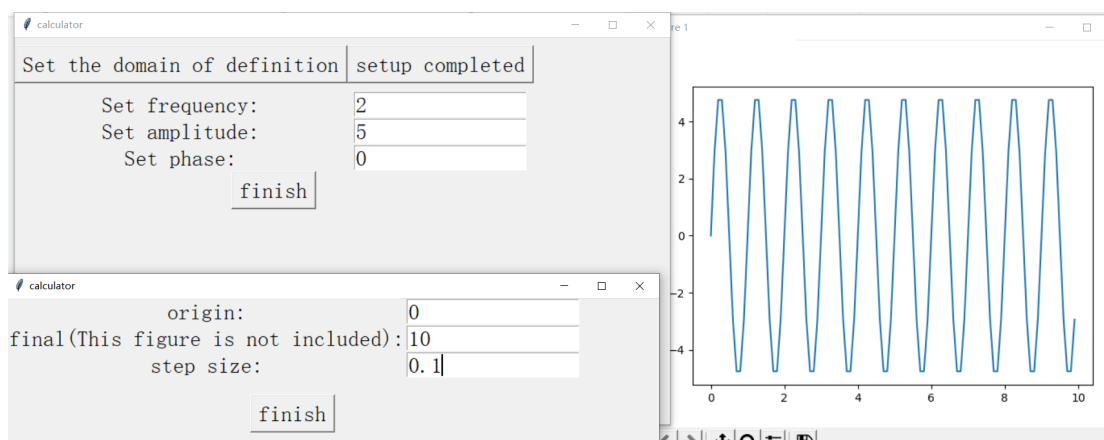
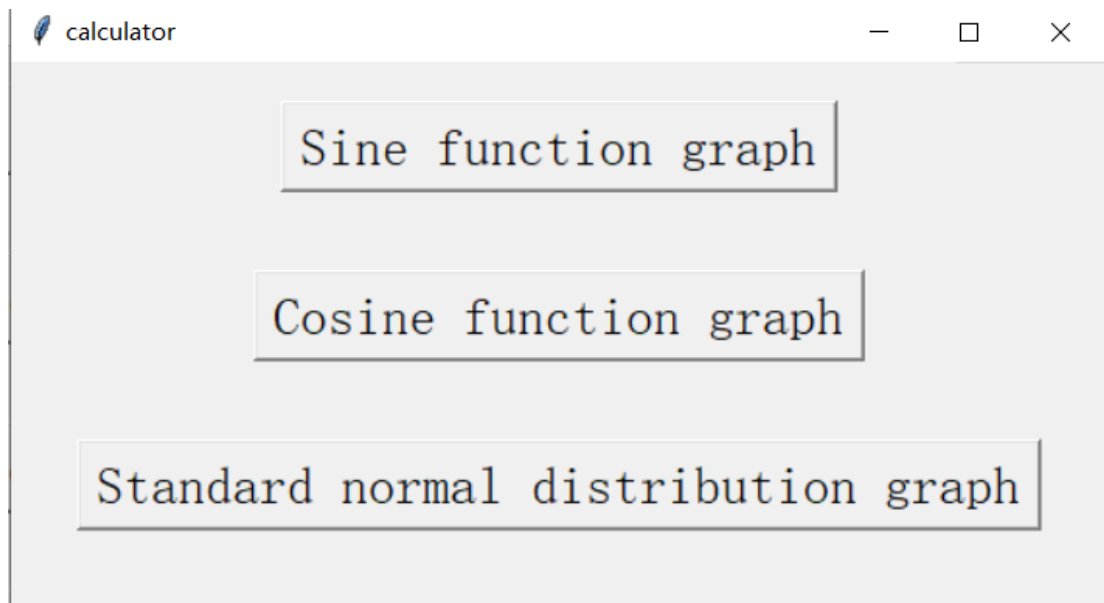
The median is:

- 

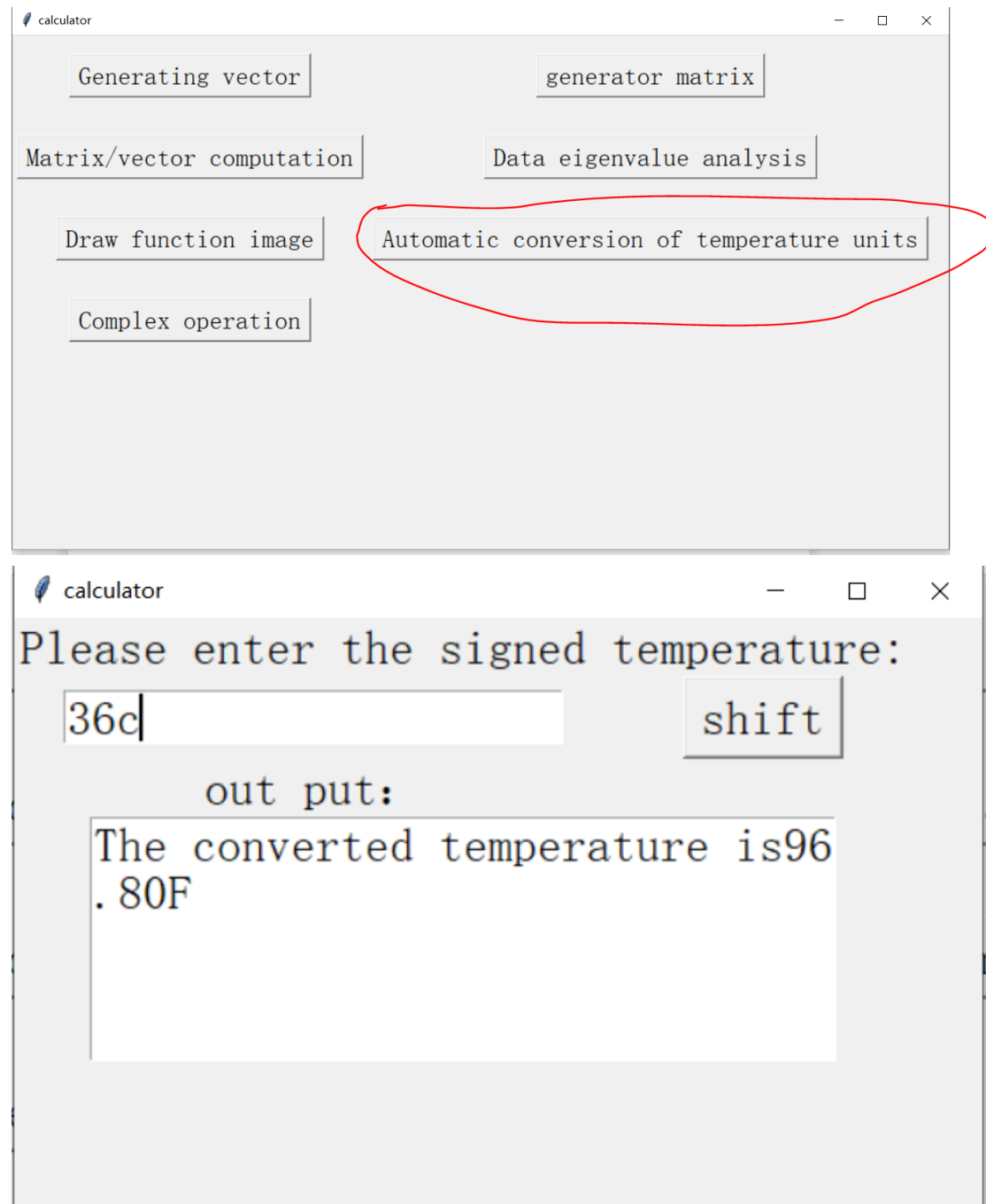
## Function five: function image rendering

- 

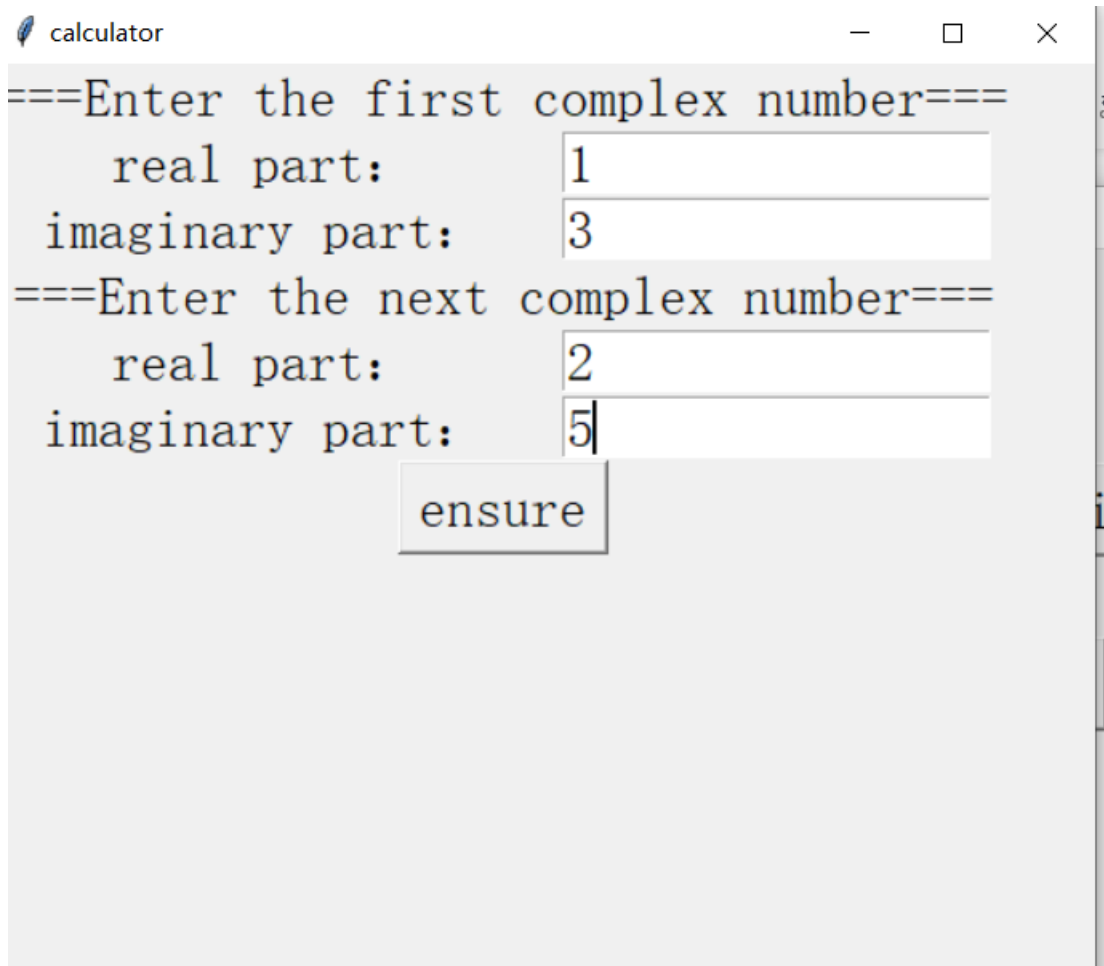
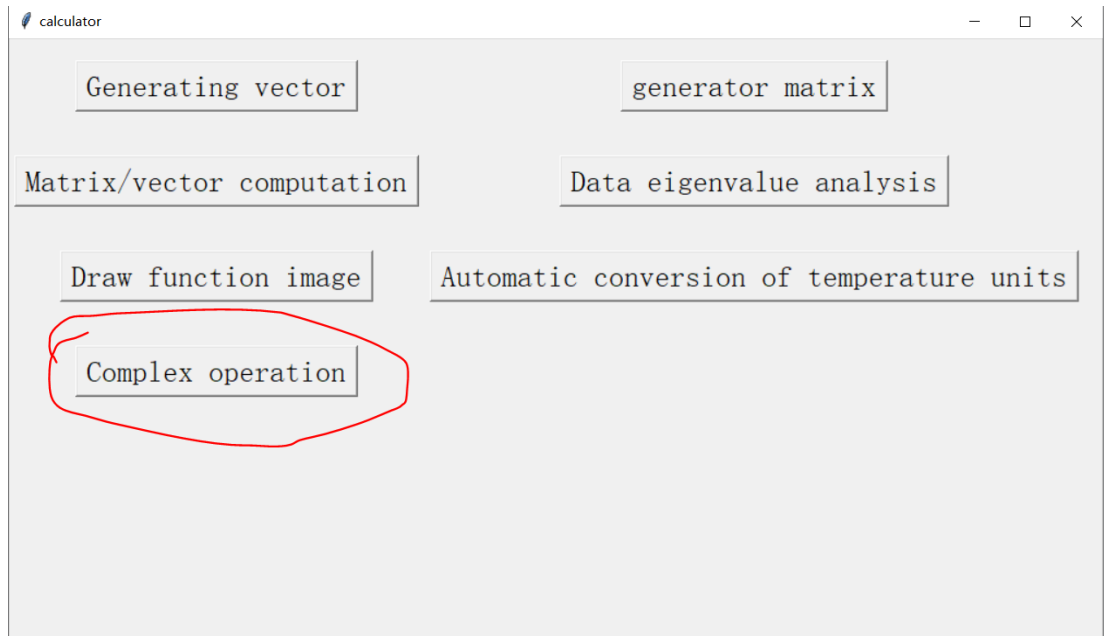
calculator



- **Function 6: automatic conversion of temperature units**



- **Function 7: Operation of complex numbers**



===The operation you want to perform===  
addition(0);subtraction(1);multiplication(2);Division(3);exit(4)

The result of the multiplication is: