

BSE17071 GD1M02 Mathematics for Graphical Games	Summative Assignment Final Project (Weightage: 50%)	Issue Date: 11th May 2018
		Submission Dates for Calculators: Matrix: 23rd May '18 Quaternion: 30th May '18 Gaussian: 6th June '18 Slerp: 13th June '18 Transformation: 20th June '18

Submission filenames:

Matrix Calculator - Student Name.zip
Quaternion Calculator - Student Name.zip
Gaussian Eliminator - Student Name.zip
Slerp Calculator - Student Name.zip
Transformation Matrices - Student Name.zip

Overview:

This project requires you to develop a number of calculators as specified herein.
 Each calculator carries 10 marks.
 The project can either be done individually or in groups of 2.

Matrix Calculator

Project name: Matrix Calculator - Student Name.zip

Write an application that allows the user to input two matrices (A and B), and then performs the various operations on them as shown in Figure 1.

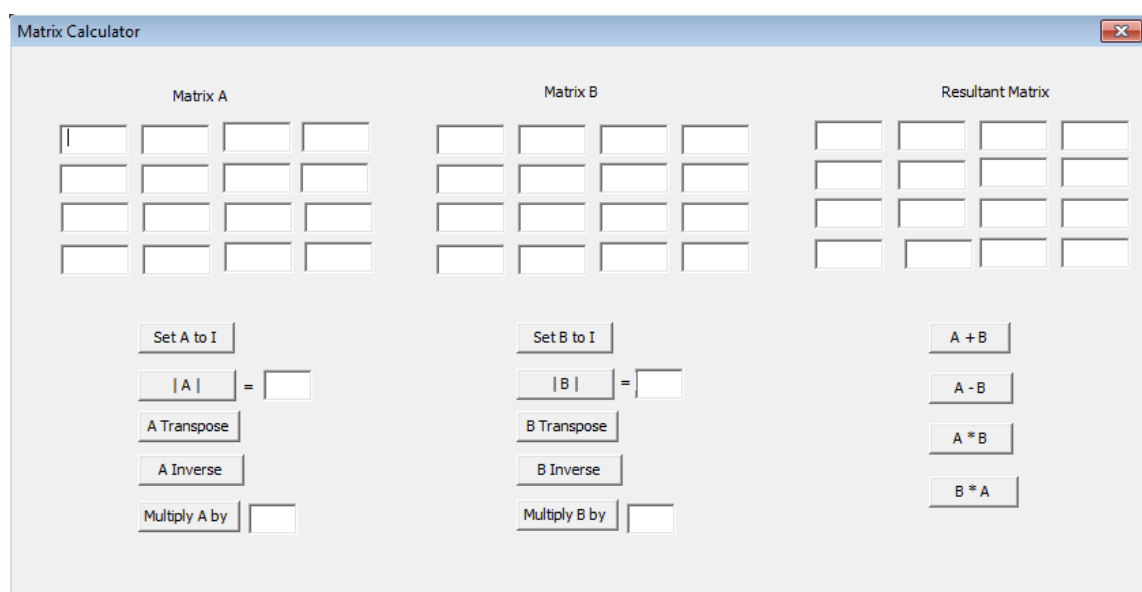


Figure 1 : Matrix Calculator

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Quaternion Calculator

Project name: Quaternion Calculator - Student Name.zip

Write an application that allows the user to input two quaternions (a and b), and then performs various quaternion operations as shown in Figure 2.

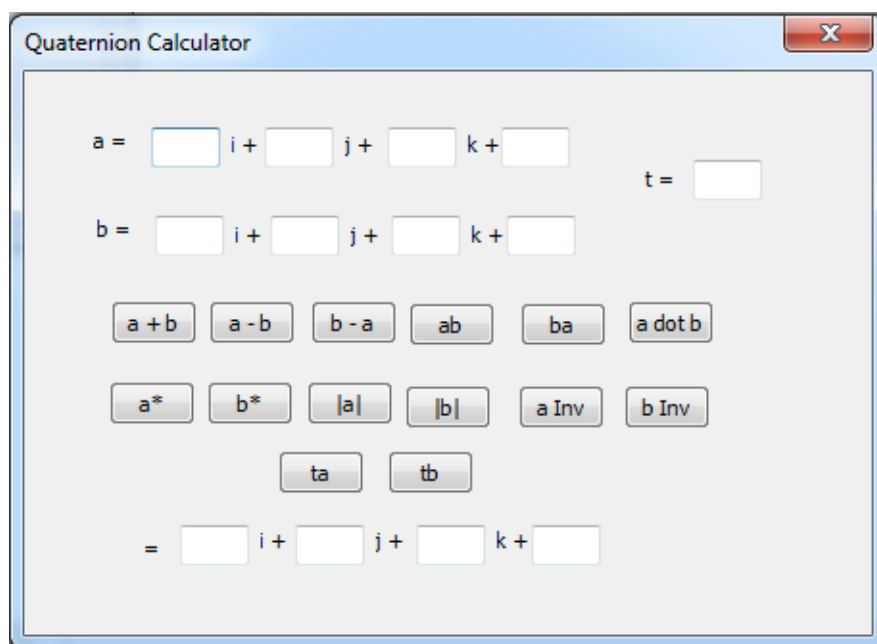


Figure 2 : Quaternion Calculator

Note: t is a scalar number in the above Figure.

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Gaussian Eliminator

Project name: Gaussian Eliminator - Student Name.zip

Write an application that allows the user to implement a Gaussian eliminator as shown in Figure 3. The application must display a dialog box when the row operations on the augmented matrix results in :

1. Row Echelon form
2. Reduced Row Echelon form

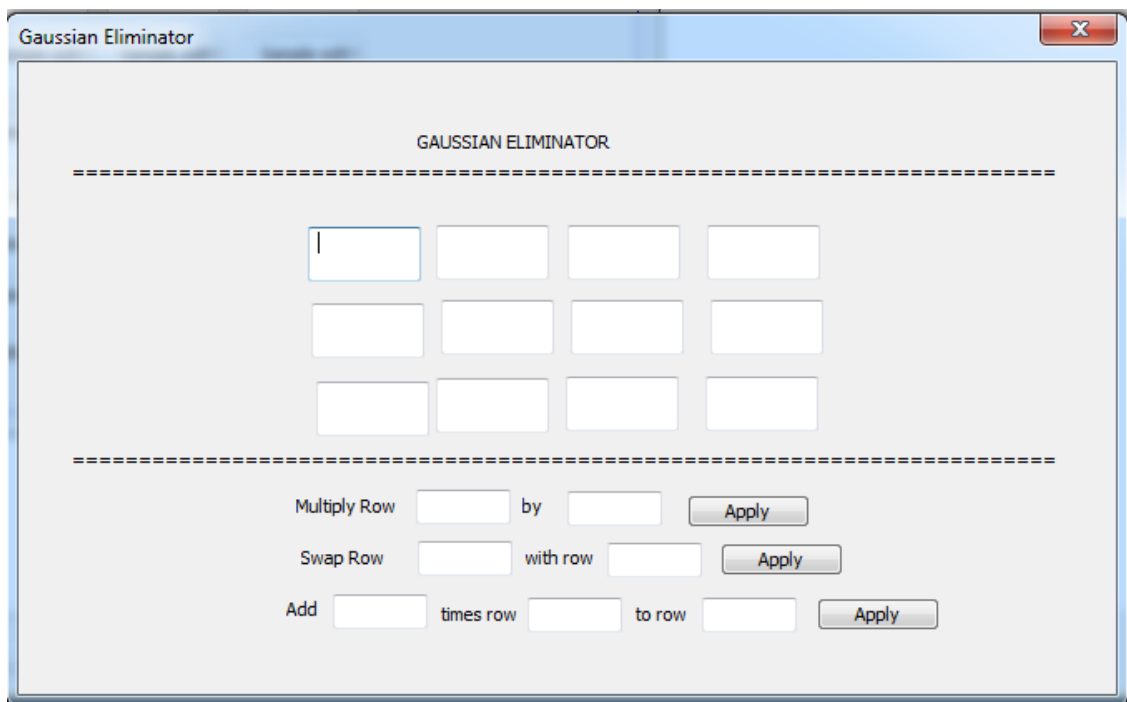


Figure 3 : Gaussian Eliminator

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SLERP Calculator

Project name: Slerp Calculator - Student Name.zip

Write an application that allows the user to input two quaternions (a and b), and then perform a slerp to some user defined parameter 't'.

1. It should also generate the matrix based on quaternion a, b, or slerp(a, b, t) as shown in Figure 4.

Figure 4 : SLERP Calculator

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Transformation Matrices Calculator

Project name: Transformation Matrices - Student Name.zip

Write an application that allows the user to implement a calculator for computing Transformation Matrices as shown in Figure 5.

Figure 5 : Transformation Matrices

The different types of transformations are

1. Scaling and Skewing
2. Translation
3. Rotation
4. Projection

If no transformation type is chosen, the resultant matrices should be Identity Matrices.

The application should also allow the user to choose multiple transformations at one time and build the resultant matrix by concatenating the individual matrices in the order in which the transformations have been chosen.