

FIRST Wxmaxima PROJECT

You each get an individual wxMaxima problem that is a function of your Student Id number. Your student ID has 7 digits. Take the last three digits and call these d, e, f .

For example, if your ID was 0023456 the three digits on the right are 456. Then $d = 4, e = 5, f = 6$.

The first problem will explore associativity for 3×3 matrix multiplication.

In wxMaxima do the following:

(1) Define the matrices $A = \begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix}, B = \begin{pmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{pmatrix},$

$$C = \begin{pmatrix} c_{11} & c_{12} & c_{13} \\ c_{21} & c_{22} & c_{23} \\ c_{31} & c_{32} & c_{33} \end{pmatrix}.$$

(2) Find the matrix products $A(BC)$ and $(AB)C$.

(3) Are the products you get equivalent?

For the second problem, use wxMaxima to solve the following equation for X :

$$\begin{pmatrix} 1 & 21 & 21 & 1 & 34 \\ 2 & 3 & 4 & 5 & 1 \\ 1 & 2 & 5 & 4 & 3 \\ 3 & 2 & 4 & 5 & 6 \\ 3 & 2 & 4 & 2 & 2 \end{pmatrix} X = \begin{pmatrix} d & e & f & 2 & 3 \\ 43 & 54 & 65 & 65 & 76 \\ 23 & 32 & 54 & 45 & 56 \\ 1 & 2 & 1 & 3 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

First, how many rows and columns should X have?

Next, how do we solve a matrix equation of the form $AX = B$?

Save your work as yourlastname.wxm. (For example, if your last name is Smith, your project should be saved as smith.wxm.) Please include comment cells with explanations throughout your project.