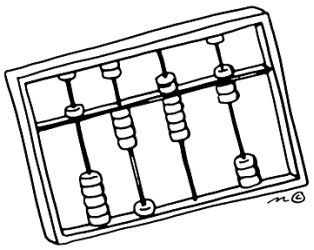
Matrix



- How ready are you for university?
- This assignment is from UWaterloo's CS116 Spring 2011 Assignment 1.
- It is the second CS course taken by CS majors.
- I changed a bit of the assignment, because it was in Scheme and I needed to translate it to java.

Question 1: Matrix Multiplication [20 Marks]

Given two 2×2 matrices

$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}, \quad B = \begin{bmatrix} e & f \\ g & h \end{bmatrix},$$

recall that their product (multiplication) is given by

$$A \times B = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \times \begin{bmatrix} e & f \\ g & h \end{bmatrix} = \begin{bmatrix} ae+bg & af+bh \\ ce+dg & cf+dh \end{bmatrix}.$$

For this question you will implement a Scheme function to multiply a list of 2×2 matrices together. To represent a 2×2 matrix in your function, you will need to use the following structure which is provided in the assignment interface file:

Create a matrix object. Name it 'Mat2x2'

Instance variables:

- int m11
- int m12
- int m21
- int m22

Methods:

- Mat2x2(int m11, int m12, int m21, int m22)
- Mat2x2 Multiply(Mat2x2 m)
- toString //prints m11, m12, m21, m22 in a line

Make a runner class as well that tests it. For example, it might contain:

```
Mat2x2 m = new Mat2x2(4,3,2,0);
Mat2x2 n = new Mat2x2(4,-1,-6,0);
Math2x2 ans = m.multiply(n);
System.out.println(ans);
```