Assignment 5

The goal of this assignment is to familiarize the student with the following on matrices:

- Indexing
- Slicing
- Reassignment
- Functions
- **dot** operation
- Mathmatical operations

The student will also learn to create and submit their first program following ettiquete tought in class. This assignment's ultimate purpose is to reinforce what was assigned in the previous assignment and to improve feasability when interacting with matrices. Essentially, the student will eventually be treating matrices as if they were easy algebra!

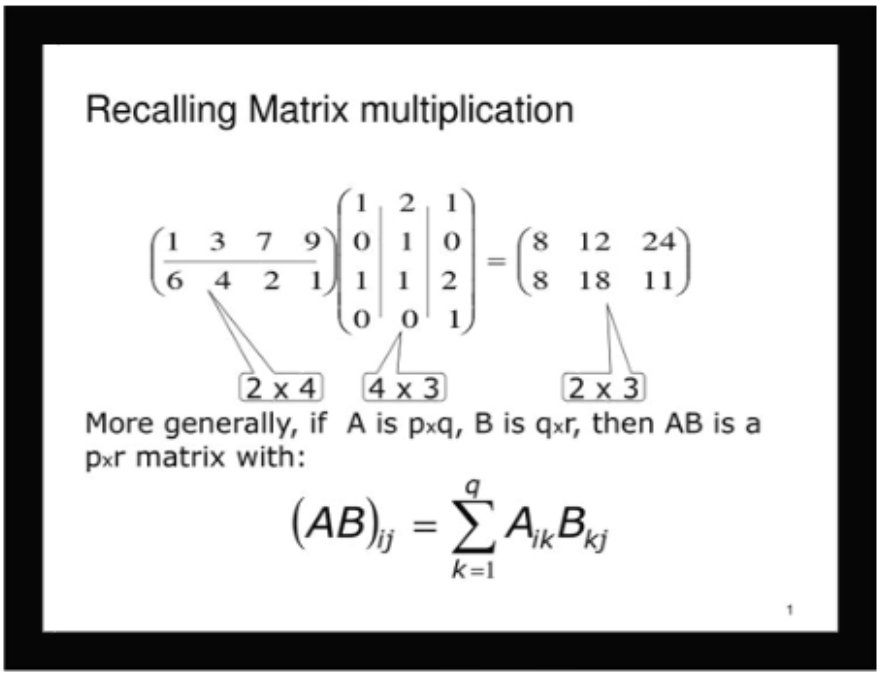
0.1 Research

I would like you to give me a brief summary of what the dot operator does for Matrices. Why would it be useful?

0.2 Problem

0.2.1 Part 1

Create two Matrices A for the left matrix and B for the right (refer to the figure on the slide). Multiply Matrices A and B to attain the result after the equals sign. Now transpose the result. Add that result to C = transpose([1 1 2; 2, 3, 4]) and assign to D. Now take the dot product C and D and assign to E. Assign the first and third component of E to 12 and 16, respectivly. Have the answer display only the first, every other one, and the end components of E.



0.2.2 Part 2

In the same program, I would like you to verify the solution to the vector $\vec{x}$

$$A^{[1]} = \begin{bmatrix} 1 & 0 & 10 \\ 11 & 3 & 1 \\ 12 & 1 & 0 \end{bmatrix}$$

$$\vec{x}^{[1]} = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$$

$$b^{[1]} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

Use the function *linsolve* to solve for the $\vec{x}$. Display your answer. Now, recognize the form:

$$A\vec{x} = b \tag{1}$$

taking the inverse of A on both sides, we are left with:

$$A^{-1}A\vec{x} = A^{-1}b \tag{2}$$

$$= A^{-1}b \tag{3}$$

This leaves us to our solution of $\vec{x}$. Display this solution.

NOTE: You can check your work by hand but I do **not** require work on a seperate sheet of paper.