

MATH 111 – MATLAB ASSIGNMENT 2 – DUE 12 JUNE 2013

Answer all of the following questions. You may work in groups of no more than **three persons** to complete this assignment. One copy of the completed assignment is to be turned in for each group.

You are expected to turn in the following items:

1. A printout of a MATLAB diary file containing the MATLAB commands and output that you used to complete the assignment. You must also include text explaining what you are doing. This can be done in two ways, (a) by typing comments directly on the MATLAB command line (MATLAB ignores everything typed after a % sign, or (b) by editing your diary file afterward in a text editor.
2. Any hand calculations that you are asked to do as part of the assignment. These should be put on a separate sheet of paper.
3. Turn in your assignment as either a `.txt` file or as a `.pdf` file through Blackboard.
4. If you work in a group, please turn in just one assignment for the group and make sure that the names of the entire group appear on the assignment.

This assignment is due before 9:30 am on Wednesday 12 June 2013. No late assignments will be accepted. You may turn in the assignment early if you wish.

1. (6 pts. each) In this problem, we explore MATLAB's capability to do matrix arithmetic.

(a) In MATLAB, define the matrices $A = \begin{bmatrix} 2 & -1 & 4 \\ 3 & -1 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 1 \\ -1 & 3 \\ 0 & 1 \end{bmatrix}$, and $C = \begin{bmatrix} 1 & 2 \\ 3 & 3 \end{bmatrix}$.

- (b) Use MATLAB to calculate AB , AC , CA , and $AB + C$. What happens in the case when the product is undefined?

2. (6 pts. each) An economy consists of 4 industries, labelled *I*, *II*, *III*, and *IV*. The input-output matrix A for these industries is the following

	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
<i>I</i>	.01	.02	.03	0
<i>II</i>	.10	.01	.02	.05
<i>III</i>	.12	.15	.02	.09
<i>IV</i>	.08	.02	0	.12

- (a) Use MATLAB to find the matrix $(I - A)^{-1}$. (Hint: Use MATLAB's `inv` and `eye` commands.)

- (b) Given a final demand of $D = \begin{bmatrix} 200 \\ 250 \\ 300 \\ 200 \end{bmatrix}$, find the level of output of each industry that meets this demand.

At this level of output, how much is used in production? You must use MATLAB commands for all of these calculations.