Lesson Plan
SI Session #3
August 11, 2017

SI Leader: Eason Chang

Course: Math 18
Academic Quarter: Summer Session2 2017
Instructor: Professor Drimbe

Topics Covered:
Linear Dependence and Row Echelon Forms

TEACHING + LEARNING
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Opener Activity:

5:05pm - 5:10pm

- Spend 5 minutes to note storm, then proceed with a vocabulary quiz.

Activity 1

5:10pm - 5:30pm

Refer back to notes.

Definition:

A matrix is in echelon form if it has

1. All nonzero rows are above any rows of all zeros

2. Each leading entry of a row is in a column to the right of the leading entry of the row above it.

3. All entries in a column below a leading entry are zeros

If a matrix in echelon form has the following conditions, then it is in reduced echelon form

4. The leading entry in each nonzero row is 1
5. Each leading 1 is the only nonzero entry in its column

Practice Problem 1a

$$A = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 1 & 2 & 3 \\ 0 & 1 & 2 & 3 \end{bmatrix}$$

Practice Problem 1a Solutions:

$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 1 & 2 & 3 \\ 0 & 1 & 2 & 3 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 \\ 0 & 1 & 2 & 3 \\ 0 & 1 & 2 & 3 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 2 & 3 \\ 0 & 0 & 0 & 0 \\ 0 & 1 & 2 & 3 \end{bmatrix} \rightarrow$$

$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 2 & 3 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 0 & -1 & -2 \\ 0 & 1 & 2 & 3 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

Row 2 = Row 1 – Row 2
Row 2 <-> Row 3
Row 4 = Row 2 – Row 4
Row 1 = Row 1 – Row 2

Activity 2

5:30pm - 5:45pm

Practice Problem 2a: Row reduced echelon form

$$B = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 2 & 2 \\ 1 & 0 & 1 \end{bmatrix}$$

Solution to Practice Problem 2a:

(b)

$$\begin{bmatrix} 1 & 2 & 1 \\ 2 & 2 & 2 \\ 1 & 0 & 1 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 2 & 1 \\ 0 & -2 & 0 \\ 0 & -2 & 0 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 2 & 1 \\ 0 & -2 & 0 \\ 0 & 0 & 0 \end{bmatrix} \rightarrow$$

$$\begin{bmatrix} 1 & 0 & 1 \\ 0 & -2 & 0 \\ 0 & 0 & 0 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

Row2 = Row2 – 2 * Row1
Row3 = Row3 – Row1
Row3 = Row3 – Row2
Row2 = -1/2 * Row2

Practice Problem 2b:

$$\left[\begin{array}{cccc|c} 2 & 1 & -1 & 2 & -6 \\ 3 & 4 & 0 & 1 & 1 \\ 1 & 5 & 2 & 6 & -3 \\ 5 & 2 & -1 & -1 & 3 \end{array}\right]$$

Solution to Practice Problem 2b:

$$\left[\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 4 \\ 0 & 0 & 0 & 1 & -2 \end{array}\right]$$

Closure- Survey/ Feedback

5:45pm- 5:50pm

- Wrap-up:
    - Please share with the group one thing you gained understanding of through the session today.
    - Make a note to yourself/ write down anything you need to review/ do more practice problems on.

- Survey/ Feedback:
    1. How fun was the session? (1-10)
    2. How useful was the session? (1-10)
    3. Would you come back? (yes or no)
    4. Optional: Comments (pace of the activity), questions, concerns, suggestions, feedback on the back or wherever

Please recommend SI to your friends/ peers if you found the session useful! Thanks for coming and have a great day :)

PLANNING THE SI SESSION

SI Leader:
Session Date & Day of Week:
Course:
Course Instructor:

	Content to cover:	**Collaborative Learning Technique**	**Strategy to be used:**
Warm-up/ Opening: **(2-4 min.)**			

Please provide a **DETAILED BREAKDOWN** of warm-up activity **OR** attach corresponding document(s)

	Content to cover:	**Collaborative Learning Technique**	**Strategy to be used:**
Cool-down/ Closing: **(2-4 min.)**			

Please provide a **DETAILED BREAKDOWN** of cool-down activity **OR** attach corresponding document(s)

Workout: **(44-46 min.)**	**Content to cover:**	**Collaborative Learning Technique(s)**	**Strategy(ies) to be used:**

Please provide a **DETAILED BREAKDOWN** of workout activity **OR** attach corresponding document(s)