

DAILY ASSESSMENT FORMAT

Date:	15-07-2020	Name:	BINDUSHRI		
Course:	Mathematics for machine learning:linear algebra (coursera)	USN:	4AL17EC011		
Topic:	Week-4	Semester & Section:	6th sem&Asec		
Github repository	Bindushri				

FORENOON SESSION DETAILS (9.00am to 1.00pm)



Non-square matrix multiplication
Practice Quiz • 20 min



Congratulations! You passed!

TO PASS 75% or higher

Keep Learning

GRADE

87.50%

Non-square matrix multiplication

TOTAL POINTS 8

1. In the previous lecture we saw the Einstein summation convention, in which we sum over any indices which are repeated. In traditional notation we might write, for example, $\sum_{j=1}^3 A_{ij} v_j = A_{i1} v_1 + A_{i2} v_2 + A_{i3} v_3$. With the Einstein summation convention we can avoid the big sigma and write this as $A_{ij} v_j$. We know that we sum over j because it appears twice.

1 / 1 point

We saw that thinking about this type of notation helps us to multiply non-square matrices together. For example, consider the matrices

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 0 & 1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix},$$

and remember that in the A_{ij} notation the first index i represents the row number and the second index j represents the column number. For example, $A_{12} = 2$.

Let's define the matrix $C = AB$. Then in Einstein summation convention notation $C_{mn} = A_{mj} B_{jn}$.

Using the Einstein summation convention, calculate $C_{21} = A_{2j} B_{j1}$.



Example: Using non-square matrices to do a projection
Practice Quiz • 30 min



Congratulations! You passed!

TO PASS 40% or higher

Keep Learning

GRADE

42.86%

Example: Using non-square matrices to do a projection

TOTAL POINTS 7

1. This quiz is a bit more tricky than the others. We've lowered the pass grade accordingly. Do read through the feedback after submission to build your understanding.

1 / 1 point

The quiz builds sequentially, so don't be afraid to submit and check your answers after tricky questions to make sure you're on the right track before moving on to later questions.

Shadows are an example of a transformation that reduces the number of dimensions. For example, 3D objects in the world cast shadows on surfaces that are 2D.

We can consider an example for looking at shadows using linear algebra.



week-4

summation convention and arguments of the elements

$$\begin{matrix} & A & & B & & AB \\ \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & \\ \vdots & & & a_{nn} \end{pmatrix} & \begin{pmatrix} b_{11} & b_{12} & \dots & b_{1n} \\ \vdots & & & \\ b_{n1} & & & b_{nn} \end{pmatrix} & = & \begin{pmatrix} \\ \\ \\ \end{pmatrix} \\ \text{row} \uparrow \text{column} & & & & & \end{matrix}$$

$$(ab)_{23} = a_{21}b_{13} + a_{22}b_{23} + \dots + a_{2n}b_{n3}$$

$$ab_{jk} = \sum_j a_{ij} b_{jk} = a_{ij} b_{jk}$$

$$AB = C$$

$$c_{jk} = a_{ij} b_{jk}$$

$$\begin{matrix} 2 & 3 & & 4 \\ \begin{pmatrix} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \end{pmatrix} & \begin{pmatrix} \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \end{pmatrix} & = & 2 \begin{pmatrix} \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \end{pmatrix} \\ & 3 & & \end{matrix}$$

$$\begin{matrix} u & v \\ \begin{pmatrix} u_1 \\ u_2 \end{pmatrix} \times \begin{pmatrix} v_1 \\ v_2 \end{pmatrix} & [u_1, u_2, \dots, u_n] \begin{bmatrix} v_1 \\ v_2 \\ \vdots \\ v_n \end{bmatrix} \\ u^i v_i & G = \begin{bmatrix} u_1 \\ u_2 \end{bmatrix} \end{matrix}$$

Non-Square Matrix Multiplication

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 0 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$$

$$C = \begin{bmatrix} 1+0+3, & 1+2+0, & 0+2+3 \\ 4+0+1, & 4+0+0, & 0+0+1 \end{bmatrix}$$

$$\begin{bmatrix} 4, & 3, & 5 \\ 5, & 4, & 1 \end{bmatrix} //$$

$$① [2 \ 4 \ 5 \ 6] \begin{bmatrix} 1 \\ 3 \\ 2 \\ 1 \end{bmatrix}$$

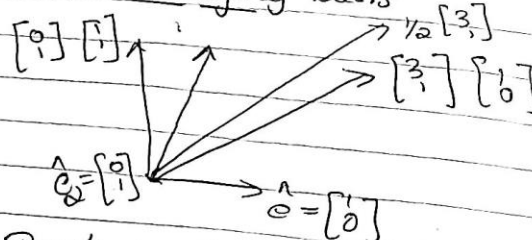
$$2 + 12 + 10 + 6 \rightarrow \underline{30}$$

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \end{bmatrix}$$

$$② \begin{bmatrix} 2 & -1 \\ 0 & 3 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} 0 & 1 & 4 \\ -2 & 6 & 0 \\ -1 & 2 & 2 \end{bmatrix}$$

$$2 \cdot 2 = 4, 2 \cdot 6 = 12, 2 \cdot 2 = 4$$

Matrices changing basis



Bear's basis vectors $\begin{bmatrix} 3 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ 1 \end{bmatrix}$ in my frame

$$\begin{bmatrix} 3 & 1 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} 3/2 \\ 1/2 \end{bmatrix} = \begin{bmatrix} 5 \\ 2 \end{bmatrix}$$

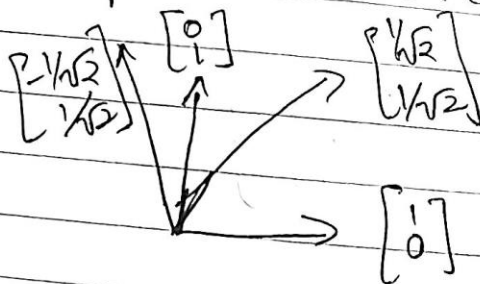
Bear's basis in my coord \downarrow Bear's coord \downarrow my vector

B

B^{-1}

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

Transformation in a changed basis

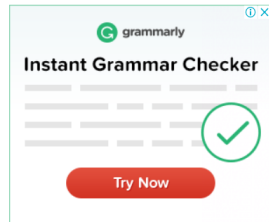


Orthogonal Matrices

$$A_{ij}^0 = A_{ji}$$

AFTERNOON SESSION DETAILS(2.00pm to 5.00pm)

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Small Talk: Conversation Starters

This page covers the language of [small talk](#) when starting a conversation in English.

Talking about the weather

- Beautiful day, isn't it?
- Can you believe all of this rain we've been having?
- It looks like it's going to snow.
- It sure would be nice to be in Hawaii right about now.
- I hear they're calling for thunderstorms all weekend.
- We couldn't ask for a nicer day, could we?
- How about this weather?
- Did you order this sunshine?

Talking about current events

- Did you catch the news today?
- Did you hear about that fire on Fourth St?
- What do you think about this transit strike?
- I read in the paper today that the Sears Mall is closing.
- I heard on the radio today that they are finally going to start building the new bridge.

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Bin

Speak English Professionally: In Person, Online & On the Go > Week 1 > Small Talk & Conversational Vocabulary

Intro to Course

- ✓ **Video:** Introduction to Course
1 min
- ✓ **Discussion Prompt:**
Introduce Yourself to Your Course Mates
5 min
- ✓ **Reading:** Consent Form
10 min

Small Talk & Conversational Vocabulary

Express Yourself:
Pronunciation

"Elevator Speech"

Small Talk & Conversational Vocabulary



Save Note

Discuss

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English

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Notes



Click the "Save Note" button to capture a screenshot highlight and save lines below. Add your own notes you've captured.

Intro to Course

Small Talk & Conversational Vocabulary

✓ **Video:** Small Talk & Conversational Vocabulary
4 min

✓ **Reading:** Review and Practice Small Talk
10 min

✓ **Practice Quiz:** Check Your Knowledge
1 question

Express Yourself: Pronunciation

"Elevator Speech"

PRACTICE QUIZ • 30 MIN

Check Your Knowledge

✓ **Submit your assignment**

[Try again](#)

✓ **Receive grade**
TO PASS 80% or higher

Grade
100%

[View Feedback](#)

We keep your highest score



Speak English professionally

Intro.

1. Face-to-Face communication
2. Meet and talk online
3. powerful phone talk.

Small-talk

→ everyday conversation

→

- * Introduce yourself
- * Make a connection
- * Ask question
- * Be a good listener
- * Show your interest