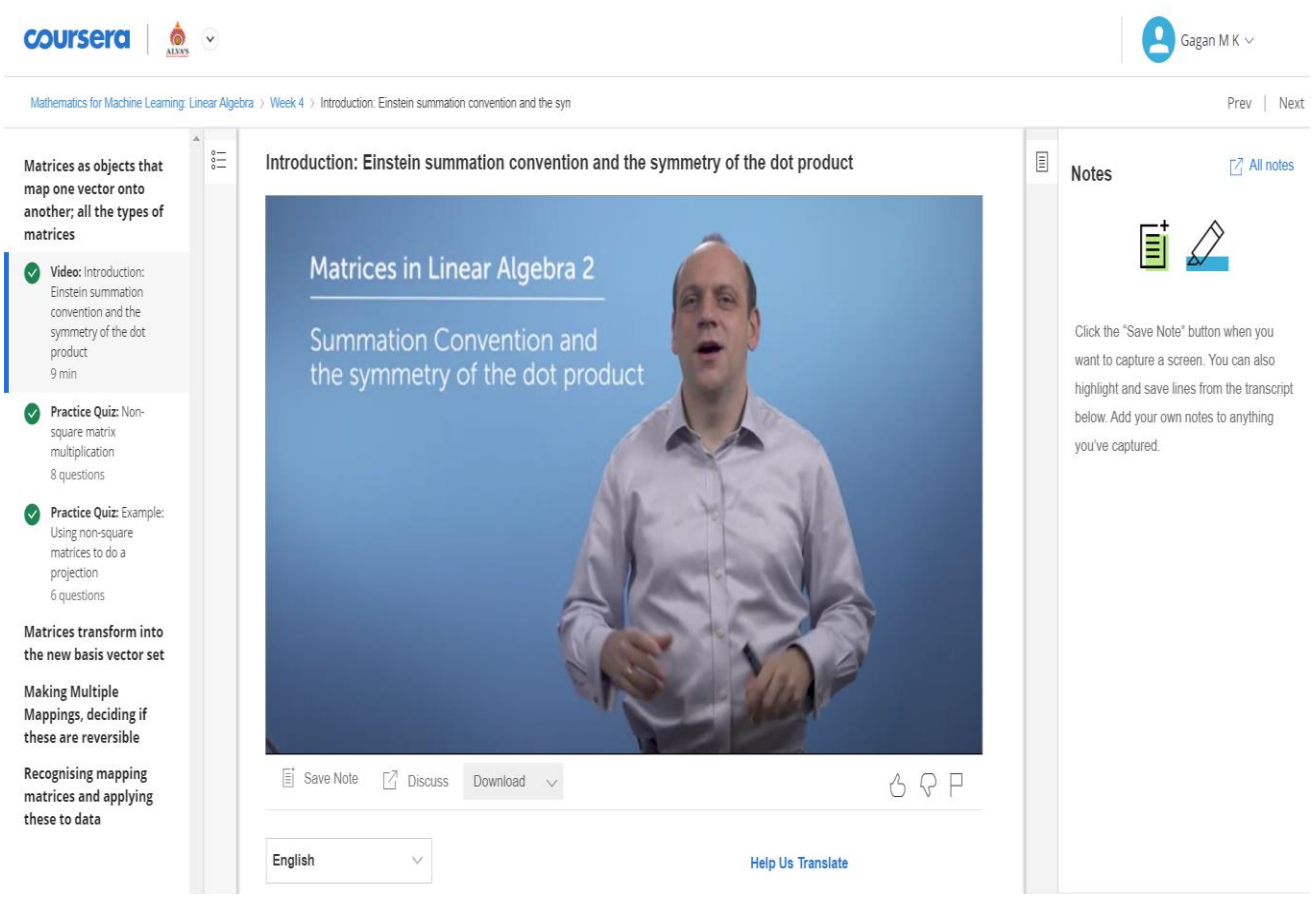
DAILY ASSESSMENT REPORT

Date:	16 July 2020	Name:	Gagan M K
Course:	Mathematics for Machine Learning: Linear Algebra	USN:	4AL17EC032
Topic:	• Week 4	Semester & Section:	6th sem & 'A' sec
GitHub Repository:	Alvas-education-foundation/Gagan-Git		

FORENOON SESSION DETAILS

Image of session



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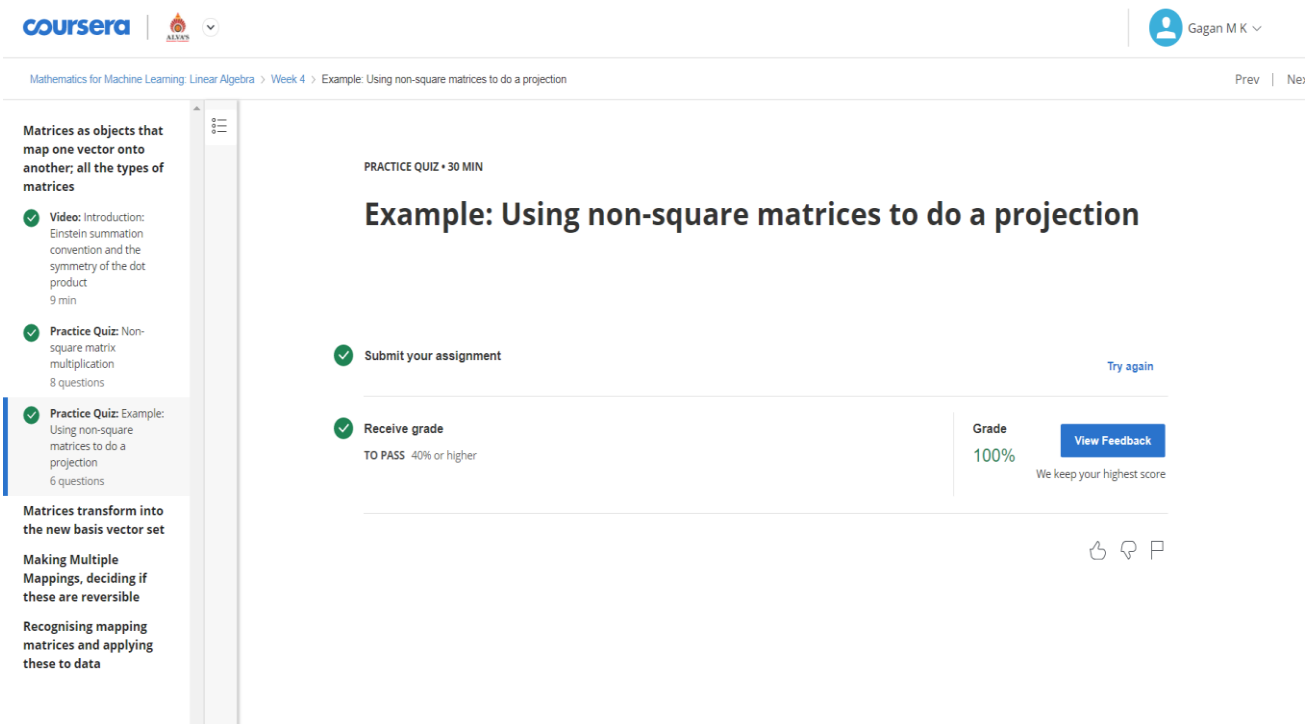
Einstein summation convention and the symmetry of the dot product:

- Now, there's an important other way to write matrix transformations down. It's called the Einstein's Summation Convention. And that writes down what the actual operations are on the elements of a matrix, which is useful when you're coding or programming.
- It also lets us see something neat about the dot product that I want to show you. And it lets us deal with non-square matrices. When we started, we said that multiplying a matrix by a vector or with another matrix is a process of taking every element in each row in turn, multiplied with corresponding element in each column in the other matrix, and adding them all up and putting them in place.
- So, let's write that down just to make that concrete. So I'm going to write down a matrix A here, and I'm going to give it elements. A's an n by n matrix. I'm going to give it elements a11, a21, all the way down to an1. And then a12, all the way across to a1n. And then I'll have a22 here all the way across, all the way down until I fill it all in and I've got ann down here.
- So the first suffix on this matrix, first suffix on all of these elements in the matrix is the row number, and the second one is the column number. Now, if I want to multiply A by another matrix B, and that's also going to be an n by n matrix, and that will have elements b11, b12 across to b1n, and down to bn1 and across to bnn, dot, dot, dot, dot, dot, dot, dot, dot, dot.
- If I multiply these together, I'm going to get another matrix, which I'll call AB, and then what I'm going to do is I'm going to take a row of A multiplied by the elements of a column of B and put those in the corresponding place. So let's do an example.
- So if I want an element, let's say ab, element two, three. I'm going to get that by taking row two of A, multiply by column three of B. So I'm going to take row two of A, that's going to be a21, a22, and all the others up to a2n, and I'm going to multiply it by column three of B.
- So that's b13, b23, all the way to bn3. And I'm going to add all those up. And I'll have a dot, dot, dot in between. So that's going to be this element, row two, column three of AB. Now, in Einstein's convention, what you do, is you say, well okay, this is the sum over some elements j of aij, bjk.
- So if I add these up over all the possible j's, I'm going to get a11, b11 plus a12, b21, and so on, and so on, and that's for i and k as well. I'm going to then go around all the possible i's and k's. So, what Einstein then says, well okay, if I've got a repeated index, I won't bother with the sum and I'll just write that down as being aij, bjk.
- And that's equal to this the product abik. So abik is equal to ai1, b1k, plus ai2, b2k, plus ai3, b3k and so on and so on, until you've done all the possible j's, and then you do that for all the possible i's and k's, and that will give you your whole matrix for AB, for the product.
- Now, this is quite nice. If you are coding, you just run three loops over i, j and k, and then use an accumulator on the j's here to find the elements of the product matrix AB. So the summation convention gives you a quick way of coding up these sorts of operations.
- Now, we haven't talked about this so far but now we can see it. There's no reason, so long as the matrices have the same number of entries in j, then we can multiply them together even if they're not the same shape.

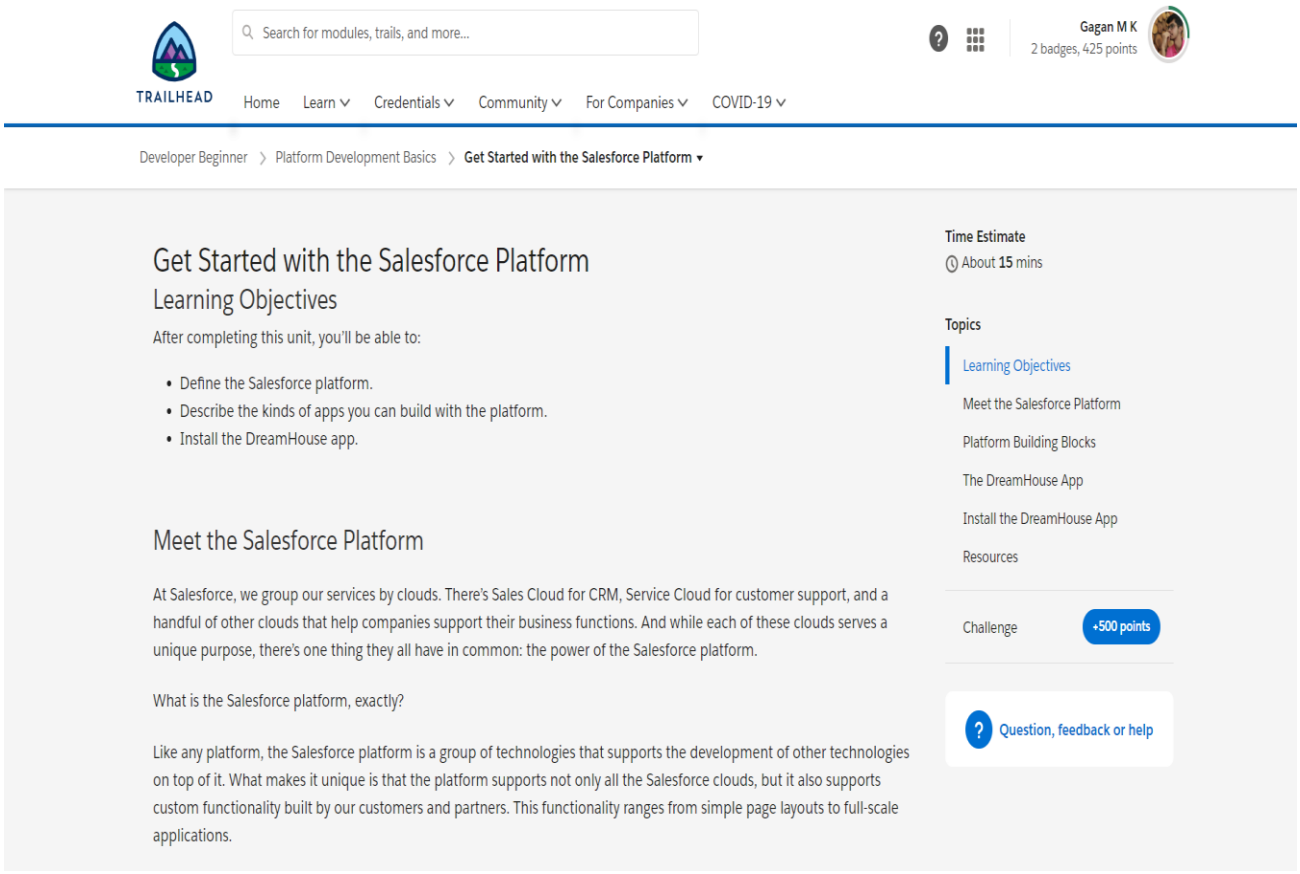
- So we can multiply a two by three matrix, something with two rows and three columns. So one, two, three, one, two, three, by a three by four matrix, three there and four there. So it's got one, two, three, four times.
- And when I multiply these together, I'm going to go that row times that column. I've got the same number of j's in each case, so and then I'm going to be able to do that for all of the possible columns, so I'm going to get something with four columns. And I'm going to be able to do that for the two rows here.
- I'm going to be able to do that row times that one, is going to get a two by four matrix out. So it's going to have one, two, three, four, one, two, three, four. So I can multiply together these non-square matrices if I want to, and I'll get, in the general case, some other non-square matrix.
- I'm going to have the number of rows of the one on the left and the number of columns of the one on the right. Now, all sorts of matrix properties that you might want, inverses and so on, determinants, all start to get messy and mucky, and you somehow can't even compute them when you're doing this sort of thing.
- But there are times when you want to do it. And the Einstein summation convention makes it very easy to see how you do it, and how it's going to work. As long as you got the same number of j's, you're good, you can multiply them together.
- So this show geometrically why that's true. And if we repeat this with the other axes, with e2 here or any other axes there are, then we'll also get the same results. So this is why the projection is symmetric and the dot product is symmetric and why projection is the dot product.



Date:	16 July 2020	Name:	Gagan M K
Course:	Trailhead	USN:	4AL17EC032
Topic:	• Get Started with the Salesforce Platform	Semester & Section:	6th sem & 'A' sec

AFTERNOON SESSION DETAILS

Image of session:



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- **At Salesforce, we group our services by clouds. There's Sales Cloud for CRM, Service Cloud for customer support, and a handful of other clouds that help companies support their business functions. And while each of these clouds serves a unique purpose, there's one thing they all have in common: the power of the Salesforce platform.**
- **What is the Salesforce platform, exactly? Like any platform, the Salesforce platform is a group of technologies that supports the development of other technologies on top of it. What makes it unique is that the platform supports not only all the Salesforce clouds, but it also supports custom functionality built by our customers and partners. This functionality ranges from simple page layouts to full-scale applications.**
- **If you're here today, we're assuming you know a bit about software development. Throughout this module, we're going to give you an overview of development on the Salesforce platform. We talk about some of the pillars of Salesforce development and how they work together to create a robust system. We even touch on some common questions that developers new to the platform run into as they get started.**
- **Before we continue, let's make sure we're on the same page. If you're brand new to Salesforce and you haven't completed the Salesforce Platform Basics module, we suggest you do that before you keep reading.**
- **As we mentioned, the platform not only forms the foundation of core Salesforce products like Sales Cloud and Service Cloud, but it also lets you build your own functionality. Building your own functionality can mean customizing existing Salesforce offerings or it can mean building something from scratch.**
- **Let's focus on that latter part and talk about what the Salesforce platform offers developers.**
- **Our core platform lets you develop custom data models and applications for desktop and mobile. And with the platform behind your development, you can build robust systems at a rapid pace.**
- **And then there's the Heroku platform. Heroku gives developers the power to build highly scalable web apps and back-end services using Python, Ruby, Go, and more. It also provides database tools to sync seamlessly with data from Salesforce.**
- **And then there's the host of Salesforce APIs. These let developers integrate and connect all their enterprise data, networks, and identity information.**
- **And then there's the Mobile SDK. The Mobile SDK is a suite of technologies that lets you build native, HTML5, and hybrid apps that have the same reliability and security as the Salesforce app.**
- **The problem with the platform and all its parts is that listing them out takes a really long time. And just talking about them doesn't help you understand everything they do. Let's take a different approach and talk about what we can do with the platform. Or, more precisely, what we can build with it.**