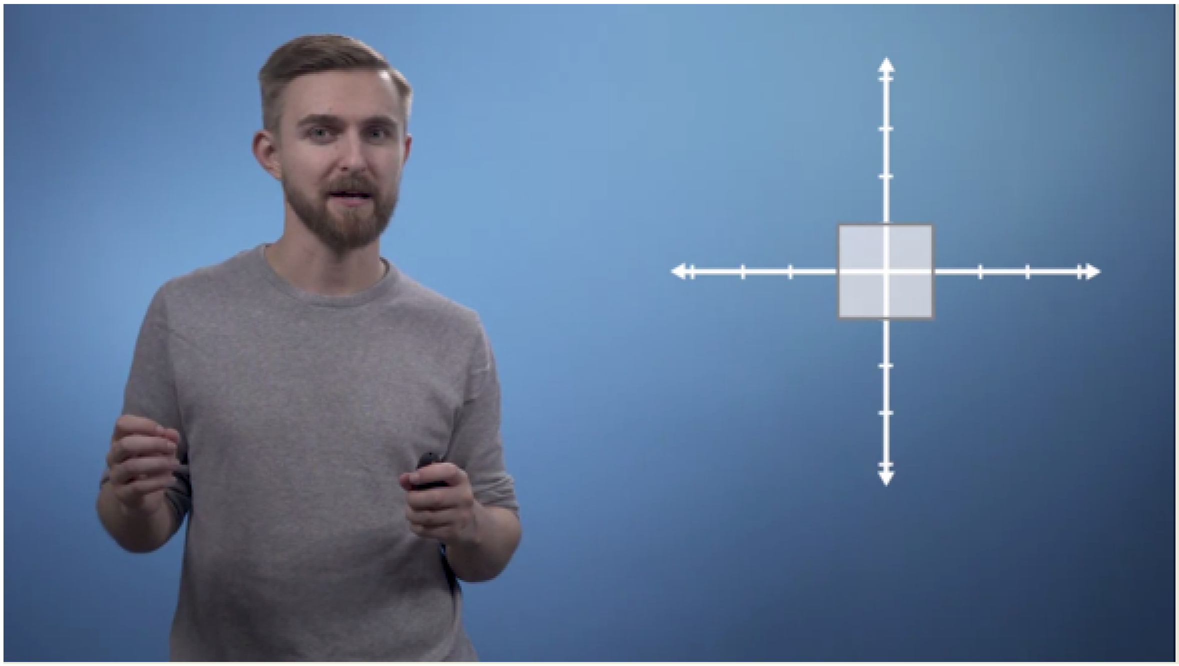
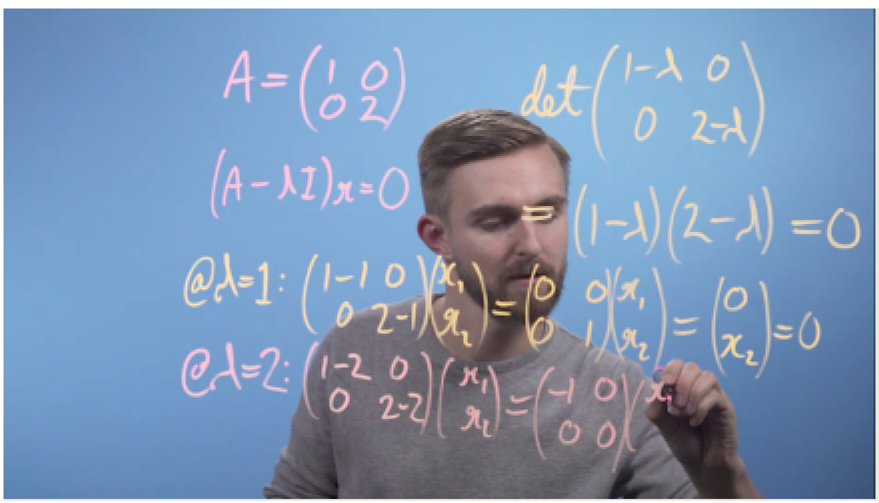
DAILY ASSESSMENT FORMAT

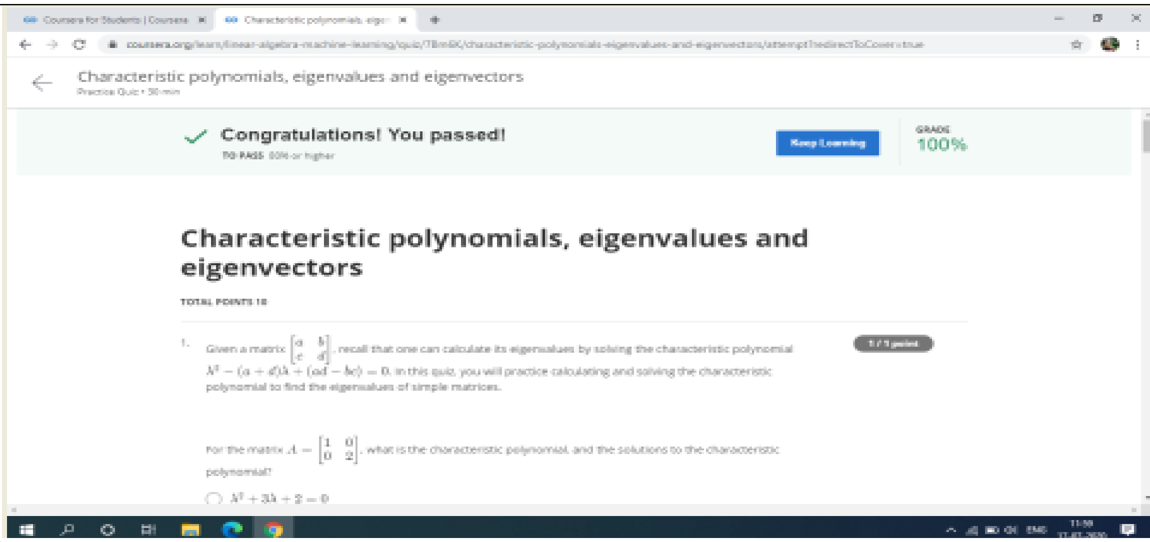
Date:	17th July 2020	Name:	Rajeshwari Gadagi
Course:	coursera	USN:	4AL17EC076
Topic:	Mathematics for machine learning:Linear Algebra	Semester & Section:	6th sem 'B' sec
Github Repository:	Rajeshwari-gadagi		

FORENOON SESSION DETAILS

Image of session







Characteristic polynomials, eigenvalues and eigenvectors
Practice Quiz • 30 min

Congratulations! You passed!
TO PASS 80% or higher

Keep Learning

GRADE
100%

Characteristic polynomials, eigenvalues and eigenvectors

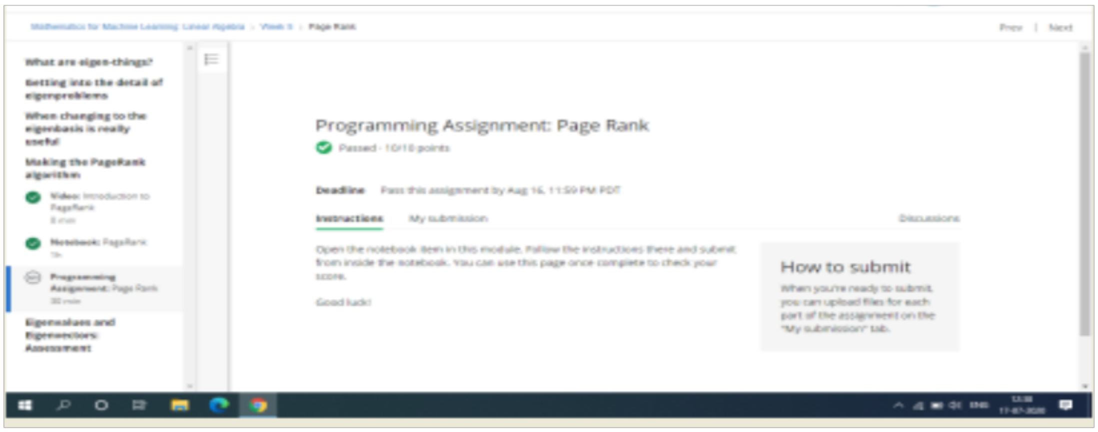
TOTAL POINTS 10

1. Given a matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$, recall that one can calculate its eigenvalues by solving the characteristic polynomial $\lambda^2 - (a+d)\lambda + (ad - bc) = 0$. In this quiz, you will practice calculating and solving the characteristic polynomial to find the eigenvalues of simple matrices.

1 / 1 point

For the matrix $A = \begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix}$, what is the characteristic polynomial, and the solutions to the characteristic polynomial?

◯ $\lambda^2 + 3\lambda + 2 = 0$



Mathematics for Machine Learning: Linear Algebra > Week 3 > Page Rank

Prev | Next

What are eigen-things?
Getting into the detail of eigenproblems
When changing to the eigenbasis is really useful
Making the PageRank algorithm
Video: Introduction to PageRank
Notebook: PageRank
Programming Assignment: Page Rank
Eigenvalues and Eigenvectors: Assessment

Programming Assignment: Page Rank

Passed · 10/10 points

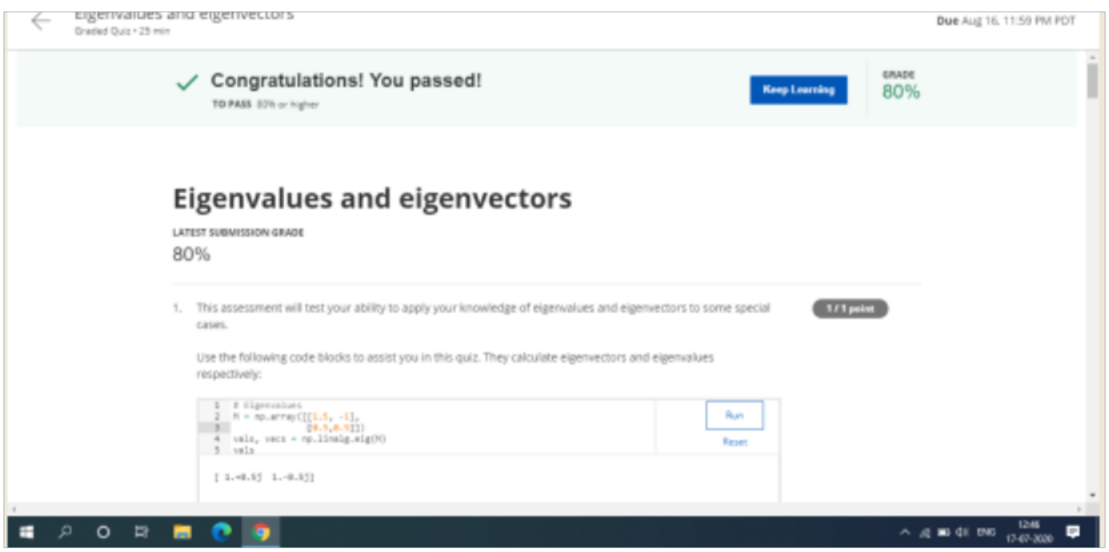
Deadline Pass this assignment by Aug 16, 11:59 PM PDT

Instructions My submission Discussions

Open the notebook item in this module. Follow the instructions there and submit from inside the notebook. You can use this page once complete to check your score.

Good luck!

How to submit
When you're ready to submit, you can upload files for each part of the assignment on the "My submission" tab.



Eigenvalues and eigenvectors
Graded Quiz • 25 min

Due Aug 16, 11:59 PM PDT

Congratulations! You passed!
TO PASS 80% or higher

Keep Learning

GRADE
80%

Eigenvalues and eigenvectors

LATEST SUBMISSION GRADE
80%

1. This assessment will test your ability to apply your knowledge of eigenvalues and eigenvectors to some special cases.

1 / 1 point

Use the following code blocks to assist you in this quiz. They calculate eigenvectors and eigenvalues respectively:

```
# Eigenvalues
M = np.array([[1.5, -1],
              [0.5,0.5]])
vals, vecs = np.linalg.eig(M)
vals
```

Run
Reset

```
[ 1.+0.5j  1.-0.5j]
```

Eigenvalues & eigenvectors :-

Horizontal of three vectors will not be pointing in the same direction after a vertical scaling

→ There are 1 eigenvectors does the transformation have

→ We can posibly draw 1 vectors which are not eigenvectors

Calculating eigen vectors :-

$$Ax = \lambda x$$

$$\underbrace{(A - \lambda I)}_{=0} x = 0$$

$$\det(A - \lambda I) = 0 \qquad A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$$

$$\det\left(\begin{pmatrix} a & b \\ c & d \end{pmatrix} - \begin{pmatrix} \lambda & 0 \\ 0 & \lambda \end{pmatrix}\right) = 0$$

$$\det\left(\begin{pmatrix} a & b \\ c & d \end{pmatrix} - \begin{pmatrix} \lambda & 0 \\ 0 & \lambda \end{pmatrix}\right) = 0$$

$$\lambda^2 - (a+d)\lambda + ad - bc = 0.$$

$$A = \begin{pmatrix} 1 & 0 \\ 0 & 2 \end{pmatrix} \qquad \det\begin{pmatrix} 1-\lambda & 0 \\ 0 & 2-\lambda \end{pmatrix}$$

$$(A - \lambda I)x = 0. \qquad = (1-\lambda)(2-\lambda) = 0$$

$$@\ \lambda = 1 : \begin{pmatrix} 1-1 & 0 \\ 0 & 2-1 \end{pmatrix}\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix}\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} 0 \\ x_2 \end{pmatrix} = 0.$$

$$@\ \lambda = 2 : \begin{pmatrix} 1-2 & 0 \\ 0 & 2-2 \end{pmatrix}\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} -1 & 0 \\ 0 & 0 \end{pmatrix}\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} -x_1 \\ 0 \end{pmatrix} = 0$$

$$@\ \lambda = 1 : x = \begin{pmatrix} t \\ 0 \end{pmatrix}$$

$$A = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$$

$$\det\begin{pmatrix} 0-\lambda & -1 \\ 1 & 0-\lambda \end{pmatrix} = \lambda^2 + 1 = 0.$$