Class missed 1st

Saturday, October 1, 2022 8:43 PM

Matrices in real life

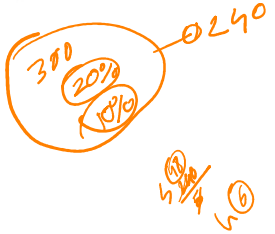
→ 300 people live in a small village

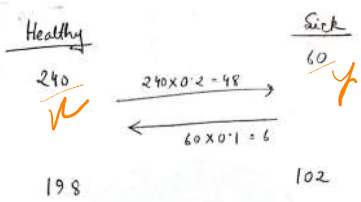
→ one day corona attacks

→ everyday 20% healthy people gets affected

→ everyday 10% of the sick becomes healthy

→ after first day we have 240 healthy people.





Healthy people

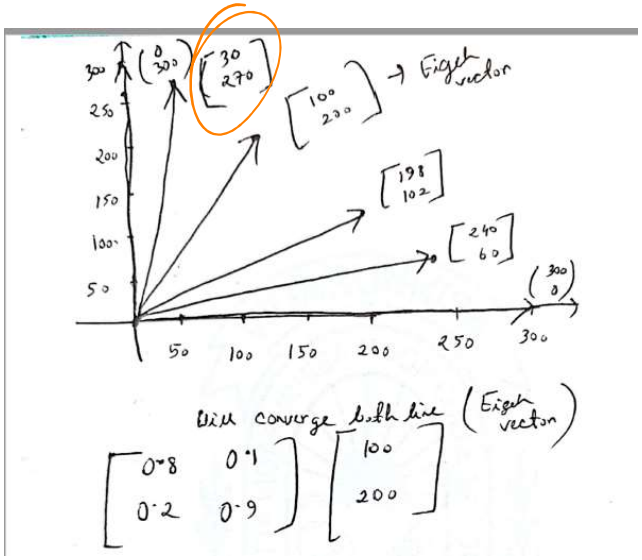
$240 \times 0.8 + 60 \times 0.1 = 198$

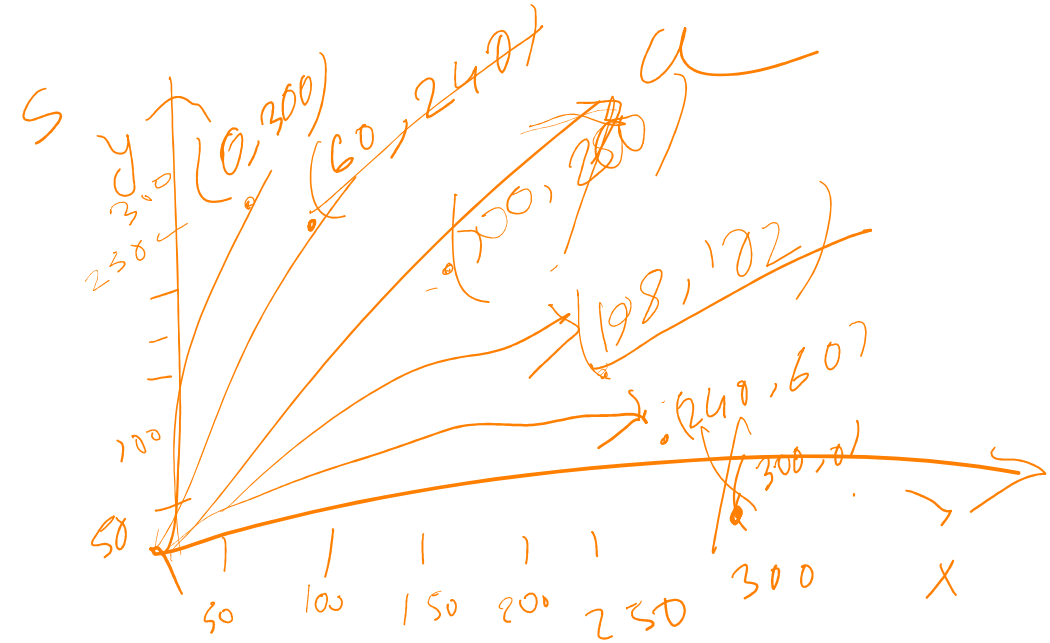
Sick $240 \times 0.2 + 60 \times 0.9 = 102$

$$\begin{bmatrix} 0.8 & 0.1 \\ 0.2 & 0.9 \end{bmatrix} \begin{bmatrix} 240 \\ 60 \end{bmatrix} = \begin{bmatrix} 198 \\ 102 \end{bmatrix}$$

$$\begin{bmatrix} 0.8 & 0.1 \\ 0.2 & 0.9 \end{bmatrix} \begin{bmatrix} \text{current healthy} \\ \text{current sick} \end{bmatrix} = \begin{bmatrix} \text{new healthy} \\ \text{new sick} \end{bmatrix}$$

RAG DAY





Linear Combination

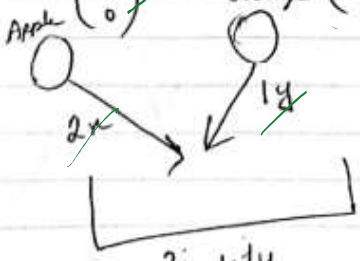
→ linear combinations has two parts

→ scaling each thing by a scalar

→ adding the scaled things together

Apple $\begin{pmatrix}1\\0\end{pmatrix}$ apple orange

Orange $\begin{pmatrix}0\\1\end{pmatrix}$ app orange



$= 2\times\begin{pmatrix}1\\0\end{pmatrix} + 1\times\begin{pmatrix}0\\1\end{pmatrix}$

$= \begin{pmatrix}2\\0\end{pmatrix} + \begin{pmatrix}0\\1\end{pmatrix} = \begin{pmatrix}2\\1\end{pmatrix}$

Subject : Date :

3D

Apple $\begin{pmatrix}1\\0\\0\end{pmatrix}$ Orange $\begin{pmatrix}0\\1\\0\end{pmatrix}$ Mango $\begin{pmatrix}0\\0\\1\end{pmatrix}$

can we make $\begin{pmatrix}10\\15\cdot5\\-248\end{pmatrix}$

$10\begin{pmatrix}1\\0\\0\end{pmatrix} + 15\cdot5\begin{pmatrix}0\\1\\0\end{pmatrix} + (-248)\begin{pmatrix}0\\0\\1\end{pmatrix}$

Subject : Date :

$\begin{pmatrix}1\\0\\5\end{pmatrix}$ $\begin{pmatrix}2\\1\\-2\end{pmatrix}$ $\begin{pmatrix}2\\1/4\\-12\end{pmatrix}$

Will learn that in lecture 4

$10 \begin{pmatrix} 0 \\ 0 \end{pmatrix} + \cdots$

$= \begin{pmatrix} 10 \\ 0 \\ 0 \end{pmatrix} + 15.5 \begin{pmatrix} 0 \\ 15.5 \\ 0 \end{pmatrix} + \begin{pmatrix} 0 \\ 0 \\ -248 \end{pmatrix}$

$= \begin{pmatrix} 10 \\ 15.5 \\ -248 \end{pmatrix}$

$\begin{pmatrix} 0 \\ 5 \end{pmatrix} \quad \begin{pmatrix} -2 \end{pmatrix} \quad \begin{pmatrix} -12 \end{pmatrix}$ in lecture 4

i can we make $\begin{pmatrix} 10 \\ 15.5 \\ -248 \end{pmatrix}$

$\frac{-512}{19} \begin{pmatrix} 1 \\ 0 \\ 5 \end{pmatrix} + \frac{261}{19} \begin{pmatrix} 2 \\ 1 \\ -2 \end{pmatrix} + \frac{115}{19} \begin{pmatrix} 2 \\ 1/4 \\ -12 \end{pmatrix}$

$= 2 \begin{pmatrix} 1 \\ 2 \\ 1 \end{pmatrix} + \begin{pmatrix} 2 \\ 0 \\ -1 \end{pmatrix} = \begin{pmatrix} 4 \\ 4 \\ 1 \end{pmatrix}$

Q

Linearly dependent or not?