TUTORIAL 6 SOLUTIONS

$$A - 7T = \begin{bmatrix} 0.4 & 1-c7 & 57 & 0\\ 0.6 & c \end{bmatrix} = \begin{bmatrix} 0.4-7 & 1-c\\ 0.6 & c-7 \end{bmatrix}$$

$$\det(A-7I) = (.4-1)7 - .6(1-c) = 0$$

$$7^{2} - (.4+c)7 + (c-.6) = 0$$

$$7 = (.4+c)^{\frac{1}{2}} + (4+c)^{\frac{1}{2}} + (6-.6)$$

$$\frac{1}{2} = (.4+c)^{\frac{1}{2}} + (6-.6)$$

$$= (-4+c)^{\pm} \sqrt{c^2} \cdot 3.2c + 256$$

$$= (0.4+C) \pm (C-166)$$

EIGENVECTORS ASSOCIATED WITH 2, ARE ALL VECTORS PARAMELTO

$$\frac{3}{12} = 1$$

$$\begin{bmatrix}
64 & 1-C \\
6 & C
\end{bmatrix}$$

$$\frac{4}{1} = 2i \qquad 2i \neq 0$$

$$\frac{4}{1} \neq 0$$

$$\frac{4}{1} + (1-c)y = x \Rightarrow 66x = (1-c)y$$

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EIGENVECTORS ASSOCIATED WITH BOTH

EIGENVALTIES ARE ALL VECTORS PARALLEL

-4-X, FISH (9) X2: BREND (9) X3: VEG. (9)  $.8x_1 + .25x_2 + .3x_3 = 2.95$   $0x_1 + .7x_2 + .6x_3 = 3.3$   $.2x_1 + .05x_2 + .6x_3 = .75$  $M = \begin{bmatrix} .8 & .25 & .3 & | 2.95 \\ 0 & .7 & .6 & | 3.3 \\ | .2 & .05 & .1 & | .75 \end{bmatrix}$  $M' = \begin{bmatrix} 1 & 0 & 0 & 1 & 2 \\ 0 & 1 & 0 & 1 & 3 \end{bmatrix} \begin{pmatrix} RNF \end{pmatrix}$ 29 FISH 39 BREAD 29 VEG: OU SULUTION 15

A X = Ba)  $\begin{bmatrix} 1 & 1 & -1 & 0 & 0 \\ 2 & 0 & 1 & -1 & 0 \\ 0 & 2 & -3 & 1 & 0 \\ 0 & 2 & -3 & 1 & 0 \end{bmatrix} = \begin{bmatrix} 5 \\ 2 \\ 8 \end{bmatrix}$  $M = \{A \mid B\}$  $M = \begin{bmatrix} 1 & 0 & .5 & -.5 \\ 0 & 1 & -1.5 & .5 & 4 \\ 0 & 0 & 0 & 0 \end{bmatrix} \begin{pmatrix} RNF \end{pmatrix}$ LEADING VARIABLES: X, X2 FREE VARIABLES: X3,X4  $= 1 - .5x_3 + .5x_4$  $X_2 = 4 + 1.5X_3 - .5X_4$ (b)  $X_1 = 1 + 2(-5) + 2(-5) = 1$ ;  $X_2 = 4 + 2(15) + 2(-5) = 6$  $X_3 = X_4 = 2$ 

$$M = \begin{bmatrix} 1 & 0 & -\frac{5}{4} & \frac{1}{4} \\ 0 & 1 & \frac{9}{14} & \frac{35}{14} \end{bmatrix} \begin{pmatrix} RNF \end{pmatrix}$$

$$X = \frac{1}{4} + \frac{5}{4} = \frac{35}{4} - \frac{9}{4} = \frac{2}{4}$$

$$\begin{array}{c} \overset{\circ}{06} \\ \boxed{y} = \begin{array}{c} 5/4 \\ 35/4 \end{array} + \begin{array}{c} 5/4 \\ \boxed{z} \end{array}$$

Z 15 A FREE VARIABLE.

$$Z=1 \Rightarrow X=6/4 \quad V=26/4$$
  
 $Z=2 \Rightarrow X=1/4 \quad Y=1/4$ 

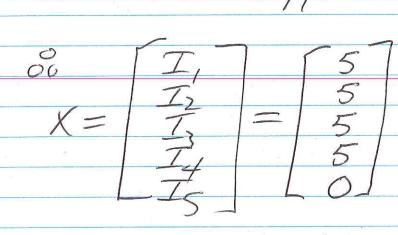
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X4, X6 FREE

c) 
$$x_4 = 50$$
  $x_5 = 0$ 



NOTE : NO FIRE VARIABLES; EVERY VARIABLE 15 A LEADING VARIABLE.

C) A ROW OF ZERUS APPEARS IN M'
BECAUSE OF SOME REDUNDANCY IN THE
MODEL EQUATIONS. SINCE THE CAST

EQUATION IN M' IS SATISFIED FOR ALL

I's, THIS CAST ROW DOES NOT

CHANGE THE SCUTION.