Edwin ([illegible]) Sparks

Data Structures: Homework Ch. 6

1)

$$\begin{aligned} 2x + y - z &= 8 \\ -3x - y + 2z &= -11 \\ -2x + y + 2z &= -3 \end{aligned} \Rightarrow \left[\begin{array}{ccc|c} 2 & 1 & -1 & 8 \\ -3 & -1 & 2 & -11 \\ -2 & 1 & 2 & -3 \end{array}\right]$$

$$\xrightarrow{R_3 = R_1 + R_3} \left[\begin{array}{ccc|c} 2 & 1 & -1 & 8 \\ -3 & -1 & 2 & -11 \\ 0 & 2 & 1 & 5 \end{array}\right] \Rightarrow \left[\begin{array}{ccc|c} 2 & 1 & -1 & 8 \\ 0 & -5 & 5 & -46 \\ 0 & 2 & 1 & 5 \end{array}\right] \Rightarrow 2R2 + 5R3$$

$R_2 = 2R_2 + -3(R_1)$

$$\Rightarrow \left[\begin{array}{ccc|c} 2 & 1 & -1 & 8 \\ 0 & -5 & 5 & -46 \\ 0 & 0 & 15 & -67 \end{array}\right] \Rightarrow \begin{aligned} 2x + y - z &= 8 \\ -5y + 5z &= -46 \\ 15z &= -67 \end{aligned} \Rightarrow$$

(columns labelled x, y, z)

$$x = -3/5 \quad y = 71/15 \quad z = -67/15$$

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2) $L = \begin{bmatrix} 1 & 0 & 0 \\ -3 & 1 & 0 \\ 1 & 2 & 1 \end{bmatrix}$ $\quad U = \begin{bmatrix} 2 & 1 & -1 \\ 0 & -5 & 5 \\ 0 & 0 & 15 \end{bmatrix}$

$y_1 = 8$

$y_2 = -11 - 3(8) = -35$

$y_3 = -3 - 35(2) + 8 = -67$

$x_3 = -67/15$

$x_2 = (-5 - 65/15)/-35 = 71/15$

$x_1 = (2 + 71/15 + 2)/8 = -3/5$

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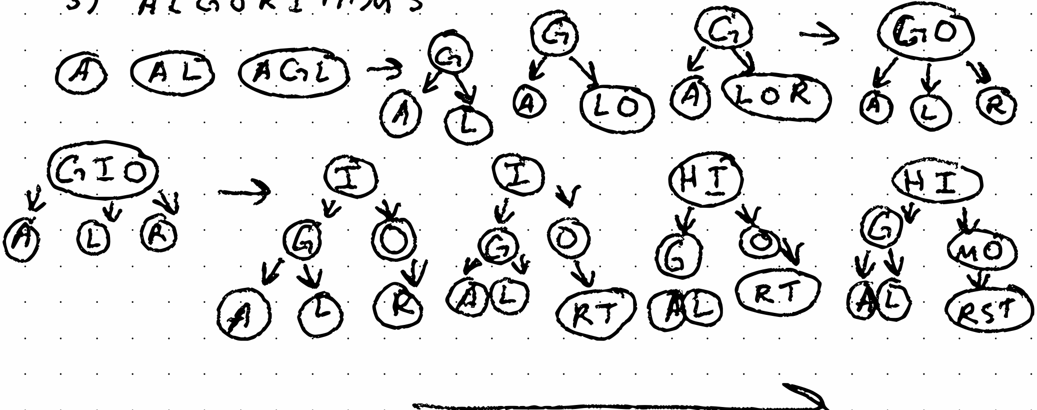
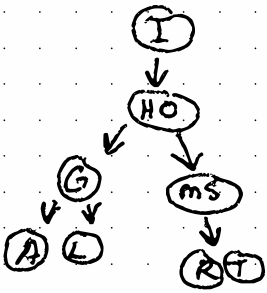
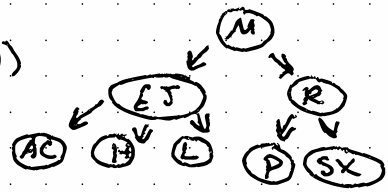
3) ALGORITHMS





4)



m	E	J	A	C	H	L	R	P	S	X
1	2	3	4	5	4	4	2	3	4	5

$\Rightarrow 37/11$