

ASSIGNMENT

02

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SEC : 18

1.

$$x_{\min} = -20$$

$$x_{\max} = 25$$

$$y_{\min} = 0$$

$$y_{\max} = 30$$

$$P_1(10, -10) \quad P_2(30, 20)$$

$$\text{outcode} = 0100$$

$$\text{outcode} = \begin{array}{c} 0010 \\ \hline 0000 \end{array}$$

partially inside.

$$D = (30 - 10, (20 + 10))$$

$$= 20, 30$$

$$t_E = 0$$

$$t_L = 1$$

Top	ND	PL/PE	t	tE	tL
top	30	PL	1.33	0	1
bottom	-30	PE	0.33	0.33	1
Right	20	PL	0.75	0.33	0.75
left	-20	PE	-1.5	0.33	.75

$$P(tE)_x = 10 + (0.33) \times 20$$

$$P(tE)_y = -10 + (0.33) \times 30$$

$$= -0.1$$

$$(16.6, -0.1)$$

$$P(tL)_x = 10 + (.75) \times 20$$

$$= 25$$

$$P(tE)_y = -10 + (.75) \times 30$$

$$= 12.5$$

$$(25, 12.5)$$

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$$M_1 = \begin{vmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{vmatrix} \quad \text{Flip X axis}$$

$$M_2 = \begin{vmatrix} \cos 90 & -\sin 90 & 0 \\ \sin 90 & \cos 90 & 0 \\ 0 & 0 & 1 \end{vmatrix} \quad \theta = 90 \text{ rotate}$$

$$= \begin{vmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$M_3 = \begin{vmatrix} 1 & 0 & -7 \\ 0 & 1 & 6 \\ 0 & 0 & 1 \end{vmatrix} \quad \text{translate } (-7, 6)$$

for $y=x$, $\theta = 45^\circ$ rotate 45° clockwise

$$M_4 = \begin{vmatrix} \cos(-45) & -\sin(-45) & 0 \\ \sin(-45) & \cos(-45) & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$= \begin{vmatrix} 0.707 & 0.707 & 0 \\ -0.707 & 0.707 & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$M_5 = \begin{vmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$M_6 = \begin{vmatrix} \cos 45 & -\sin 45 & 0 \\ \sin 45 & \cos 45 & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$= \begin{vmatrix} .707 & -.707 & 0 \\ .707 & .707 & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$\text{composite matrix} = M_6 \times M_5 \times M_4 \times M_3 \times M_2 \times M_1$$

$$= M_6 \times M_5 \times M_4 \times M_3 \times \begin{vmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$= M_6 \times M_5 \times M_4 \times \begin{vmatrix} 0 & 1 & -7 \\ 1 & 0 & 6 \\ 0 & 0 & 1 \end{vmatrix}$$

$$= M_6 \times M_5 \times \begin{vmatrix} .707 & .707 & 0 \\ .707 & -.707 & .9.191 \\ 0 & 0 & 1 \end{vmatrix}$$

$$= M_6 \times \begin{vmatrix} .707 & .707 & -.707 \\ -.707 & .707 & -.9.191 \\ 0 & 0 & 1 \end{vmatrix}$$

$$\therefore \begin{vmatrix} x' \\ y' \\ 1 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 6 \\ 0 & 1 & -7 \\ 0 & 0 & 1 \end{vmatrix} \begin{vmatrix} 5 \\ -2 \\ 1 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 0 \\ 0 & 1 & -7 \\ 0 & 0 & 1 \end{vmatrix}$$

$$= \begin{vmatrix} 6 \\ -9 \\ 1 \end{vmatrix}$$

$$x', y' = (6, -9) \text{ Am}$$