

Step-1

Consider the following expression

$$\min_{\substack{x_1 \geq 0 \\ x_2 \geq 0 \\ x_1 + x_2 = 1}} \max_{\substack{y_1 \geq 0 \\ y_2 \geq 0 \\ y_1 + y_2 = 1}} (x_1 y_1 + x_2 y_2)$$

The above expression is equivalent to following matrix

$$A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

Step-2

Let us start with the inner maximum expression.

The inner maximum is the larger of y_1 and y_2 .

Now, x concentrate on that one.

Subject to the condition, $y_1 + y_2 = 1$, the minimum of the larger y is $\frac{1}{2}$