

$$p1' \quad P' = M \cdot P$$

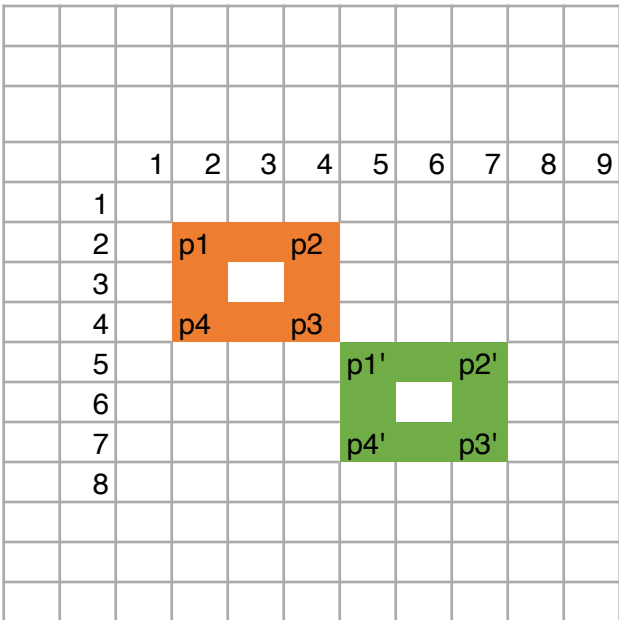
$$\begin{matrix} x \\ y \\ z \end{matrix} \begin{pmatrix} 5 \\ 5 \\ 0 \\ 1 \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 & 3 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} 2 \\ 2 \\ 0 \\ 1 \end{pmatrix}$$

Input:

$$\begin{pmatrix} 1 & 0 & 0 & 3 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} 2 \\ 2 \\ 0 \\ 1 \end{pmatrix}$$

Result:

$$\begin{pmatrix} 5 \\ 5 \\ 0 \\ 1 \end{pmatrix}$$

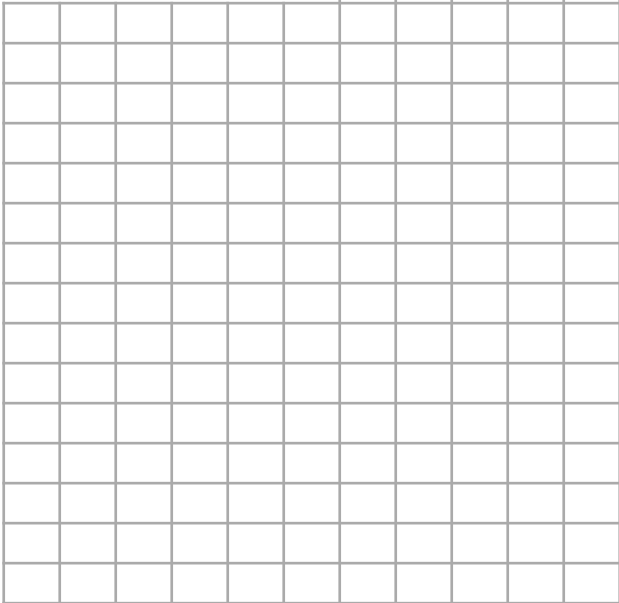


Input:

$$\begin{pmatrix} 1 & 0 & 0 & 3 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} 2 \\ 2 \\ 0 \\ 1 \end{pmatrix}$$

Result:

$$\begin{pmatrix} 5 \\ 5 \\ 0 \\ 1 \end{pmatrix}$$

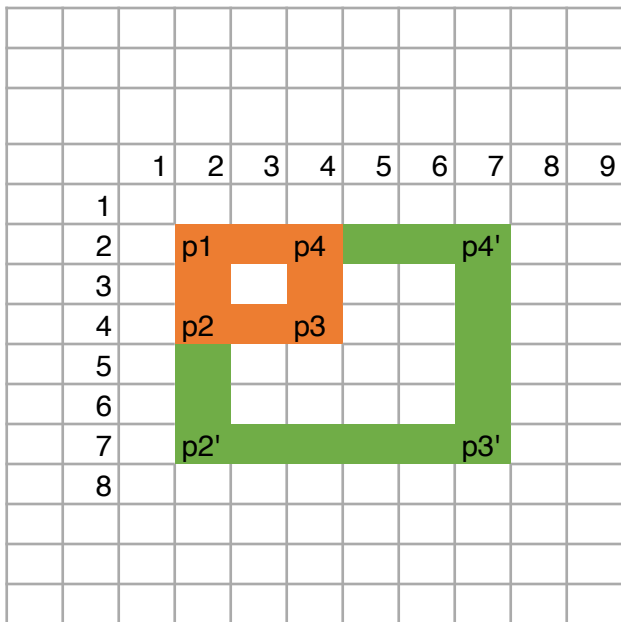


$$p1' \begin{matrix} & P' \\ \begin{matrix} x \\ y \\ z \end{matrix} & \begin{bmatrix} 7 \\ 7 \\ 0 \\ 1 \end{bmatrix} \end{matrix} = \begin{matrix} & M \\ \begin{bmatrix} 3 & 0 & 0 & 0 \\ 0 & 3 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \end{matrix} \bullet \begin{matrix} & P \\ \begin{bmatrix} 4 \\ 4 \\ 0 \\ 1 \end{bmatrix} \end{matrix}$$

$$\begin{pmatrix} 1.75 & 0 & 0 & 0 \\ 0 & 1.75 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} 4 \\ 4 \\ 0 \\ 1 \end{pmatrix}$$

Result:

$$\begin{pmatrix} 7 \\ 7 \\ 0 \\ 1 \end{pmatrix}$$



$$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} 1 \\ 0 \\ 0 \\ 1 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 1 \end{pmatrix}$$

$$p1' = \begin{bmatrix} x & 2 \\ y & 0.00 \\ z & 4 \\ & 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -0.0 & -1 & 0 \\ 0 & 1 & -0.0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 2 \\ 4 \\ 0 \\ 1 \end{bmatrix}$$

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1.570796326

$$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} 2 \\ 4 \\ 0 \\ 1 \end{pmatrix}$$

Result:

$$\begin{pmatrix} 2 \\ 0 \\ 4 \\ 1 \end{pmatrix}$$

The top grid shows a 9x9 coordinate system with columns 1-9 and rows 1-8. An orange 2x2x2 cube is centered at (3,3,3). The points are labeled as follows:

- p1: (2,2,2)
- p2: (4,2,2)
- p3: (4,4,2)
- p4: (2,4,2)

The bottom grid shows the same 9x9 coordinate system. The reconstructed 3D model is a 2x2x2 cube with a 1x1x1 cube removed from the center. The points are labeled as follows:

- p1: (2,2,2)
- p2: (4,2,2)
- p3: (4,4,2)
- p4: (2,4,2)