

What's up with matrix multiplication?! Why?!

Here's a simplified application:

Two softball teams submit equipment lists to their sponsors. The Varsity team needs 12 bats, 45 balls, and 15 gloves. The JV team needs 15 bats, 38 balls, and 17 gloves. Each bat costs \$48, each ball costs \$4, and each glove costs \$42. Use matrix multiplication to find the total cost of equipment for each team.

$$\begin{array}{c} \text{ball} \quad \text{bat} \quad \text{glove} \\ V \begin{bmatrix} 45 & 12 & 15 \end{bmatrix} \\ JV \begin{bmatrix} 38 & 15 & 17 \end{bmatrix} \end{array} \cdot \begin{array}{c} \text{price} \\ \begin{bmatrix} 4 \\ 48 \\ 42 \end{bmatrix} \begin{array}{l} \text{ball} \\ \text{bat} \\ \text{glove} \end{array} \end{array} = \begin{array}{c} \\ \\ \\ \end{array} \begin{bmatrix} \$1386 \\ \$1586 \end{bmatrix} \begin{array}{l} V \\ JV \end{array}$$

$$\begin{bmatrix} 45(4) + 12(48) + 15(42) \\ 38(4) + 15(48) + 17(42) \end{bmatrix}$$

$$\begin{bmatrix} 180 + 576 + 630 \\ 152 + 720 + 714 \end{bmatrix}$$