Neural Network Flashcards

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1.

What is a dot product?

- **Definition**: The dot product of two vectors is the sum of the products of their corresponding elements.
- **Formula**:

$$a \cdot b = \sum_{i=1}^{n} a_i b_i$$

- **Use**: Measures similarity or computes weighted sums in neural nets.

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2.

How do you multiply two matrices?

- **Rule**: Multiply rows of the first matrix with columns of the second.
- **Shape Condition**:

$$A_{(m \times n)} \cdot B_{(n \times p)} = C_{(m \times p)}$$

- **Used for**: Calculating activations between layers.

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3.

What is an eigenvector used for?

- **Meaning**: A vector whose direction doesn't change under a linear transformation.
- **Used in**: PCA, stability analysis, etc.

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4.

How do you calculate a determinant?

- **2×2 Example**:

$$det = ad - bc \quad \text{for} \quad \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

- **Use**: To check matrix invertibility.

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5.

Why are inverses important in solving systems?

- **Use**:

  Solving:

$$Ax = b \Rightarrow x = A^{-1}b$$

- **Important** in: Optimization, least squares, and backprop.