

An Example Problem

Principal Component Analysis

- Given an $n \times d$ matrix A , compute a good rank- k orthogonal Q

$$A \approx A \cdot Q \cdot Q^T$$



A

\approx



A



Q



Q^T



- Compute SVD : nd^2 time

• Very slow modern datasets

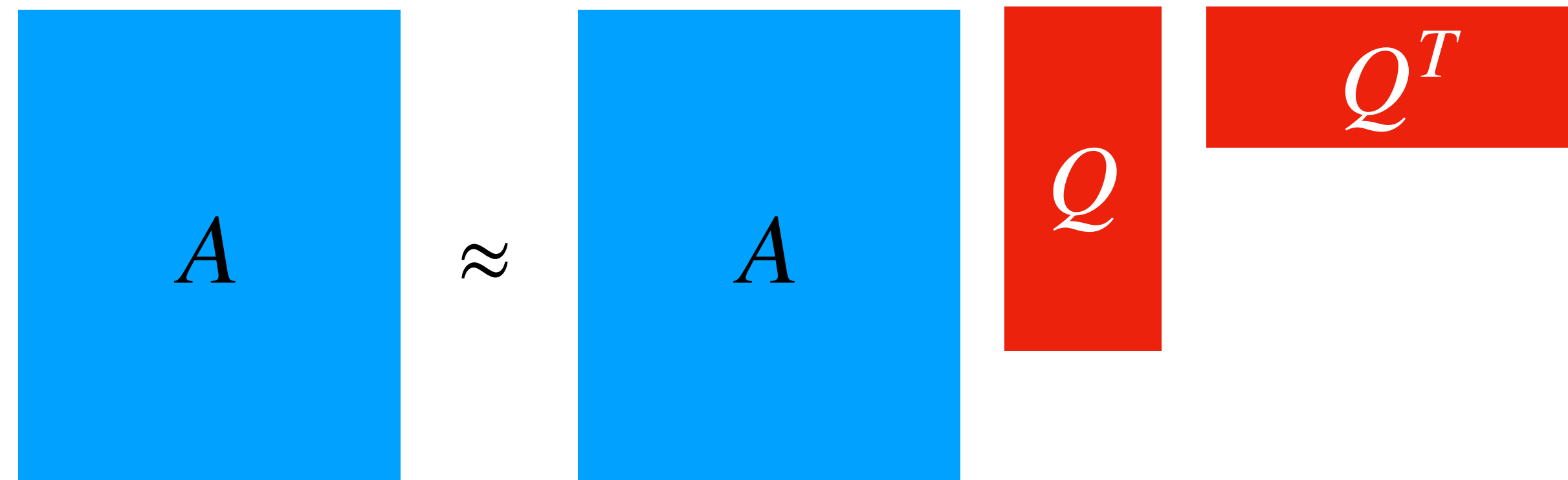
• Does not utilize sparsity

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How is Sketching Useful?

Classic Setting