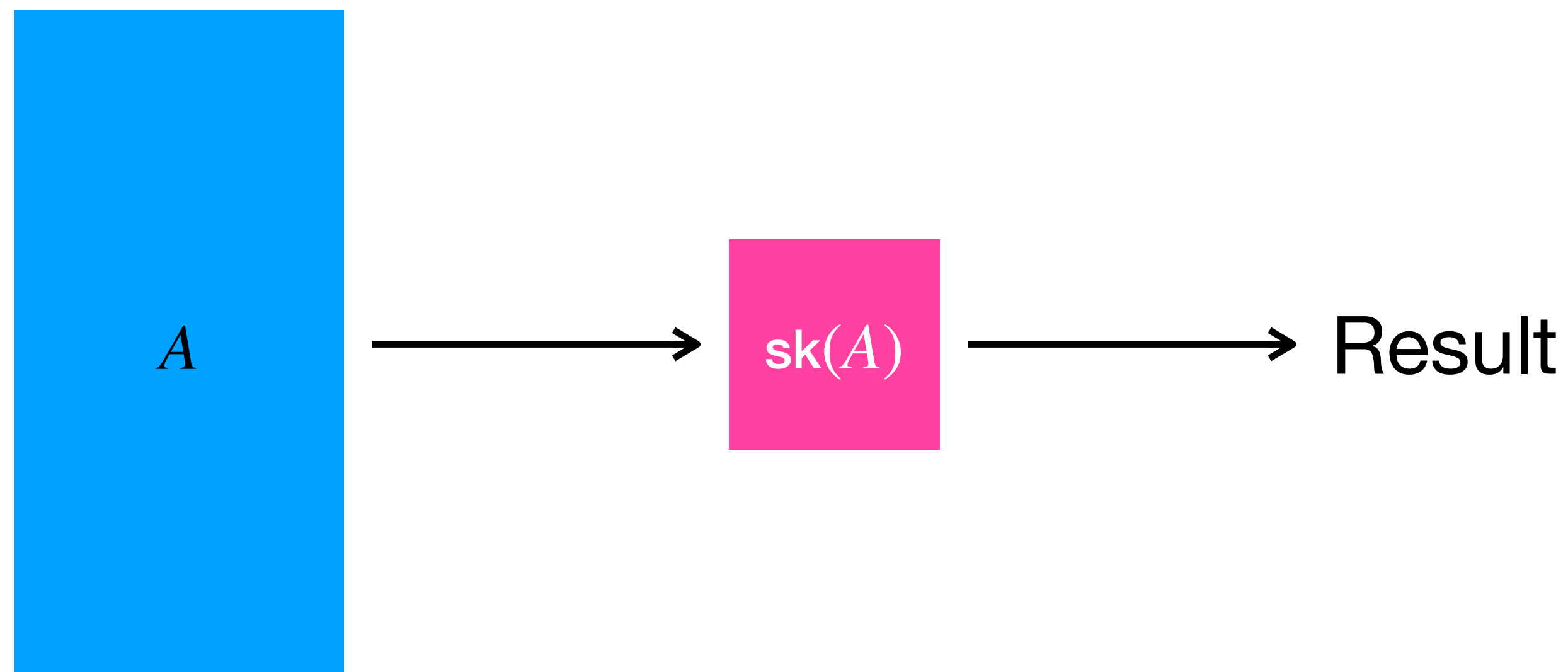


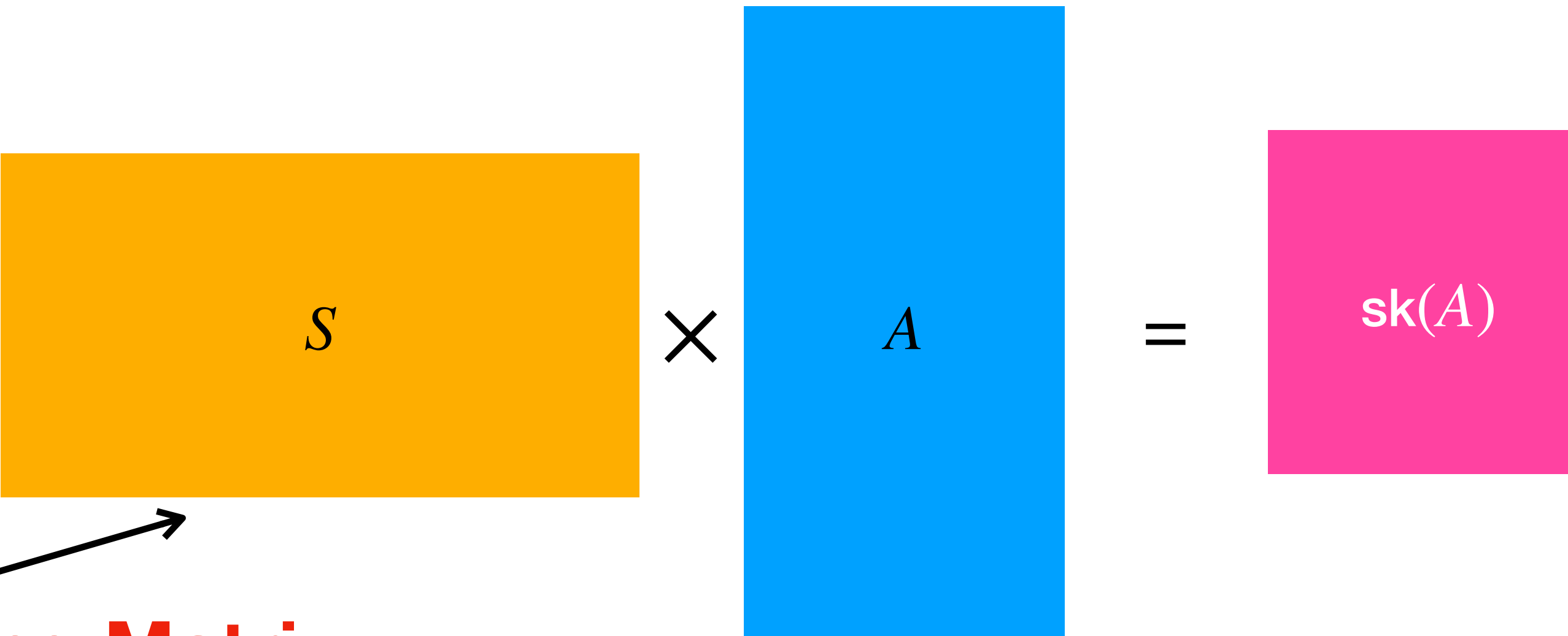
Sketching

- A broad set of techniques developed over last 20 years to handle large datasets
- Shrink the large dataset into a small dataset
- Efficiently perform computation on the small dataset



Linear Sketching

- Apply a randomized linear transform
 - CountSketch [Clarkson, Woodruff '13], OSNAP [Nelson, Nguyen '13], SRHT [Tropp '10], ...


$$S \times A = \text{sk}(A)$$

Sketching Matrix

- A good sketching matrix S consolidates information into the “sketch”