



How to Construct Sketching Matrices?

- We want to construct a sketching matrix  $S$  such that for all  $x$

- $Sx$  can be used to compute what we want to know about  $x$

- *S* can be stored efficiently

- $S_{*j}$  can be generated on-demand

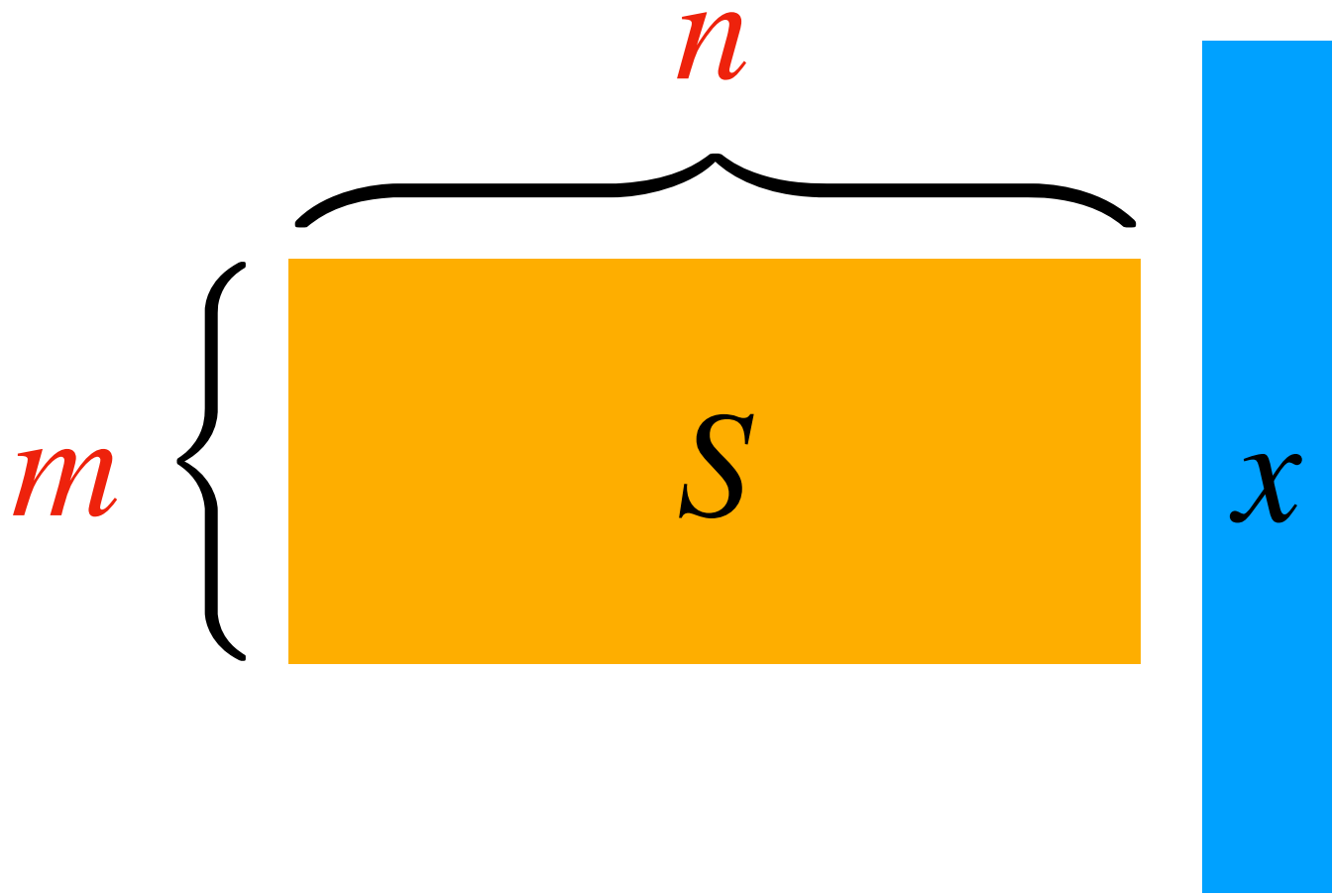
- If each  $S_{*j}$  is independently sampled from a distribution

• **Analysis is easier**



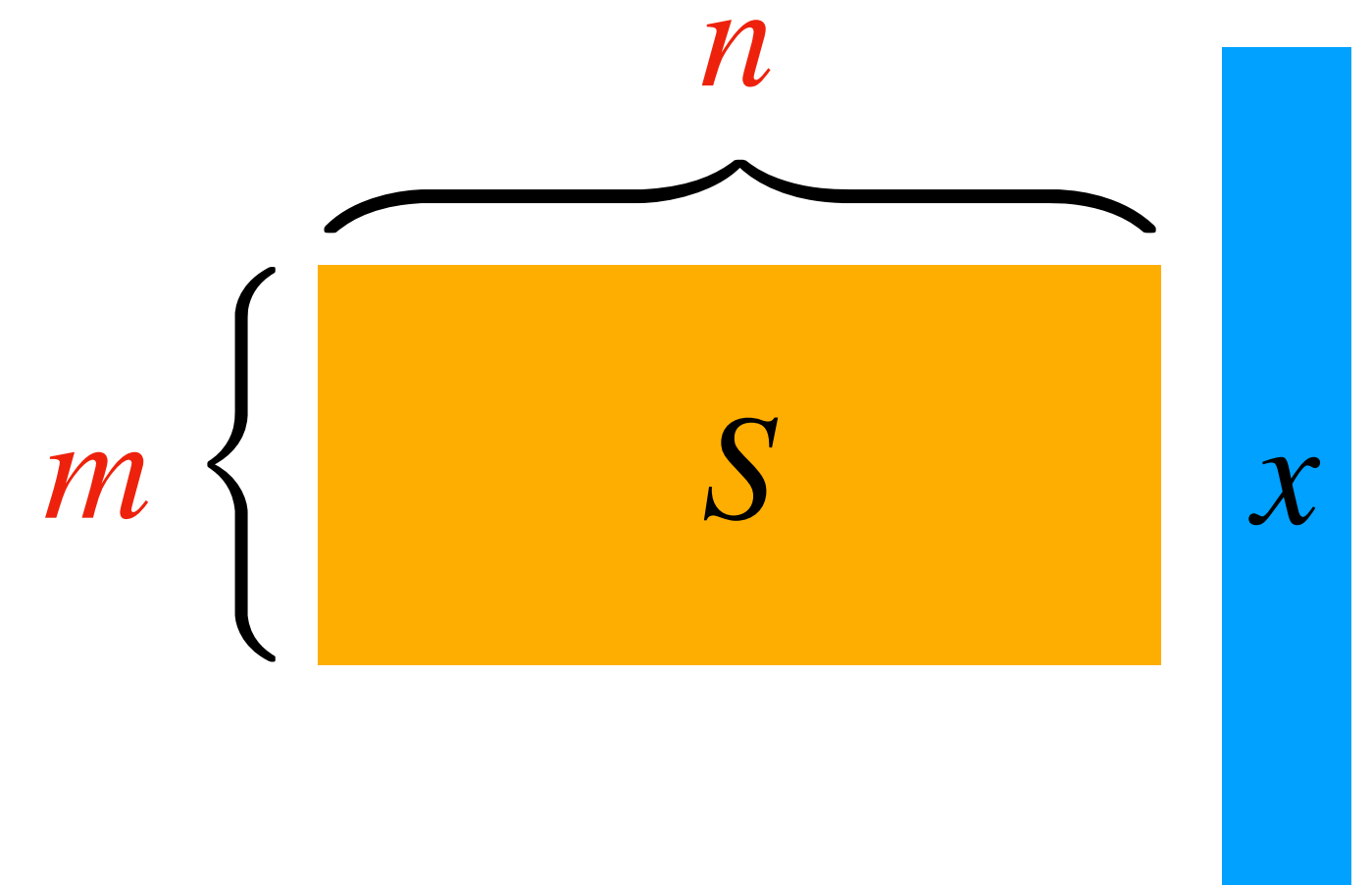
•  $\Omega(n)$  space to store  $S$





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  - $Sx$  can be used to compute what we want to know about  $x$
  - $S$  can be stored efficiently
  - $S_{*i}$  can be generated **on-demand**
- If each  $S_{*i}$  is independently sampled from a distribution
  - Analysis is easier
  - $\Omega(n)$  space to store  $S$



# Our Techniques