- Initialize $x \leftarrow 0 \in \mathbb{R}^n$

- On update (i, Δ) :

- Set $x_i \leftarrow x_i + \Delta$

- Answer queries about x using **small space**

- $\max_i |x_i| = \|x\|_\infty$

- $\sum_i |x_i|^p$ (F_p moments)

- Useful to characterize the distribution

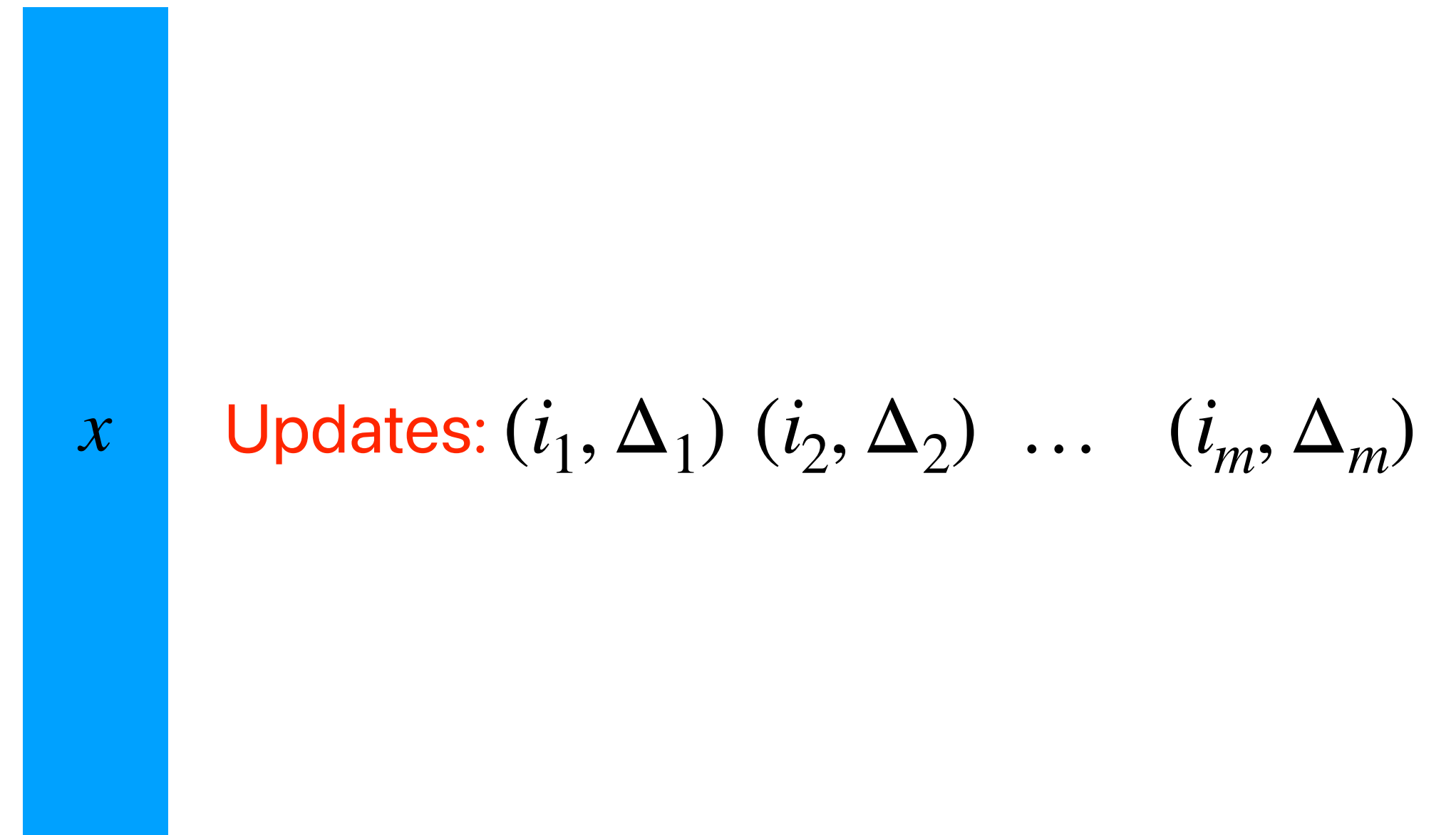- $p \in (0,2)$ to approximate the entropy of the distirbution

x

Updates: (i_1, Δ_1) (i_2, Δ_2) … (i_m, Δ_m)

Turnstile Streaming

- Initialize $x \leftarrow 0 \in \mathbb{R}^n$

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  - $\max_i |x_i| = \|x\|_\infty$

  - $\sum_i |x_i|^p \ (F_p \text{ moments})$

    - Useful to characterize the distribution

    - $p \in (0,2)$ to approximate the entropy of the distirbution

x Updates: $(i_1, \Delta_1) \ (i_2, \Delta_2) \ \ldots \ (i_m, \Delta_m)$

A Major Technique: Linear Sketching