

Turnstile Streaming

- 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

$$\bullet \sum_i |x[i]|^p$$

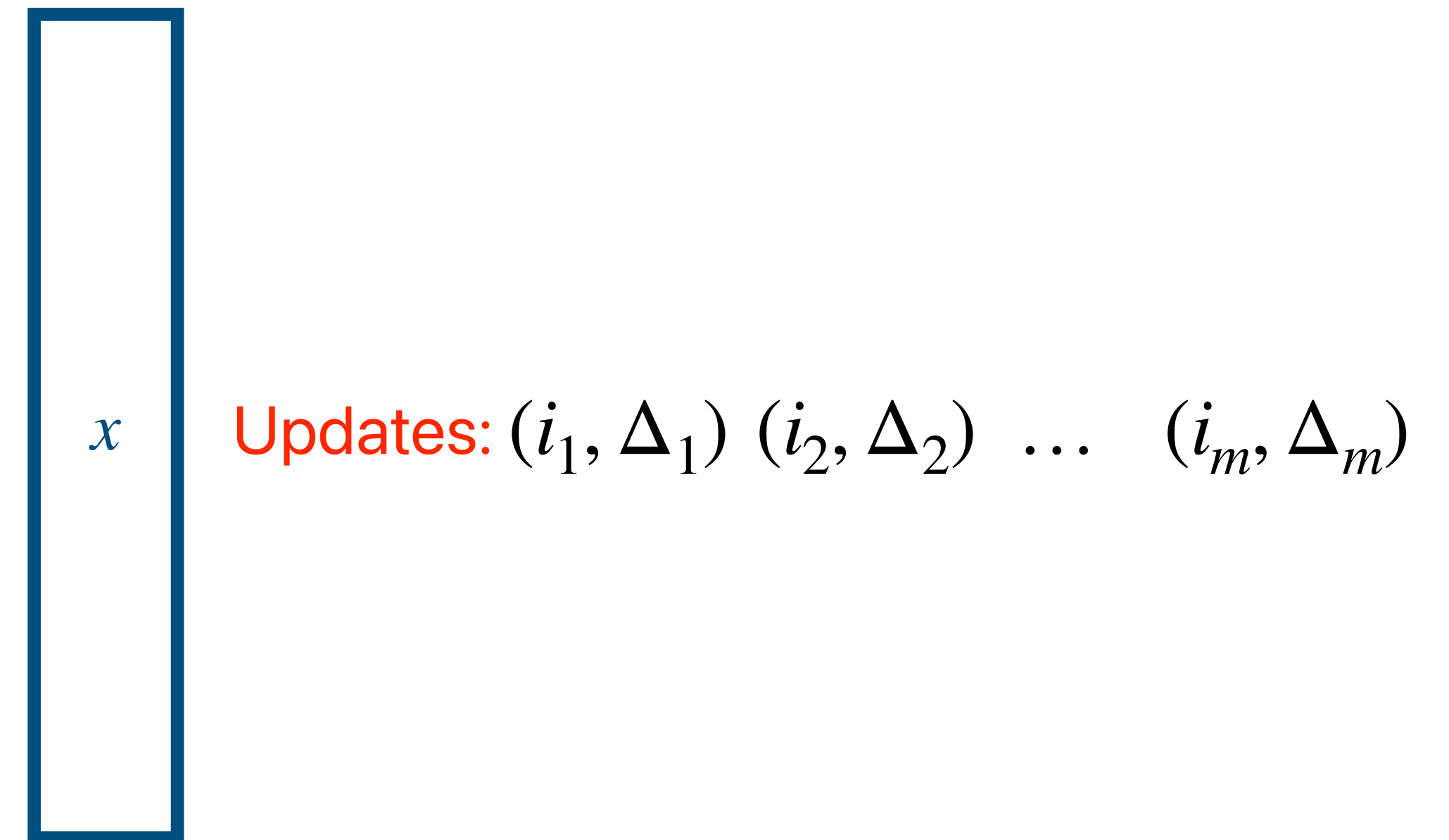
- $\max_i |x[i]|$

x

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

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 - Set $x[i] \leftarrow x[i] + \Delta$
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 - $\sum_i |x[i]|^p$
 - $\max_i |x[i]|$



Challenges