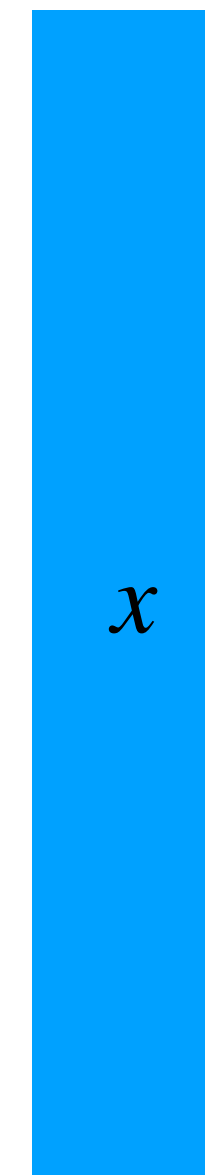


# Turnstile Streaming

- Initialize  $x \leftarrow 0 \in \mathbb{R}^n$
- On update  $(i, \Delta)$  :
  - Set  $x[i] \leftarrow x[i] + \Delta$
- Answer queries about  $x$  using **small space**
  - $\max_i |x[i]|$
  - $\sum_i |x[i]|^p$  ( $F_p$  moments)



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

# Our Results