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Using PDA for Item-KNN does not scale…

For N users and M programs: $O(N \bullet M^2)$ cryptographic operations and $O(M^2)$ ciphertexts

Approximate statistics may be ok for better efficiency

Turn to succinct data structures to compress data streams

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# Count(-Min) Sketch

Estimate an item's frequency in a stream

Mapping a stream of values (of length T) to a matrix of size O(logT)

Sum of two sketches = sketch of the union of the two data streams