Sketching for Approximate Matrix Multiplication

- We want to compute

- $Q^{\otimes p}$ and $K^{\otimes p}$ can have a large number of columns

- Can we compute matrices Q' and K' such that $Q^{\otimes p} \cdot (K^{\otimes p})^\mathsf{T} \approx Q' \cdot (K')^\mathsf{T}$?

- We can approximate using $\mathrm{LT}(Q' \cdot (K')^{\mathsf{T}}) \cdot V$

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$$\mathsf{LT}(\boldsymbol{Q}^{\otimes p} \cdot (\boldsymbol{K}^{\otimes p})^{\mathsf{T}}) \cdot \boldsymbol{V}$$

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