



Computing  $\text{LT}(A \cdot B^T) \cdot C$

•  $A_{i*}, B_{i*}, C_{i*} \in \mathbb{R}^d$  be  $i$ -th rows of the respective matrices

•  $i$ -th row of matrix  $LT(A \cdot B^T) \cdot C =$



- Compute the cumulative sums  $B_1 * C_1^T, B_1 * C_1^T + B_2 * C_2^T, \dots$

- Multiply each cumulative sum with the corresponding  $(A_{j*})^T$

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$$(A_{i*})^{\mathsf{T}} \left( \sum_{j \leq i} B_{j*} C_{j*}^{\mathsf{T}} \right)$$

# Computing $\text{LT}(A \cdot B^\top) \cdot C$

- $A_{i*}, B_{i*}, C_{i*} \in \mathbb{R}^d$  be  $i$ -th rows of the respective matrices
- $i$ -th row of matrix  $\text{LT}(A \cdot B^\top) \cdot C =$ 
$$(A_{i*})^\top \left( \sum_{j \leq i} B_{j*} C_{j*}^\top \right)$$
- Compute the cumulative sums  $B_{1*} C_{1*}^\top, B_{1*} C_{1*}^\top + B_{2*} C_{2*}^\top, \dots$
- Multiply each cumulative sum with the corresponding  $(A_{i*})^\top$

**Computing**  $\text{LT}(A \cdot B^T) \cdot C$