

Blocked matrix-matrix multiplication

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for  $i := 0, \dots, m-1$ 
  for  $j := 0, \dots, n-1$ 
    for  $p := 0, \dots, k-1$ 
       $\gamma_{i,j} := \alpha_{i,p}\beta_{p,j} + \gamma_{i,j}$ 
    end
   $\gamma_{i,j} := \tilde{a}_i^T b_j + \gamma_{i,j}$ 
end

```

$$m_b = \boxed{1}, n_b = \boxed{1}, \text{ and } k_b = \boxed{k}:$$

$$\left(\begin{array}{c|c|c} \gamma_{0,0} & \cdots & \gamma_{0,n-1} \\ \hline \vdots & & \vdots \\ \hline \gamma_{m-1,0} & \cdots & \gamma_{m-1,n-1} \end{array} \right) + := \left(\begin{array}{c} \tilde{a}_0^T \\ \vdots \\ \tilde{a}_{m-1}^T \end{array} \right) \left(b_0 \mid \cdots \mid b_{n-1} \right)$$

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for  $i := 0, \dots, m-1$ 
  for  $p := 0, \dots, k-1$ 
    for  $j := 0, \dots, n-1$ 
       $\gamma_{i,j} := \alpha_{i,p}\beta_{p,j} + \gamma_{i,j}$ 
    end
   $\tilde{c}_i^T := \alpha_{i,p}\tilde{b}_p^T + \tilde{c}_i$ 
end

```

$$m_b = \boxed{}, n_b = \boxed{}, \text{ and } k_b = \boxed{}:$$

$$\left(\begin{array}{c} \tilde{c}_0^T \\ \vdots \\ \tilde{c}_{m-1}^T \end{array} \right) + := \left(\begin{array}{c|c|c} \alpha_{0,0} & \cdots & \alpha_{0,k-1} \\ \hline \vdots & & \vdots \\ \hline \alpha_{m-1,0} & \cdots & \alpha_{m-1,k-1} \end{array} \right) \left(\begin{array}{c} \tilde{b}_0^T \\ \vdots \\ \tilde{b}_{k-1}^T \end{array} \right)$$

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for  $j := 0, \dots, n-1$ 
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   $\gamma_{i,j} := \tilde{a}_i^T b_j + \gamma_{i,j}$ 
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$$m_b = \boxed{}, n_b = \boxed{}, \text{ and } k_b = \boxed{}:$$

$$\left(\begin{array}{c|c|c} \gamma_{0,0} & \cdots & \gamma_{0,n-1} \\ \hline \vdots & & \vdots \\ \hline \gamma_{m-1,0} & \cdots & \gamma_{m-1,n-1} \end{array} \right) + := \left(\begin{array}{c} \tilde{a}_0^T \\ \vdots \\ \tilde{a}_{m-1}^T \end{array} \right) \left(b_0 \mid \cdots \mid b_{n-1} \right)$$

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for  $j := 0, \dots, n-1$ 
  for  $p := 0, \dots, k-1$ 
    for  $i := 0, \dots, m-1$ 
       $\gamma_{i,j} := \alpha_{i,p}\beta_{p,j} + \gamma_{i,j}$ 
    end
   $c_j := \beta_{p,j}a_p + c_j$ 
end

```

$$m_b = \boxed{}, n_b = \boxed{}, \text{ and } k_b = \boxed{}:$$

$$\left(c_0 \mid \cdots \mid c_{n-1} \right) + := \left(a_0 \mid \cdots \mid a_{k-1} \right) \left(\begin{array}{c|c|c} \beta_{0,0} & \cdots & \beta_{0,n-1} \\ \hline \vdots & & \vdots \\ \hline \beta_{k-1,0} & \cdots & \beta_{k-1,n-1} \end{array} \right)$$

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for  $p := 0, \dots, k-1$ 
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    for  $j := 0, \dots, n-1$ 
       $\gamma_{i,j} := \alpha_{i,p}\beta_{p,j} + \gamma_{i,j}$ 
    end
   $\tilde{c}_i^T := \alpha_{i,p}\tilde{b}_p^T + \tilde{c}_i^T$ 
end

```

$$m_b = \boxed{}, n_b = \boxed{}, \text{ and } k_b = \boxed{}:$$

$$\left(\begin{array}{c} \tilde{c}_0^T \\ \vdots \\ \tilde{c}_{m-1}^T \end{array} \right) + := \left(\begin{array}{c|c|c} \alpha_{0,0} & \cdots & \alpha_{0,k-1} \\ \hline \vdots & & \vdots \\ \hline \alpha_{m-1,0} & \cdots & \alpha_{m-1,k-1} \end{array} \right) \left(\begin{array}{c} \tilde{b}_0^T \\ \vdots \\ \tilde{b}_{k-1}^T \end{array} \right)$$

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$$m_b = \boxed{}, n_b = \boxed{}, \text{ and } k_b = \boxed{}:$$

$$\left(c_0 \mid \cdots \mid c_{n-1} \right) + := \left(a_0 \mid \cdots \mid a_{k-1} \right) \left(\begin{array}{c|c|c} \beta_{0,0} & \cdots & \beta_{0,n-1} \\ \hline \vdots & & \vdots \\ \hline \beta_{k-1,0} & \cdots & \beta_{k-1,n-1} \end{array} \right)$$