

1 Col/Row major

$$\begin{array}{c}
 \begin{array}{c|cccc}
 i \backslash j & 0 & 1 & 2 & 3 \\
 \hline
 0 & 0 & 1 & 2 & 3 \\
 1 & 4 & 5 & 6 & 7 \\
 2 & 8 & 9 & 10 & 11 \\
 3 & 12 & 13 & 14 & 15 \\
 4 & 16 & 17 & 18 & 19
 \end{array} \\
 \underbrace{\hspace{10em}}_{\text{row-major order}}
 \end{array}
 \qquad
 \begin{array}{c}
 \begin{array}{c|cccc}
 i \backslash j & 0 & 1 & 2 & 3 \\
 \hline
 0 & 0 & 5 & 10 & 15 \\
 1 & 1 & 6 & 11 & 16 \\
 2 & 2 & 7 & 12 & 17 \\
 3 & 3 & 8 & 13 & 18 \\
 4 & 4 & 9 & 14 & 19
 \end{array} \\
 \underbrace{\hspace{10em}}_{\text{column-major order}}
 \end{array}$$

2 Cache aware data storage

$$\begin{array}{c}
 \mathbf{C} = \mathbf{A} \times \mathbf{B} \\
 \\
 \begin{array}{c}
 \begin{array}{c|cccc}
 i \backslash j & 0 & 1 & 2 & 3 \\
 \hline
 0 & 0 & 1 & 2 & 3 \\
 1 & 4 & 5 & 6 & 7 \\
 2 & 8 & 9 & 10 & 11 \\
 3 & 12 & 13 & 14 & 15 \\
 4 & 16 & 17 & 18 & 19
 \end{array} \\
 \underbrace{\hspace{10em}}_{\text{matrix A row-major}}
 \end{array}
 \times
 \begin{array}{c}
 \begin{array}{c|cccc}
 i \backslash j & 0 & 1 & 2 & 3 \\
 \hline
 0 & 0 & 5 & 10 & 15 \\
 1 & 1 & 6 & 11 & 16 \\
 2 & 2 & 7 & 12 & 17 \\
 3 & 3 & 8 & 13 & 18 \\
 4 & 4 & 9 & 14 & 19
 \end{array} \\
 \underbrace{\hspace{10em}}_{\text{matrix B column-major}}
 \end{array}
 \end{array}$$