

Stacking Matrices

Hereinafter the following convention is used:

Operation	Description
horizontal stack	<p>Stacks the given matrices horizontally. The new matrix is n-by-m+k matrix.</p> <p>given:</p> $A = \begin{bmatrix} a_{0,0} & \dots & a_{0,m-1} \\ \vdots & \ddots & \vdots \\ a_{n-1,0} & \dots & a_{n-1,m-1} \end{bmatrix}_{n \times m}, B = \begin{bmatrix} b_{00} & \dots & b_{0,k-1} \\ \vdots & \ddots & \vdots \\ b_{n-1,0} & \dots & b_{n-1,k-1} \end{bmatrix}_{n \times k}$ <p>the result will be:</p> $\begin{bmatrix} a_{0,0} & \dots & a_{0,m-1} & b_{00} & \dots & b_{0,k-1} \\ \vdots & \ddots & \vdots & \vdots & \ddots & \vdots \\ a_{n-1,0} & \dots & a_{n-1,m-1} & b_{n-1,0} & \dots & b_{n-1,k-1} \end{bmatrix}_{n \times (m+k)}$ <p>Returning result:</p> <p>⇒ HorizontalStack(Matrix, Matrix)</p> <p>Out of place:</p> <p>⇒ HorizontalStack(Matrix, Matrix, Matrix)</p>
vertical stack	<p>Stacks the given matrices vertically. The new matrix is n+l-by-m matrix.</p> <p>given:</p> $A = \begin{bmatrix} a_{0,0} & \dots & a_{0,m-1} \\ \vdots & \ddots & \vdots \\ a_{n-1,0} & \dots & a_{n-1,m-1} \end{bmatrix}_{n \times m}, B = \begin{bmatrix} b_{00} & \dots & b_{0,m-1} \\ \vdots & \ddots & \vdots \\ b_{l-1,0} & \dots & b_{l-1,m-1} \end{bmatrix}_{l \times m}$ <p>the result will be:</p> $\begin{bmatrix} a_{0,0} & \dots & a_{0,m-1} \\ \vdots & \ddots & \vdots \\ a_{n-1,0} & \dots & a_{n-1,m-1} \\ b_{00} & \dots & b_{0,m-1} \\ \vdots & \ddots & \vdots \\ b_{l-1,0} & \dots & b_{l-1,m-1} \end{bmatrix}_{(n+l) \times m}$ <p>Returning result:</p> <p>⇒ VerticalStack(Matrix, Matrix)</p> <p>Out of place:</p>

VerticalStack(Matrix, Matrix, Matrix)

diagonal stack Stacks the given matrices diagonally. The new matrix is n+l-by-m+k matrix. The values of the off-diagonal blocks are unchanged.

given:

$$A = \begin{bmatrix} a_{0,0} & \dots & a_{0,m-1} \\ \vdots & \ddots & \vdots \\ a_{n-1,0} & \dots & a_{n-1,m-1} \end{bmatrix}_{n \times m}, B = \begin{bmatrix} b_{00} & \dots & b_{0,k-1} \\ \vdots & \ddots & \vdots \\ b_{l-1,0} & \dots & b_{l-1,k-1} \end{bmatrix}_{l \times k}$$

the result will be:

$$\begin{bmatrix} a_{0,0} & \dots & a_{0,m-1} & & & \\ \vdots & \ddots & \vdots & & & \\ a_{n-1,0} & \dots & a_{n-1,m-1} & & & \\ & & & b_{00} & \dots & b_{0,k-1} \\ & & & \vdots & \ddots & \vdots \\ & & & b_{l-1,0} & \dots & b_{l-1,k-1} \end{bmatrix}_{(n+l) \times (m+k)}$$

- ▲ α, β, γ – small Greek letters are used to denote scalars;
- ▲ u, v, w – small Latin letters are used to denote vectors;
- ▲ A, B, C – capital Latin letters are used to denote matrices.

Methods

diagonally.