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Chapter 1

Matrices

1.1 Row matrix

1. Row matrices whose delimiters are of the default size—and not too big.

Command	Out	put
$\row{1,2}$	(1	2)
$\text{row[delim=p]}\{1,2\}$	(1	2)
$\row[delim=b]{1,2}$	[1	2]
$\text{row[delim=B]}\{1,2\}$	{1	2}
$\text{row[delim=v]}\{1,2\}$	1	2
$\text{vow}[\text{delim=V}]\{1,2\}$	$\ 1$	2

2. Row matrices with default sized delimiters, which are too small.

Command		put
\row{\dfrac{1}{2}, \dfrac{1}{3}}	$(\frac{1}{2}$	$\frac{1}{3}$)
$\label{local_state} $$\operatorname{delim=p}_{\displaystyle 1}_{2}, \dfrac_{1}_{3}$$$	$(\frac{1}{2}$	$\frac{1}{3}$)
$\label{local_cost} $$\operatorname{delim=b}_{\operatorname{dfrac}\{1\}\{2\}, \dfrac\{1\}\{3\}\}}$$	$[\frac{1}{2}$	$\frac{1}{3}$]
$\label{local_tow_delim} $$\operatorname{D}_{\alpha_1}^2, \dfrac_{1}_{3}$$$	$\{\frac{1}{2}$	$\frac{1}{3}$
$\label{local_condition} \\ \label{local_condition} $$\operatorname{delim}_v_{\alpha}(1)_{2}, \dfrac_{1}_{3}$$$	$ \frac{1}{2}$	$\frac{1}{3}$
$\label{local_state} $$\operatorname{Vow[delim=V]}_{\dfrac\{1\}\{2\}, \dfrac\{1\}\{3\}\}}$$	$\ \frac{1}{2}$	$\frac{1}{3} \parallel$

3. Row matrices with scaled delimiters.

Command	Output	Correct output
\row*{\dfrac{1}{2}, \dfrac{1}{3}}	$\begin{pmatrix} \frac{1}{2} & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{1}{3} \end{pmatrix}$
\row*[delim=p]{\dfrac{1}{2}, \dfrac{1}{3}}	$\begin{pmatrix} \frac{1}{2} & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{1}{3} \end{pmatrix}$
\row*[delim=b]{\dfrac{1}{2}, \dfrac{1}{3}}	$\begin{bmatrix} \frac{1}{2} & \frac{1}{3} \end{bmatrix}$	$\begin{bmatrix} \frac{1}{2} & \frac{1}{3} \end{bmatrix}$
\row*[delim=B]{\dfrac{1}{2}, \dfrac{1}{3}}	$\left\{\frac{1}{2} \frac{1}{3}\right\}$	$\left\{ \frac{1}{2} \frac{1}{3} \right\}$
\row*[delim=v]{\dfrac{1}{2}, \dfrac{1}{3}}	$\begin{vmatrix} \frac{1}{2} & \frac{1}{3} \end{vmatrix}$	$\begin{vmatrix} \frac{1}{2} & \frac{1}{3} \end{vmatrix}$
\row*[delim=V]{\dfrac{1}{2}, \dfrac{1}{3}}	$\left\ \frac{1}{2} \frac{1}{3} \right\ $	$\left\ \frac{1}{2} \frac{1}{3} \right\ $

4. Row matrices with manually scaled delimiters.

Command	Out	put
$\label{lim-size} $$\operatorname{Dig}_{\sigma_1}^2, \dfrac_1, \dfrac_1, \dfrac_1, \dfrac_1, \dfrac_2, \dfrac_2,$	$\left(\frac{1}{2}\right)$	
$\label{lim-p} $$\operatorname{delim-size=\Big]}_{\operatorname{dfrac}\{1\}\{2\}, \operatorname{dfrac}\{1\}\{3\}\}$} $$$	$\left(\frac{1}{2}\right)$	
$\label{lim-b} $$\operatorname{delim-size=\Big}_{\operatorname{dfrac}_{1}_{2}, \operatorname{dfrac}_{1}_{3}_{1}}$$	$\left[\frac{1}{2}\right]$	$\left[\frac{1}{3}\right]$
$\label{lim-B} $$\operatorname{Big}_{\operatorname{Size}} $$\operatorname{Big}_{\operatorname{Size}}, \operatorname{Gas}_{\operatorname{Size}} $$$	$\left\{\frac{1}{2}\right\}$	$\frac{1}{3}$
<pre>\row[delim=v,delim-size=\Big]{\dfrac{1}{2}, \dfrac{1}{3}}</pre>	$\left \frac{1}{2}\right $	$\frac{1}{3}$
<pre>\row[delim=V,delim-size=\Big]{\dfrac{1}{2}, \dfrac{1}{3}}</pre>		$\frac{1}{3}$

1.2 Column matrix

1. Column matrices whose delimiters are of the default size—and not too big.

Command	Output	Correct output
) () (
\col{~}	()	()
\col{1}	(1)	
\col[delim=p]{1}	(1)	
\col[delim=b]{1}	[1]	
$\col[delim=B]{1}$	{1}	
\col[delim=v]{1}	1	
$\col[delim=V]{1}$	$\ 1\ $	

 $2.\,$ Column matrices with default sized delimiters, which are too small.

Command	Output
\col{\dfrac{1}{2}}	$(\frac{1}{2})$
$\label{local_col_delim} $$ \col[delim=p]_{\dfrac_{1}_{2}} $$$	$(\frac{\overline{1}}{2})$
$\label{local_collection} $$ \col[delim=b]_{\dfrac{1}{2}} $$$	$[\frac{\overline{1}}{2}]$
$\label{local_collection} $$ \operatorname{ldelim=B}_{\operatorname{dfrac}\{1\}\{2\}\} $$ $$$	$\{\frac{\overline{1}}{2}\}$
\col[delim=v]{\dfrac{1}{2}}	$ \frac{\overline{1}}{2} $
$\label{local_delim} $$ \col[delim=V]_{\dfrac\{1\}\{2\}\} $$$	$\Vert \frac{\tilde{1}}{2} \Vert$

3. Column matries with scaled delimiters.

Command	Output
\col*{\dfrac{1}{2}}	$\left(\frac{1}{2}\right)$
$\verb \col*[delim=p]{\dfrac{1}{2}} $	$\left(\frac{1}{2}\right)$
$\verb \col*[delim=b]{\dfrac{1}{2}} $	$\left[rac{1}{2} ight]$
$\verb \col*[delim=B]{\dfrac{1}{2}} $	$\left\{\frac{1}{2}\right\}$
$\verb \col*[delim=v]{\dfrac{1}{2}} $	$\left \frac{1}{2}\right $
$\verb \col*[delim=V]{\dfrac{1}{2}} $	$\left\ \frac{1}{2} \right\ $

 $4. \,$ Column matrices with (automatically) scaled delimiters.

Command	Output
\col{1;2}	$\begin{pmatrix} 1 \\ 2 \end{pmatrix}$
\col[delim=p]{1;2}	$\begin{pmatrix} 1 \\ 2 \end{pmatrix}$
\col[delim=b]{1;2}	$\begin{bmatrix} 1 \\ 2 \end{bmatrix}$
\col[delim=B]{1;2}	
\col[delim=v]{1;2}	$\begin{vmatrix} 1 \\ 2 \end{vmatrix}$
\col[delim=V]{1;2}	$\begin{vmatrix} 1 \\ 2 \end{vmatrix}$

5. Column matrices with manually scaled delimiters.

Command	Output
$\label{local_collection} $$ \operatorname{ldelim-size=\Big]_{\dfrac\{1\}\{2\}} $$$	$\left(\frac{1}{2}\right)$
$\verb \col[delim=p,delim-size=\Big]{\dfrac{1}{2}} $	$\left(\frac{1}{2}\right)$
$\verb \col[delim=b,delim-size=\Big]{\dfrac{1}{2}} $	$\left[rac{1}{2} ight]$
$\verb \col[delim=B,delim-size=\Big]{\dfrac{1}{2}} $	$\left\{\frac{1}{2}\right\}$
$\verb \col[delim=v,delim-size=\Big]{\dfrac{1}{2}} $	$\left \frac{1}{2}\right $
$\verb \col[delim=V,delim-size=\Big]{\dfrac{1}{2}} $	$\left\ \frac{1}{2} \right\ $

Command	Output
\col[delim-size=\Big]{1;2}	$\begin{pmatrix} 1 \\ 2 \end{pmatrix}$
\col[delim=p,delim-size=\Big]{1;2}	$\begin{pmatrix} 1 \\ 2 \end{pmatrix}$
\col[delim=b,delim-size=\Big]{1;2}	$\begin{bmatrix} 1 \\ 2 \end{bmatrix}$
\col[delim=B,delim-size=\Big]{1;2}	
\col[delim=v,delim-size=\Big]{1;2}	$\begin{vmatrix} 1 \\ 2 \end{vmatrix}$
\col[delim=V,delim-size=\Big]{1;2}	$\begin{vmatrix} 1 \\ 2 \end{vmatrix}$

1.3 General matrices

1. Matrices whose delimiters are of the default size—and not too big.

Command	Output	Correct output
	()) (
\mat{~}	()	
$\mathtt{Mat}\{1\}$	(1)	. ,
$\mathtt{[delim=p]}\{1\}$	(1)	
\mathbf{b}_{1}	[1]	
\mathbf{B}_{1}	{1}	
\mathbf{v}_{1}	1	
\mathbf{V}_{1}	$\ 1\ $	
$mat[delim=p]\{1,2\}$	(1 2)	
$mat[delim=b]\{1,2\}$	[1 2]	
$Mat[delim=B]\{1,2\}$	$\{1 2\}$	
$mat[delim=v]\{1,2\}$	$ 1 \ 2 $	
$Vmat[delim=V]\{1,2\}$	1 2	

2. Matrices with default sized delimiters, which are too small.

Command	Output
\mat{\dfrac{1}{2}}	$(\frac{1}{2})$
$\label{lim-p} $$ 1_{2}$$$	$(\frac{1}{2})$
$\label{lim-b} $$ 1_{2}$$	$[\frac{1}{2}]$
$\label{lim-B} $$ 1_{2}$$	$\{\overline{\frac{1}{2}}\}$
$\label{lim-v} $$ 1_{2}$$	$(\frac{1}{2}) \\ (\frac{1}{2}) \\ [\frac{1}{2}] \\ {\frac{1}{2}} \\ {1$
$\label{lem-V} $$ 1_{2}$$	$\lVert ar{rac{1}{2}} \rVert$
\mat{\dfrac{1}{2}, \dfrac{1}{3}}	$(\frac{1}{2} \frac{1}{3})$
\mat[delim=p]{\dfrac{1}{2}, \dfrac{1}{3}}	$(\frac{1}{2} \frac{1}{3})$ $(\frac{1}{2} \frac{1}{3})$ $[\frac{1}{2} \frac{1}{3}]$ $\{\frac{1}{2} \frac{1}{3}\}$ $ \frac{1}{2} \frac{1}{3} $ $ \frac{1}{2} \frac{1}{3} $
\mat[delim=b]{\dfrac{1}{2}, \dfrac{1}{3}}	$\begin{bmatrix} \overline{1} & \overline{1} \\ \overline{2} & \overline{3} \end{bmatrix}$
\mat[delim=B]{\dfrac{1}{2}, \dfrac{1}{3}}	$\{\frac{\overline{1}}{2} \frac{\overline{1}}{3}\}$
\mat[delim=v]{\dfrac{1}{2}, \dfrac{1}{3}}	$ \frac{\overline{1}}{2} \frac{\overline{1}}{3} $
$\label{lim-V} $$ \mathbf{U}_{\alpha, \beta}, \mathbf{U}_{\beta}, \mathbf{U}$	$\ \frac{\overline{1}}{2} \frac{\overline{1}}{3}\ $

3. Matrices with scaled delimiters.

Command	Output
\mat*{\dfrac{1}{2}}	$\left(\frac{1}{2}\right)$
$\label{lim-p} $$\max{\{delim=p\}} {\displaystyle \{dfrac\{1\}\{2\}\}}$$$	$\left(\frac{1}{2}\right)$
$\label{lim-b} $$\max*[delim=b]_{\dfrac{1}{2}}$$	$\left[\frac{1}{2}\right]$
$\label{lim-B} $$ \operatorname{\mathbb{I}}_{2}$$$	$\left\{\frac{1}{2}\right\}$
$\label{lim-v} $$\max*[delim=v]_{\displaystyle 1}_{2}$$$	$\left \frac{1}{2}\right $
$\label{lim-V} $$\operatorname{\mathbb{I}}_{2}}$	$\left\ rac{1}{2} ight\ $
\mat*{\dfrac{1}{2}, \dfrac{1}{3}}	$\begin{pmatrix} \frac{1}{2} & \frac{1}{3} \end{pmatrix}$
$\label{lem:p} $$\max{[delim=p]_{\left(1\right)_{2}, \left(1\right)_{3}}$}$	$\begin{pmatrix} \frac{1}{2} & \frac{1}{3} \end{pmatrix}$
\mat*[delim=b]{\dfrac{1}{2}, \dfrac{1}{3}}	$\begin{bmatrix} \frac{1}{2} & \frac{1}{3} \end{bmatrix}$
$\label{lem:bound} $$\max{[delim=B]_{\left(1\right)_{2}, \dfrac_{1}_{3}_{1}_{3}_{1}_{1}_{1}_{1}_{1}_{1}_{1}_{1}_{1}_{1$	$\left\{ \frac{1}{2} \frac{1}{3} \right\}$
\mat*[delim=v]{\dfrac{1}{2}, \dfrac{1}{3}}	$\begin{vmatrix} \frac{1}{2} & \frac{1}{3} \end{vmatrix}$
\mat*[delim=V]{\dfrac{1}{2}, \dfrac{1}{3}}	$\left\ \frac{1}{2} \frac{1}{3} \right\ $

 $4. \ \, {\rm Matrices \ with \ automatically \ scaled \ delimiters}.$

Command	Output
\mat{1; 2}	$\begin{pmatrix} 1 \\ 2 \end{pmatrix}$
\mat{1,2; 3,4}	$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$
lem:lem:lem:lem:lem:lem:lem:lem:lem:lem:	$\begin{pmatrix} \frac{1}{1} & \frac{2}{2} \\ \frac{3}{3} & \frac{4}{4} \end{pmatrix}$

5. Matrices with manually scaled delimiters.

Command	Output
$\label{lim-size} $$ \mathbf{dfrac}{1}{2}$$	$\left(\frac{1}{2}\right)$
$\label{lem:pdelim-size} $$ \mathbf{delim-p,delim-size=} {\left(\frac{1}{2}\right)} $$$	$\left(\frac{1}{2}\right)$
$\label{lem:bound} $$ \mathbf{delim-b,delim-size=} {\left(1}_{2}\right) $$$	$\left[\frac{1}{2}\right]$
$\label{lem:bize} $$ \mathbf{G}_{delim-size}(\frac{1}{2}) $$ $$ \mathbf{G}_{delim-size}(\frac{1}{2}) $$$	$\left\{\frac{1}{2}\right\}$
$\label{lim-v} $$\max[delim=v,delim-size=\Big\{\int_{1}^{2}\$	$\left \frac{1}{2}\right $
$\label{lim-V} $$ \mathbf{U}_{delim-size} \Big(\frac{1}{2} \Big) $$ \mathbf{U}_{delim-v} = \mathbb{E}_{0} \Big(\frac{1}{2} \Big) $$$	$\left\ \frac{1}{2} \right\ $
$\label{lim-size} $$ 1_{2}, \frac{1}{3}$$	$\begin{pmatrix} \frac{1}{2} & \frac{1}{3} \end{pmatrix}$
<pre>\mat[delim=p,delim-size=\Big]{\dfrac{1}{2}, \dfrac{1}{3}}</pre>	$\begin{pmatrix} \frac{1}{2} & \frac{1}{3} \end{pmatrix}$
\mat[delim=b,delim-size=\Big]{\dfrac{1}{2}, \dfrac{1}{3}}	$\begin{bmatrix} \frac{1}{2} & \frac{1}{3} \end{bmatrix}$
\mat[delim=B,delim-size=\Big]{\dfrac{1}{2}, \dfrac{1}{3}}	$\left\{\frac{1}{2} \frac{1}{3}\right\}$
\mat[delim=v,delim-size=\Big]{\dfrac{1}{2}, \dfrac{1}{3}}	$\begin{vmatrix} \frac{1}{2} & \frac{1}{3} \end{vmatrix}$
<pre>\mat[delim=V,delim-size=\Big]{\dfrac{1}{2}, \dfrac{1}{3}}</pre>	$\begin{vmatrix} \frac{1}{2} & \frac{1}{3} \end{vmatrix}$