

# mat2tex R package

Version 0.1

<https://github.com/markheckmann/mat2tex>

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To use `mat2tex` within  $\text{\LaTeX}$  documents you need to load the package first.

```
library(mat2tex)
```

It is recommended to add `\usepackage{amsmath}` in the document preamble. Otherwise not all math environments `mat2tex` includes can be used. Now we can start. Let's create the matrix  $A$ .

```
set.seed(1)
A <- matrix(runif(4), 2)
```

To display the matrix wrap the following code in `knitr` chunk with the arguments `echo=FALSE` and `results='asis'`. The following code concatenates the `texcode` chunks using the `%_%` operator. The first chunk adds the math environment `$$` as a string. The second converts the matrix  $A$  into  $\text{\LaTeX}$  code. The last one closes the `$$` environment again.

```
"$$" %_% xm(A) %_% "$$"
```

$$\begin{bmatrix} 0.266 & 0.573 \\ 0.372 & 0.908 \end{bmatrix}$$

You may use the `xx` function to get the same results.

```
xx(A)
```

$$\begin{bmatrix} 0.266 & 0.573 \\ 0.372 & 0.908 \end{bmatrix} \tag{1}$$

Here also, the shorthand `$$` environment is used which is the default in `mat2tex` as it is the standard for RMarkdown files. Working with `.Rnw` files it is convenient to change the default settings to the `\equation` environment to get numerated equations instead by typing

```
mat2tex_options(mathenvir=3)
```

Now we get numbered equations as the default.

```
xx(A)
```

$$\begin{bmatrix} 0.266 & 0.573 \\ 0.372 & 0.908 \end{bmatrix} \quad (2)$$

To reference Equation (3) you may also add a label using the `label` argument. So you can reference it using `\eqref{mylabel}` or `\ref{mylabel}` in your `.Rnw` document.

```
xx(A, label="mylabel")
```

$$\begin{bmatrix} 0.266 & 0.573 \\ 0.372 & 0.908 \end{bmatrix} \quad (3)$$

Let's create one final example. We want to display the values of the singular value decomposition of  $A$ . This time we want to use square brackets and display three digits. To achieve this set the default matrix type to `bmatrix` (the default is `pmatrix`) and to `digits=3`.

```
mat2tex_options(mtype="bmatrix", digits=3)
```

We will use the function `xmt` which is the same as `xm` except that it additionally adds a transpose sign to the matrix.

```
d <- svd(A)
xx("A = UDV^T =", d$u, diag(d$d), xmt(d$v))
```

$$A = UDV^T = \begin{bmatrix} -0.541 & -0.841 \\ -0.841 & 0.541 \end{bmatrix} \begin{bmatrix} 1.167 & 0.000 \\ 0.000 & 0.024 \end{bmatrix} \begin{bmatrix} -0.391 & -0.920 \\ -0.920 & 0.391 \end{bmatrix}^T \quad (4)$$

To find more examples and get more information have a look at the other package vignettes or visit <https://github.com/markheckmann/mat2tex>.