

Creating Matrices

Created by MathWorks for
Structural Dynamics

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$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$$

In many applications we have to organize numbers into a two-dimensional array or matrix but how do we create a matrix in MATLAB.

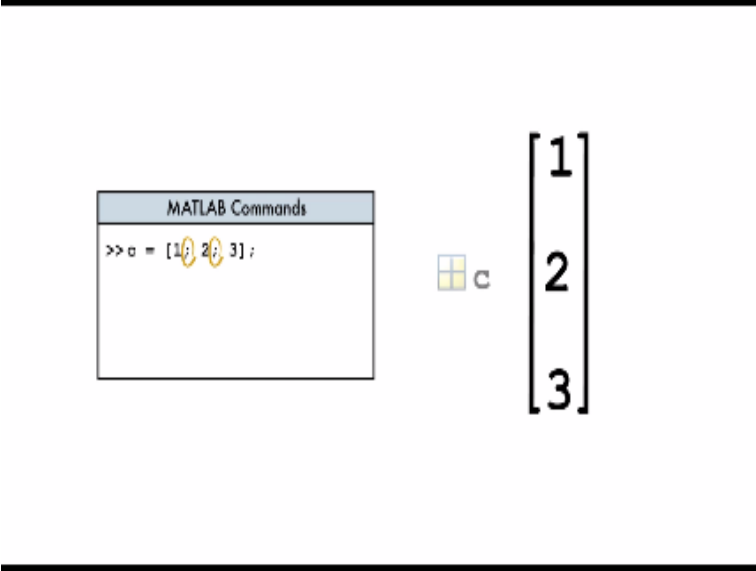
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```
MATLAB Commands  
>> r = [1, 2, 3];
```

 r
[1 2 3]

Remember that we used commas to create row vectors.

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The image shows a MATLAB Command Window with the following content:

```
MATLAB Commands  
>> a = [1; 2; 3];
```

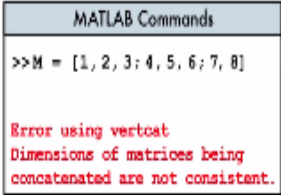
To the right of the command window, there is a small icon of a 2x2 grid followed by the letter 'c'. To the right of this icon is a column vector represented as:

$$\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

And semicolons to make column vectors. Since matrices contain both rows and columns will borrow a little from each method.

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MATLAB Commands
>>M = [1, 2, 3; 4, 5, 6; 7, 8]
Error using vertcat Dimensions of matrices being concatenated are not consistent.


$$\begin{matrix} & \begin{matrix} \text{M} \end{matrix} \\ \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \end{matrix}$$

Let us try creating a small matrix M we begin a matrix definition with a left square bracket just like a row vector we separate elements in the first row of a matrix with commas when we reach the end of the row use a semicolon to move on to the next row of numbers. We repeat the process until all the rows have been entered.

After we are done use a right square bracket to end the matrix definition, when typing in numbers by hand it is easy to make a mistake and accidentally put too many or too few elements in a row of the matrix. This results in a concatenation error message, can you spot the error we made in the line of code see if you can fix it. So we do not get an error message then try creating a few matrices of different dimensions on your own.

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