1. Lecture 1 in MATLAB
Entering arrays (External resource)

First example and exploration with MATLAB

In this ungraded problem, we explore how to enter math, comments, and display output in MATLAB.

To get started, let's learn how to enter row vectors in MATLAB. Vectors are lists of numbers entered between square brackets

```
v = [1 0];
```

The entries in the vector can be separated by spaces, as in the example above. Alternatively, they can be separated by commas for clarity if needed.

```
w = [cos(pi), sin(pi)];
```

Note that in both examples, we've used a semicolon at the end of the line. The semicolon suppresses any output when you run the MATLAB script. When you run the code, MATLAB creates a variable v and a variable w whose values are as defined. However, there is no output. To see the result, simply omit the semicolon at the end of the line.

```
w = [cos(pi), sin(pi)]
```

In the problems we give you, we will have several comments within the code box. These comments begin with a percent symbol: %

```
% Comments are not run by the code.
% Use comments to explain what parts of the code are accomplishing.
% We use the comments to explain what you should enter in the space below.
```

The way these MATLAB problems are graded requires that you create certain variables with specific names. We will often denote that there is something for you to enter by giving your the variable name, for example, $\mathbf{v}$, and setting it equal to an underscore, or several underscores.

```
v = ___ ;
```

Underscores are not allowed in MATLAB code. These lines will not run until you replace them with proper MATLAB code. We add them to indicate that you are supposed to enter code with this specific name.

Note that you can run code without submitting the code by using the "run code" button. This will run the code and give you any outputs you have not suppressed. It will not check your code against our assessments until you hit the submit button. All MATLAB problems have infinitely many attempts.

Play around in the space below. Create a row vector v of any length, with any entries. Practice making comments, and using a semicolon at the end of the line.

Your Script

Save Reset MATLAB Documentation (https://www.mathworks.com/help/)

```
1 % Create a row vector v with at least two entries.
2 % Run the code with and without the semicolon.
3
4 v = [1 2];
5
6 % Try submitting your answer! You have infinitely many attempts to submit MATLAB p
```

Run Script ()

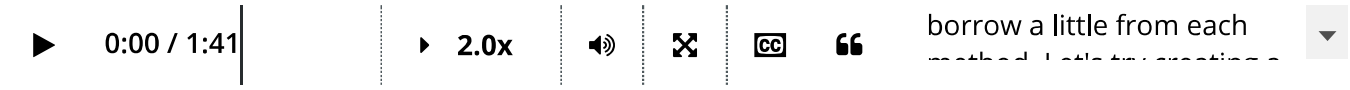
Creating matrices in MATLAB

Start of transcript. Skip to the end.

In many applications we have to organize numbers into a two dimensional array, or matrix. But

how do we create a matrix in MATLAB? Remember that we used commas to create row vectors

and semi-colons to make column vectors. Since matrices contain both rows and columns, we'll



Entering Arrays (External resource) (1.0 points possible)

Entering Vectors and Matrices

Next, we practice creating matrices and vectors in MATLAB. Recall that we use square brackets to create matrices and vectors, as we demonstrate in the following examples:

```
v1=[1 2]
```

creates the row vector $\mathbf{v}_1 = (1, 2)$

```
v2=[1; 2]
```

creates the column vector $\mathbf{v}_2 = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$. The semi colon tells MATLAB to create a new row.

```
A = [1 2; 3 4]
```

creates the 2×2 matrix $\mathbf{A} = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$.

```
B = [-1 0 4; 2 3 9]
```

creates the 2×3 matrix $\mathbf{B} = \begin{bmatrix} -1 & 0 & 4 \\ 2 & 3 & 9 \end{bmatrix}$.

Use the MATLAB template below to enter the following arrays into MATLAB:

1. The 1×3 row vector $\mathbf{v}_1 = [-1, 2, 4]$
2. The 4×1 column vector $\mathbf{v}_2 = \begin{bmatrix} -1 \\ 0 \\ 2 \\ 1 \end{bmatrix}$
3. The 3×3 square matrix $\mathbf{A} = \begin{bmatrix} -1 & 1 & 9 \\ 0 & 0 & 1 \\ -2 & -3 & 2 \end{bmatrix}$
4. The 2×4 matrix $\mathbf{B} = \begin{bmatrix} 1 & 1 & 2 & 3 \\ 5 & 8 & 13 & 21 \end{bmatrix}$

Your Script

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```
% Firstly define the row vector v1 defined above
v1 = [-1,2,4];
% Note that we end the line with a semicolon. This just tells MATLAB not to output
%
% Now define the column vector v2 defined above.
v2 = [-1;0;2;1]
% Now define the square matrix A defined above.
A = [-1 1 9; 0 0 1; -2 -3 2]
% Now define the matrix B defined above.
B = [1 1 2 3; 5 8 13 21]

```

Run Script ()

Assessment: Correct

Submit ()

- Value of v1
- Value of v2
- Value of A
- Value of B

Output

```
v2 =
```

1. Lecture 1 in MATLAB

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