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# Max Kramer

I affirm I have adhered to the honor code on this assignment.

*Hello again, scientist! I'll write in italics, and problems for you will always be in **bold**. As a general rule, I expect you to do at least as much writing as I do. Code should be part of your solution, but I expect variables to be clear and explanation to involve complete sentences. Cite your sources; if you work with someone in the class on a problem, that's an extremely important source.*

## Problem 2.1.

*To do any real scientific work in MATLAB, you have to be able to import data. The file HM.csv is an example of a matrix saved as a text file. Put it in the same folder as this .m file.*

**Import the data as HM. Use a semicolon; HM stands for "huge matrix."**

```
HM = csvread('HM.csv');
```

```
% The csvread() function takes a csv file in the current working
    directory and imports it into MATLAB as a matrix.
```

*HM is the augmented matrix of a system. **How many equations and variables does the system have?***

```
% The system contains 99 variables and 100 equations. As the matrix HM
    is augmented and has 100 columns, there are 100-1=99 variables.
```

**Row-reduce HM. Show me the 5x5 lower right-hand corner.**

```
HM_rr = rref(HM);
HM_rr(end-4:end, end-4:end)
```

```
% After using rref() to row reduce the matrix HM, slicing the result
    from the 4th to last row to the last row and the 4th to last column
    to last column produces the last 5 rows and columns as a result.
```

ans =

1.0000	0	0	-0.0530	0.6458
0	1.0000	0	0.3818	-1.9273
0	0	1.0000	0.4754	-0.0976
0	0	0	0	0
0	0	0	0	0

*Is HM consistent? If so, is the solution unique? **Explain.***

```
% The Matrix HM is consistent, as the row reduced form of HM does not
    have any rows of the form 0 = b where b is nonzero. The solution is
    unique as there are no free variables.
```

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