



Introduction to Matlab

1/25/2008





Opening Discussion

- Do you have any questions about the assignment that is due today?
- Let's go over how to turn it in.
- What did we talk about last class?





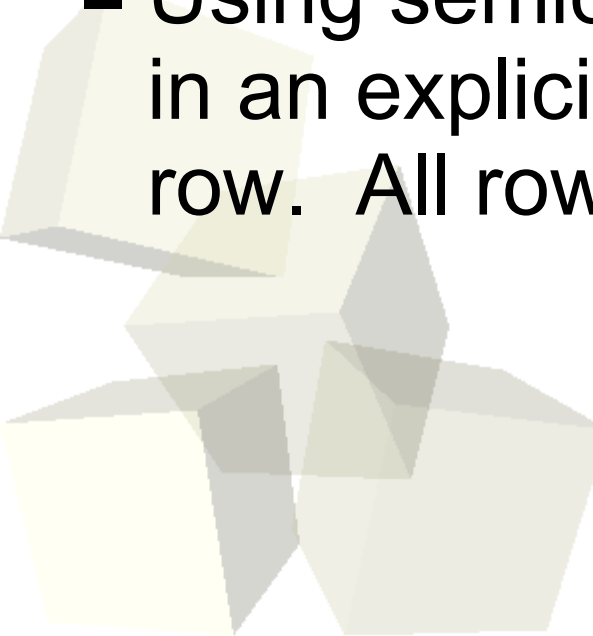
- Single line comments in Matlab begin with %. The rest of the line is a comment.
- You can also make code blocks by enclosing the comment between %{ and %}.
- You'll want to have these in your m-files to help explain things. You can put them in the interactive environment as well if you just like typing more.





Array Construction and Orientation

- What are some different ways of making arrays in Matlab? How many ways can you make an array of numbers between 1 and 10?
- Normally these arrays come out as row-arrays. All the values are in a single row. We can also take the transpose of them to get a column array. How do we take the transpose in Matlab?
- Using semicolons or line feeds between elements in an explicit creation puts elements on the next row. All rows must have the same size.



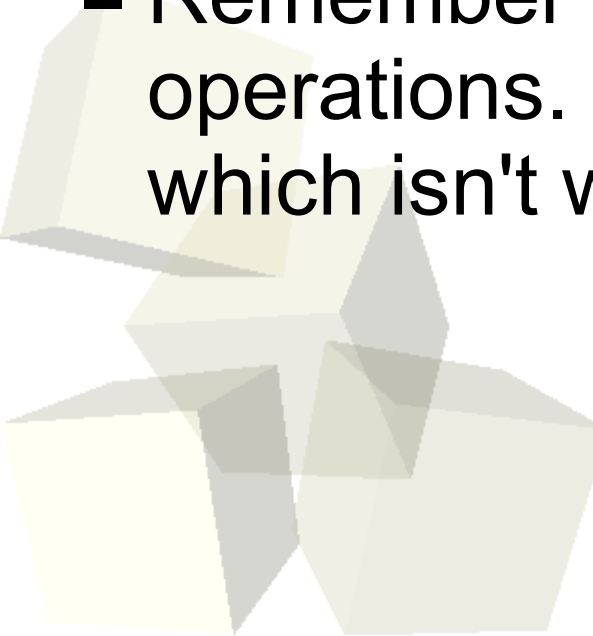


- Matlab provides a number of helpful functions to make arrays.
 - ♦ ones
 - ♦ zeros
 - ♦ eye – Identity matrix
 - ♦ rand – Random elements
 - ♦ diag – Only has diagonal elements





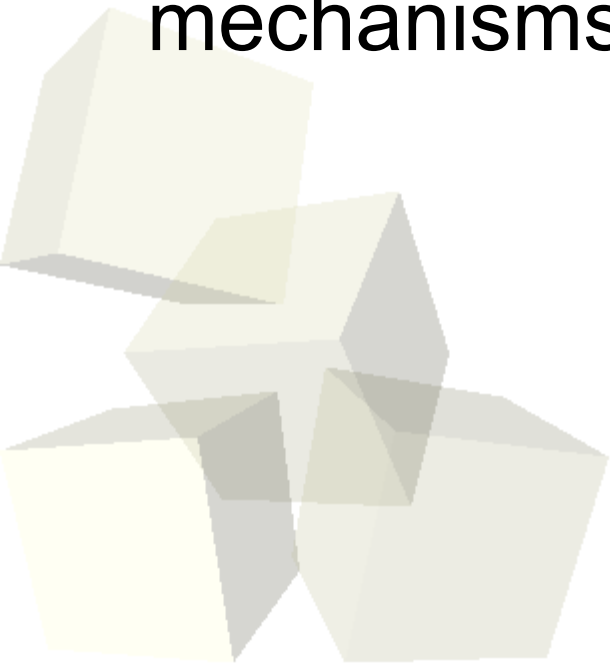
- Let's write code that will do one iteration of the Serpenski's triangle. We want a matrix with the 3 points as 3 rows and a value for the current point. We want to move half way to one of the 3 points. This can use both scalar-array and array-array mathematics.
- Scalars are “expanded” to work with arrays.
- Remember to put a `.` before the array-array operations. Otherwise you get matrix operations which isn't what you want here.





Array Manipulation

- Indexing into arrays is very powerful in Matlab. You can pull full rows and columns with `:`.
- You can also change the shape of arrays with `reshape`.
- You can't read out of bounds, but you can assign there and the array will grow.
- Logical arrays allow more powerful selection mechanisms.





Sorting, Searching, and Size

- The sort function sorts arrays.
- The find function searches for things in them.
- The size and length functions tell you how big they are.





Concluding Remarks

- What do you think about the fact that you can do so much “looping” through arrays without ever writing a loop?
- Quiz #1 will be on Monday. Remember that assignment #1 is due today.

