ENGR 1181 | MATLAB 4: Array Accessing and Strings
In-Class Guide

Learning Objectives
1. Demonstrate proper notation for accessing elements from previously assigned one-dimensional arrays (e.g. single elements, list of elements) and two-dimensional arrays (e.g. those with rows and columns).
2. Recognize built-in functions in MATLAB and how they can be used with vectors.
3. Explain that a string is a one dimensional array and can be used the same way as numeric arrays

Textbook Reading
Chapter 2.5 – 2.10

Topics
This lecture contains the following topics:
1. Vector addressing/indexing
2. Vector functions
3. Addressing a range of elements
4. Matrix addressing/indexing
5. Strings

Outline
Below is an outline of the topics and the order in which they should be covered:

1. What is addressing (Instructor’s In-class Activity)
   a. Each element in a vector has an address, also called an index
   b. Indexing starts at 1 (not 0) in MATLAB
   c. We can access/retrieve/extract the individual elements by referring to their addresses
   d. Useful for transforming data or doing calculations with only part of a vector

2. Vector functions (Instructor’s In-class Activity)
   a. MATLAB has many built-in functions we can use with vectors. For example:
      i. max()
      ii. min()
      iii. length()
      iv. zeros()
      v. ones()
3. **Addressing a Range of Elements in a Vector (Instructor’s In-class Activity)**
   a. The colon operator allows us to access a range of elements in a vector
   b. This is useful if we want to extract or alter only a portion of an existing vector.

4. **Matrix Addressing and Indexing (Instructor’s In-class Activity)**
   a. Works very similarly to vector addressing
   b. Individual elements are addressed by their row number and column number
      i. If a matrix has ‘m’ number of rows and ‘n’ number of columns, it’s an m by n matrix (m,n)
   c. Addressing a range of elements in a matrix
      i. colon operator
   d. Extracting elements from a matrix

5. **Strings (Instructor’s In-class Activity)**
   a. Lines of text and can be used instead of numerical values.
   b. Strings can include letters, digits, other symbols, and spaces.
   c. They are defined inside single apostrophes.
   d. When a variable is defined as a string, the characters are stored in an array just as numbers are. Each character, including a space, is an element in the array.

6. **Students will complete Part 1 of the assignment to turn in by the end of class. Once finished, students may start on Part 2 due by the next class. Students will submit Part 1 of the assignment to the Carmen dropbox as a PDF.**