BYTES AND BEATS

MATLAB Vocabulary

MATLAB – A programming language and interactive environment used by engineers and scientists around the world to analyze and model applications, such as Mars rover, airplanes, playing music, and many more.

Command Window – The writing area in MATLAB that has the ">>" prompt. Single line commands can be executed directly from here.

Workspace – The area that contains all the variables you create and store in memory during a MATLAB session.

Numeric arrays – a list or vector of numbers. The arrays are created within brackets [ ].

- *Column vector* – a special array that has several rows(n) and only 1 column. The dimensions are [nx1]. The values need to be separated by a semicolon.
  E.g.
  ```
  >> ColumnVector = [1;2;3;4]
  ```
  (semicolons indicate that the elements are listed vertically)
- *Row vector* – a special array that has only 1 row and several columns(n). The dimensions are [1xn]. The values need to be separated by a comma or a space.
  E.g.
  ```
  >> RowVector1 = [1,2,3,4]
  >> RowVector2 = [1 2 3 4]
  ```

Character Arrays – a word or sentence is considered an array of characters, which can be created by using the single quotes ' '.

E.g.
```
>> charArray = 'I love MATLAB'
```

Indexing – Assigning an index value of each element in an array. This makes it easy to extract particular values from an array. To extract the 5th element from an array called myVarArray we need to type myVarArray(5).

Script – A program file that executes a series of MATLAB statements or commands but cannot take inputs or give outputs.

Function – Similar to scripts but can accept input arguments and produce outputs.

For loop – Executes a block of code repeatedly for a specific number of times (e.g., the following executes 10 times).

E.g.
```
for i = 1:10
…
end
```

While loop – Executes a block of code repeatedly while a certain condition holds true. (e.g., the following executes the code while x is less than 10)

E.g.
```
while x < 10
…
end
```

If-else-end – Checks whether a certain condition is true. If true, the code executes the block of code inside the if branch; otherwise it executes the block of code inside the else branch.

E.g.
```
if x < 0
…
else
…
end
```

Adding arrays – If there are two different instruments we want to play together, then we add the arrays. E.g., guitar = [1; 1; 1; 1; 1] and clarinet = [2; 2; 2; 2; 2]. Then combined = guitar + clarinet = [3; 3; 3; 3; 3]. It is important to remember that we can add only two arrays of the same dimensions and both need to be either row vectors or column vectors.

Concatenating arrays – If we want to play the instruments one after the other, we concatenate the arrays. In this case, combined = [guitar; clarinet] = [1; 1; 1; 1; 1; 2; 2; 2; 2; 2].