MATH 3341 — Fall 2019
Lab 02: Variables, Arrays, and Scripts

Download `Math.3341.Lab.02.zip`, unzip it by following the Windows Instructions on WyoCourses. Change the current working directory of MATLAB to the unzipped folder, and type `edit lab_02_script` in the Command Window.

1 Defining Variables

(a) Define the variable `old_sin_pi = sin(pi)`, then define `pi = 1.25`, and compute `new_sin_pi = sin(pi)`. Compare `old_sin_pi` and `new_sin_pi`.

(b) Now define `sin = 2.1`. Use `who` and then `whos` to display the list of your currently used variables. Then, evaluate `sin(pi)` in the `try-catch` block.

(c) Assign `5 + i`, `6 + j` to `a`, `b`, respectively. Then perform summation to `a` and `b` and assign the result to `c`.

2 Arrays: Vectors & Matrices

(a) Use `clear` command to clear the variables in the Workspace.

(b) Use `linspace` to create a vector x with 10 entries ranging from 0 to 2π, then assign the transpose of `x` to the variable named `x_transpose` using either `'` or `transpose`. Then use the function `length` to find the length to `x_transpose`.

(c) Use either `:` or `colon` to create a column vector `v`, of which the range is from 2 to 25 with step size 2. Then use `reshape` to change `v` to a 3×4 matrix `V`. Find the size of `V` using `size`.

(d) Define the following two matrices,

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, \quad B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}.$$

Then store the result of matrix multiplication `A * B` to `C` and the result of element-wise multiplication `A .* B` to `D`. Observe the difference between these two operations.

(e) Create a 5×5 magic square matrix `M`. Extract the submatrix of `M` (from row 2 to row 4 and from column 3 to column 5), and store the submatrix to `M_submatrix`. Then create a vector `M_last_col` by extracting the last column of `M`.

(f) Create a 4×4 identity matrix `I` using `eye`, a 6×3 all-one matrix `N` using `ones`, a 3×4 all-zero matrix `O` using `zeros`.

In the Command Window enter the command `diary('lab_02_output.txt')`, run the script file `lab_02_script.m`, then type `diary off` to store the output to `lab_02_output.txt`. Then upload the script file `lab_02_script.m` and output file `lab_02_output.txt` to Overleaf. Recompile, and submit the generated `.pdf` file to WyoCourses.