CS101: Homework #5
This assignment is due by 03/29.

2.15 Exercises.

1. Answer the following questions for the array shown here.

\[
\text{Array1} = \begin{bmatrix}
0.0 & 0.5 & 2.1 & -3.5 & 6.0 \\
0.0 & -1.1 & -6.6 & 2.8 & 3.4 \\
2.1 & 0.1 & 0.3 & -0.4 & 1.3 \\
1.1 & 5.1 & 0.0 & 1.1 & -2.0
\end{bmatrix}
\]

(a) What is the size of array1?
(b) What is the value of array1(1,4)?
(c) What is the size and value of array1(:,1:2:5)?
(d) What is the size and value of array1([1 3], end)?

2. Are the following MATLAB variable names legal or illegal? Why?
(a) dog1
(b) 1dog
(c) Do_you_know_the_way_to_san_jose
(d) _help
(e) What’s_up?

3. Determine this size and contents of the following arrays. Note that the later arrays may depend on the definitions of arrays defined earlier in this exercise.
(a) \( a = 2:3:8; \)
(b) \( b = [a’ a’ a’]; \)
(c) \( c = b(1:2:3, 1:2:3); \)
(d) \( d = a + b(2,:); \)
(e) \( w = [\text{zeros}(1,3) \text{ones}(3,1)’ 3:5’ ]; \)
(f) \( b([1 3], 2) = b([3 1], 2); \)
(g) \( e = 1:-1:5; \)

4. Assume that array array1 is defined as shown, and determine the contents of the following subarrays:

\[
\text{Array1} = \begin{bmatrix}
1.1 & 0.0 & -2.1 & -3.5 & 6.0 \\
0.0 & -3.0 & -5.6 & 2.8 & 4.3 \\
2.1 & 0.3 & 0.1 & -0.4 & 1.3 \\
-1.4 & 5.1 & 0.0 & 1.1 & -3.0
\end{bmatrix}
\]

(a) array1(3,:)
(b) array1(:,3)
(c) array1(1:2:3, [3 3 4])
(d) array1([1 1],:)

- 2 -
5. Assume that \texttt{value} has been initialized to $10\pi$, and determine what is printed out by each of the following statements.

\begin{verbatim}
    disp( ['value = ' num2str(value)] );
    disp( ['value = ' int2str(value)] );
    fprintf( 'value = %e\n', value);
    fprintf( 'value = %f\n', value);
    fprintf( 'value = %g\n', value);
    fprintf( 'value = %12.4f\n', value);
\end{verbatim}

6. Assume that \texttt{a}, \texttt{b}, \texttt{c}, and \texttt{d} are defined as follows, and calculate the results of the following operations if they are legal. If an operation is illegal, explain why it is illegal.

\begin{verbatim}

(a) results = a + b;
(b) results = a * d;
(c) results = a .* d;
(d) results = a * c;
(e) results = a .* c;
(f) results = a \ b;
(g) results = a .\ b;
(h) results = a .^ b
\end{verbatim}

7. Evaluate each of the following expressions:

(a) $11 / 5 + 6$
(b) $(11 / 5) + 6$
(c) $11 / (5 + 6)$
(d) $3 ^ 2 ^ 3$
(e) $3 ^ (2 ^ 3)$
(f) $(3 ^ 2) ^ 3$
(g) \texttt{round}($-11/5$ ) + 6
(h) \texttt{ceil}($-11/5$ ) + 6
(i) \texttt{floor}($-11/5$ ) + 6

8. Use MATLAB to evaluate each of the following expressions.

(a) $(3 - 4i)( -4 + 3i)$
(b) $\cos^{-1} (1.2)$