General Sir John Kotelawala Defence University
Faculty of Engineering
Department of Mathematics
Mathematical Software - MA 1232

Learning Outcomes Covered: LO1
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Intake 39 - Semester 2 | Tutorial 01 | 15.08.2022

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1. Evaluate the following expressions using the MATLAB arithmetic hierarchy expressed with a minimum number of parenthesis.
   Assume $x = 20$, $y = 10$, $z = 5.6$

   (a) $a = xyz$

   (b) $b = x^{0.15} + \dfrac{y^{0.25}}{z^{0.35}}$

   (c) $c = xcos\dfrac{\pi z}{xy}$

   (d) $f = e^{x\sqrt{121}}y^z$

   (e) $g = log_e(e^x) + log_{10}(yz)$

   (f) $h = cos\dfrac{y}{x} + sin^2\dfrac{y}{x}$

   (g) $s = \dfrac{ln(x^3 - 5) + 3}{e^{sin(2y+z)} - 3z}$

   (h) $q = x\pi(yz\pi)^3$

2. Write a MATLAB program that evaluates the hypotenuse of a right triangle with sides $A = 4$ and $B = 3$.

3. Write a program that returns the average value giving three arbitrary numbers represented by the variables A,B, and C. Test the program for $A = 35$,$B = 21$, and $C = 13$.

4. The period T of an oscillating pendulum is given as $T = 2\pi\sqrt{L/g}$ where L is the length of the pendulum and g is the acceleration due to gravity (use $g = 9.81ms^{-2}$). Calculate the period of a $100mm$ long pendulum.

5. The distance between two points (x_1, y_1) and (x_2, y_2) on a Cartesian coordinate plane is given by the equation

   $$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}.$$

   Calculate the distance between the points $(2, 3)$ and $(8, -5)$.

6. Which of the following is a suitable file name that can be used to save a script file? Explain your answer.

   (a) det.m

   (b) sun.m

   (c) two jars.m

   (d) 2D.m

   (e) r$.m

   (f) _lon.m

   (g) mean.m

   (h) for.m

   (i) car4v.m

   (j) foo.m

7. Given the function $y(t) = e^{2t}sin(t)cos(t)$. Create the script file sin_exp.m that returns the tabular form of $y(t)$ verses t.

8. Write a function file (name it myfunc.m) for the function $f(x) = \dfrac{x^4\sqrt{3x+5}}{(x^2+1)^2}$. The input to the function is x and output is $f(x)$. The function myfunc.m should be accommodated an input of vector x.Use the function to calculate :

   (a) $f(x)$ for $x = 6$.

   (b) $f(x)$ for $x = [1, 3, 5, 7, 9, 11]]$.