MATLAB: Introduction
Part 1 – Assignment

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Assigned: September 8th, 2011
Due: September 13th, 2011

This assignment will **not** be graded; therefore, it is optional. Use it as a form of exercising what we covered in class. It is recommended that you create a function or script M-file with code cells corresponding to the problems and/or their parts (let us call it *main* M-file). This function or script can then call other M-files or subfunctions. Publish your *main* M-file to HTML. Finally, compress all the necessary files into a `.zip` or `.tar` file and e-mail it to me at bacalfa@cmu.edu.

Problem 1

Calculate the value of the function $y(x) = |x| \sin x^2$ for values of $x = \frac{\pi}{3}$ and $\frac{\pi}{6}$.

Hint 1: Use the MATLAB command `abs(x)` to calculate $|x|$.
Hint 2: You do not have to create a subfunction or a function M-file for this problem if you do not want to.

Problem 2

Create the following vectors and matrices and perform the operations.

Hint 1: Create variables to store the vectors and matrices to help you do the calculations.
Hint 2: Use the command `eye(n)` to create an `n-by-n` identity matrix.

(a)

$$\begin{bmatrix} 1 \\ -3 \\ 2 \end{bmatrix} + \begin{bmatrix} -1 \\ 3 \\ -2 \end{bmatrix} = \begin{bmatrix} ? \\ ? \\ ? \end{bmatrix}$$

(b)

$$3\begin{bmatrix}2.6 & 3.5 & -8.9\end{bmatrix}\begin{bmatrix}-2\\-9\\5\end{bmatrix} - \frac{4}{3} = ?$$

(c)

$$\begin{bmatrix}1 & 2\\2 & 1\end{bmatrix}\begin{bmatrix}-1\\1\end{bmatrix} + 0.7\begin{bmatrix}\frac{1}{3}\\-\frac{1}{6}\end{bmatrix} = \begin{bmatrix}?\\?\end{bmatrix}$$

(d)

$$\left(\begin{bmatrix}1 & 0 & 0\\0 & 1 & 0\\0 & 0 & 1\end{bmatrix}\begin{bmatrix}10\\0\\5\end{bmatrix}\right)^T - \begin{bmatrix}2 & -5 & 1\end{bmatrix}\begin{bmatrix}4 & 2 & -5\\2 & 1 & 3\\-5 & 3 & 2\end{bmatrix} = \begin{bmatrix}? & ? & ?\end{bmatrix}$$

Problem 3

Evaluate the function

$$f(x) = \frac{x^2 \cos \pi x}{(x^3+1)(x+2)}$$

for the following cases:

(a)

$x \in [0,\ 1]$ in steps of 0.01

(b)

100 linearly-spaced values of x