6.094 Introduction to MATLAB®
January (IAP) 2009

Homework #1: Variables, Operations, and Plotting

What to turn in: Please turn in a document (preferably Word or PDF) of your work including code and plots. Suppress any intermediate outputs (anything that isn't an answer) with semicolons. Provide final outputs (ans = ...) unless the problem states otherwise.

Exercise 1. Vector initialization

Do Problem 1 and Problem 2 in Chapter 2 on page 125 of Palm. Verify the size and content of the vector for yourself, but don't include the output of the vectors in your writeup.

Exercise 2. Geometric Series

Do Problem 21 in Chapter 2 on page 129 of Palm.

Exercise 3. Syntax

Do Problem 23 in Chapter 2 on page 129-130 of Palm.

Exercise 4. Tension on a Cable

Do Problem 26 in Chapter 2 on page 131-132 of Palm.

Exercise 5. Complex Numbers

Do Problem 1 and Problem 2 in Chapter 3 on page 177 of Palm. You don't need to hand-check the solutions.

Exercise 6. Plotting Functions

1. Plot the function $f(x) = e^{-x} \cos(10x)$ over the interval $0 \leq x \leq 2\pi$.

2. Plot $\sqrt[5]{\cos(x)}$ over the interval $-5 \leq x \leq 5$. You will find the function `nthroot` useful.

3. Plot round$(10 \cos(x))$ over the interval $-4\pi \leq x \leq 4\pi$.

4. Plot the first-order Bessel function of the first kind, $J_1(x)$ from $0 \leq x \leq 10$. Type `help bessel` to guide you.

Exercise 7. Beat Patterns and Plotting Resolution

Do Problem 17 in Chapter 5 on page 343 of Palm.

Exercise 8. Matrix Indexing and Operations

Do Problem 10 in Chapter 2 on page 126 of Palm.

Exercise 9. Solving Problems with Matrices

Do Problem 32 in Chapter 2 on page 134 of Palm. You may find the function `cross` useful.