

Homework 1

Part I

Problems

1. Execute the following in the command window:
 - a. Clear the command window using the `clc` command
 - b. Type: `% NAME HW1, Problem 1` (replace NAME with your actual name). Remember that all text after a `%` are comments that MATLAB ignores.
 - c. Create a vector of the **odd** whole numbers between 15 and 75.
 - d. Create a string (text) using your name and assign it to the variable **Name**
 - e. Screen capture the output (Alt-PrntScrn) and paste it into a Word or other document.

 2. Execute the following in the command window:
 - a. Clear the command window using the `clc` command
 - b. Type: `% NAME HW1, Problem 2` (replace NAME with your actual name).
 - c. Create a variable **y** with multiple rows and columns that has the values
 - d. Add 16 to each element of **y** and assign it to the variable **ra**.
 - e. Compute \sqrt{x} where **x** represents an element of **y** and assign it to the variable **rd**. Your result should be another matrix the same size as **y**.
 - f. Screen capture the outputs (Alt-PrntScrn) and paste it into a Word or other document.

 3. Execute the following in the command window:
 - a. Clear the command window using the `clc` command
 - b. Type: `% NAME HW1, Problem 3` (replace NAME with your actual name).
 - c. Assign evenly space values from 0 to 20 to the variable **x** so that the variable **x** has 101 elements and suppress the output.
 - d. Assign **y** to be the cosine of **x** and suppress the output.
 - e. Plot **y** vs. **x** with a dotted line connecting the data point AND an **x** at each data point. (hint: type “help plot” or “doc plot” in command window to get instructions on using the plot command)
 - f. Position your plot so that the portion of the command window where you did the previous steps is not covered by the plot
 - g. Screen capture the output (Alt-PrntScrn) and paste it into a Word or other document.
- For the above problems, turn in the following:
A single document with a cover page that has your name, class, HW#, date, etc. and all your screen captures on the subsequent pages.

Part II

Create a single MATLAB script with each problem below as a separate section (hint: %%).

1. Create a new script
2. Create a comment section at the top with your name, date, HW#, class, etc.

3. The first script commands should erase all the workspace data, command window output, and close all figures.
4. Create separate sections (%%) for each problem

Problem 1:

1. Calculate the monthly payment (P) for a loan using the following formula:

$$P(N) = \frac{rL(1 + r/12)^{12N}}{12\{(1 + r/12)^{12N} - 1\}}$$

where N is the number of years used to pay back the loan, r is the interest rate, and L is the loan amount. Set r to 15%, L to \$50,000, and vary N from .5 to 20 years. If you enter your formula correctly $P(20) = 658.39$. Make sure to add comments explaining what the formula is doing.

2. Plot the monthly payment vs. the number of years (make sure you have enough data points to make a smooth curve).
3. Use the “text” command to print your name on the plot. Search MATLAB’s help files for information if needed.

Problem 2:

Create another section to do the following. Add a comment at the end of each line detailing what each line does. Make sure command outputs are not suppressed so outputs are published in your final document (as well as to the command window).

- a. Create the matrix

$$A = \begin{bmatrix} 20 & 4 & 2 & 6 \\ 6 & 37 & 2 & 3 \\ 8 & 5 & 9 & 9 \end{bmatrix}$$

- b. assign the first row of A to a vector called x1
- c. assign the last 2 rows of A to an array called y
- d. assign the even-numbered columns of A to an array called B
- e. assign the transpose of A (i.e. turns it into a 4-by-3 array) to C
- f. compute the reciprocal of each element of A
- g. change the number in column 2, row 3 of A to 100.

Turn in the following:

1. A Word (.doc, .docx) document created using the MATLAB publish feature to publish your script.
 2. Your .m script file(s) (these are separate files from the document above). Make sure you use plenty of comments. Before submitting, rename all *.m files to have a .txt extension. For example, rename MyHW6.m to MyHW6.txt before submitting.
- Submit all files electronically on Blackboard. See syllabus for late assignment policy.

Late submissions will receive a 10% deduction!
No submissions will be accepted after one day!