**EGR 182—Introductory Mathematics for Engineering Applications**

**Lab 1: Matlab Introduction**

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**9-4-2020**

Abstract

This lab assignment introduced the software program, Matlab. It focused on how to use Matlab as a calculator, with lots of hands-on examples. It also introduced the concept of using Matlab as a programming language, the use of m-files, and how to plot. **Results show use of vectors, matrices, and vector operations pertaining to multiple practice problems. Also, results show a plotted systems of equation from one practice problem.**

**Introduction**

As stated in the assignment, Matlab is a matrix-based numerical processing tool that is used at most universities around the world and in industry. Engineering students at California Baptist University (CBU) need to use this tool in many of their courses. Thus, this first lab assignment had two objectives: **Our main objective was to become comfortable with the MATLAB environment for use in future labs. Secondary objective was to learn many of the functions and operations that MATLAB has to offer so we are prepared when we do use MATLAB in other labs.**

**Experimental Setup**

The setup was very simple. Students only needed to use the lab computers and the installed Matlab software, along with the examples given in the lab assignment. The lesson used a learn-by-doing approach. A series of examples given in the assignment were typed into the command window, and expected results were also given so as to allow comparison and correction if a mistake was made. Comments were also provided which explained the examples.

**Results and Discussion**

Four exercises were assigned and the Matlab output is attached at the end of this document. The results and discussion are as follows:

1. The given equation was rewritten into Matlab format with result as shown below, in attached pages.
2. Elements of two matrix variables were typed in, and then a matrix multiplication was performed with the resulting output as given below.
3. This exercise was another matrix calculation which used the equation x = inv(A) \* b, with output as shown.
4. **This exercise used systems of equations where you plotted both of them on a graph as shown below**. **Syntax to plot systems of equations includes putting the equations into vectors and to plot them. Commands related to labeling and a title were also used.**

**Conclusion**

A first lesson in using the Matlab software tool/programming-language was introduced.

Many things were straightforward and easy to understand. But some aspects, like the ”dot notation” will require more thinking and practice to fully understand. Programming is also difficult to learn and will require much more practice. Plotting is really a powerful feature, but also can take a lot of time to understand how to make labels and titles. Overall, all of the practice examples and the exercises were successfully completed, and were helpful in providing students with a familiarity of Matlab basics.

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Attached after this page should be the Matlab-printed output (and m-file) related to Exercises 1-4.