**LAB #0 Modeling Dynamics System Using MATLAB and Simulink**

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# INTRODUCTION

The goal of this lab was to calibrate a water tank using a premade Simulink file give. We did this by filling a tank, and then recording the height of water in the tank and the corresponding voltage of the pressure sensor at the bottom of the tank.

# QUESTION 1

Below in Table 1 shows our voltage values to the corresponding water level of the tank.

Table

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| h (cm) | 24.8 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 |
| Vs (V) | 3.397 | 3.355 | 3.27 | 3.194 | 3.100 | 3.038 | 2.946 | 2.873 | 2.794 | 2.703 | 2.601 | 2.534 | 2.447 | 2.351 | 2.266 | 2.175 | 2.099 | 2.015 | 1.932 | 1.832 |

# QUESTION 2

Below is our modified MATLAB code, which contains the values in Table 1.

# QUESTION 3

# CONCLUSION

In conclusion, this lab was a great exercise with showing the power of modeling and plotting with MATLAB and Simulink. There are many useful functions that help with getting straight to the answer with minimum software and syntax problems. Also, the difference shown between the numerical and analytical approaches on the plot was very helpful. Using Euler’s method to generate a numerical solution was very insightful on the power of that technique.