ECE 403 – Pre Lab 1

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*Q1. What is the size of each matrix?*

🡪 7 x 314

🡪 7 x 7

🡪 314 x 1

**🡪** 7 x 1

*Q2. Does the inverse in (E1.3) always exist? Explain why.*

No this inverse does not always exist. This is because there are possible cases that will cause a dimension of to collapse. Specifically, this will happen in cases where the rank of is less than 7.

*Q3. The predictor in (E1.4) predicts one output for one input sample x at a time. However, in this experiment you will have to deal with as many as 78 test samples. How to use a single line of MATLAB code to predict the outputs of all 78-test samples at once without a “for-end” loop?*

This can be done by first creating a matrix where the number of columns corresponds to the number of testing samples and each column is a repeat of the vector w. This matrix can then be used as input to the MATLAB function dot, which will return the dot product of each testing sample with . The MATLAB code that would do this is shown below.

w\_padded = repmat(w, 1,length(Xh\_te)); output = dot(w\_padded, Xh\_te, 1);