**ECE 8527: Introduction to
Machine Learning and Pattern Recognition**

# HW No. 5: Dynamic Progromming

In lecture 11, we introduced a string-matching problem that could be solved by dynamic programming. Replicate that example using word sequences. Your program should read two strings from a file:

myprog file.txt

The text file, file.txt, contains two strings – a reference (first) and a hypothesis (second):

See Jane and Mary run up the hill

Jerry and Mike run quickly to the mill

You should read these strings, convert them to lowercase, and then parse them into a vector of words. Next, you align them using the dynamic programming algorithm we discussed. Your output should look like this:

R: SEE JANE and MARY run UP \*\* the HILL

H: \*\*\* JERRY and MIKE run QUICKLY TO the MILL

Subs: 4 Ins: 1 Dels: 1 Total Errors: 6

Obviously, you should test your code for a lot of different cases and make sure that it works over a wide range of conditions.

You can work in teams of two people to do this since there is a lot of interface software that needs to be written to make this usable. You can work by yourself if you choose. However, about 90% of this code is some low-level string processing software, so you might want some help with that.

If you are looking for some test cases and some examples of how powerful this software can be, please look in this directory:

*https://www.isip.piconepress.com/courses/temple/ece\_8527/resources/string\_matching/*

This type of algorithm is essential to scoring output of pattern recognition systems that operate on sequential data and can output multiple hypotheses per file.