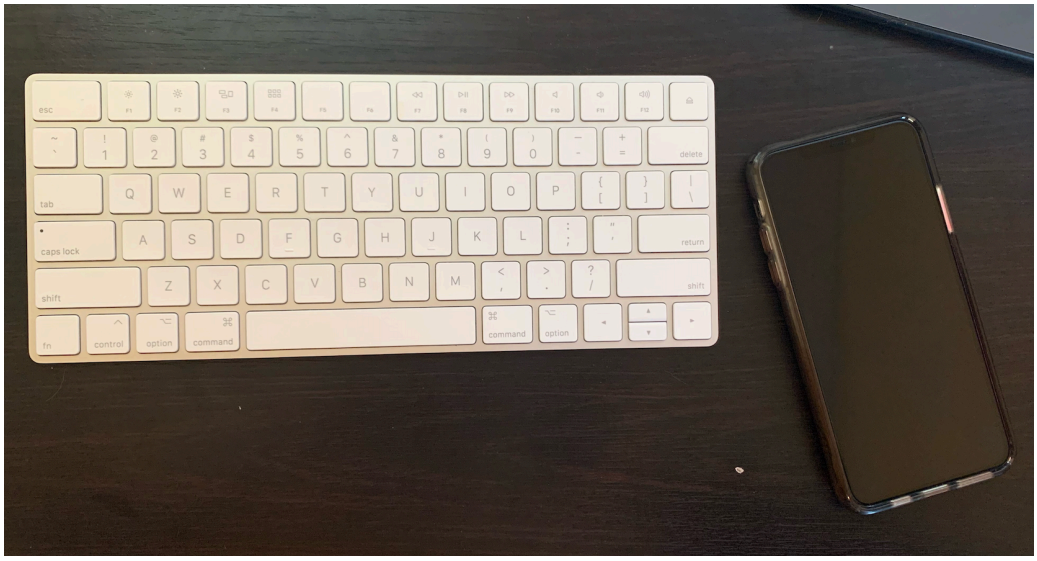
ECE 469/569 --- Mobile and Embedded System Security

Homework 2

Name: _____ Date: _____

**In addition to your codes, please also include a ReadMe doc file to show how to compile/run the code. You can use any programming language. Using built-in MFCC functions (e.g., mfcc() in Matlab/Python) is allowed.*

(Keystroke Snooping via MFCC Features) As shown below, a smartphone is placed nearby a keyboard while a person (victim) is tying on it. Each attached audio file (A.m4a, S.m4a, D.m4a, and Space.m4a) contains 20 recorded keystroke sounds of a particular key (filename).



(1) Please design an algorithm to segment each keystroke, i.e., detecting the starting and ending points of each keystroke. In total, you should have 80 keystroke segments. (30' for ECE-569, and 60' for ECE-469)

(2) Please extract and plot the MFCC features of each keystroke segment. (20' for ECE-569, and 40' for ECE-469)

(3) Keystroke classification ***[Optional for ECE-469 students: bonus points will be provided for completion]*.** Please build a classification model to classify these keystrokes using the extracted MFCC features and report the classification accuracy. For each key, you can use the first 10 keystrokes for training and the rest keystrokes for testing. (*50'*)