MATH447/747 ASSIGNMENT 1

FALL 2012

Due **Friday September 14** in class.

(1) Give a real world example where error detection or error correction is used. State which coding scheme is used in the example and give as many of the parameters which we have discussed in class as you can readily find. You may use Wikipedia but it would be more fun if you go beyond Wikipedia as a source. Cite whatever sources you use.
(2) Vanstone and van Oorschot section 1.5 # 1 (see p4 of the text for the required data)
(3) Let C be an $[n, M]$ code with distance $d = 2t$.
   (a) Prove that C can correct any pattern of $t - 1$ errors in a codeword.
   (b) Prove that when used for error detection only C can detect $2t - 1$ errors.
   (c) Prove that when used for error correction C can simultaneously detect t errors.
   (This is Vanstone and van Oorschot question #7 from 1.5 along with Theorem 1.3; try to do the Theorem 1.3 part without looking)
(4) Vanstone and van Oorschot section 1.5 # 6, 14, 18, 20, 27