MAT 148, Winter 2016
Homework Assignment 4

Due before the start of the class on Wednesday, February 10

Please read the sections 2.3 and 2.5 of the textbook before starting on the problem set.

Written Assignment (see p. 36-37):
24. Prove that the dimension of the Reed-Muller code $R(r, m)$ equals

$$k = 1 + \binom{m}{1} + \ldots + \binom{m}{r}$$

by induction using the identity $\binom{m}{i} + \binom{m}{i+1} = \binom{m+1}{i+1}$.
25. Show that $R(r_1, m) \subset R(r_2, m)$.
26. Compute the dimensions and minimum weights of all the Reed-Muller codes of length 8.
C: Prove that for all k and t there exist n and a linear $[n, k]$ code correcting t errors. *Hint: Use Varshamov-Gilbert Bound.*

The homework must be legible, and written in connected sentences that explains what you are doing. Just the answer (whether correct or not) is not enough. Please put your name and section number on every page and staple the pages together. Homework should be handed in on time, late homework will not be graded.