Homework assignment #1 problems 2.5, 2.6, 2.8 from the book p. 15

and also the following two problems.

$\boxed{A}$ How many $(n,2,n)_3$-codes are there?

How many $(n,2,n)_q$-codes are there?

$\boxed{B}$ What is the smallest possible n for which an $(n,4,3)_2$-code exists? Find such a code of length n. To show that n is as small as possible you must show that no $(m,4,3)_2$-codes exist for all $m < n$.

$\boxed{C}$ A symmetric communication channel for the binary alphabet $\{0,1\}$ with $p(0|0) = p(1|1) = .95$ and $p(0|1) = p(1|0) = .05$.

Now suppose we are transmitting a code word of length 15. What is the probability that the received word has at most a 1-bit error?

Assignment #2

Problems from textbook 3.2, 3.6, 3.11, 3.16(i), 3.20, 3.23 cdef

Exam 1 covers chapters 1, 2, 3 and $\frac{1}{2}$ of Chapter 4.

At the earliest this will be on Monday Feb 6.

Note For two independent probabilities $p(O_1)$ and $p(O_2)$ The probability $p(O_1 \text{ and } O_2) = p(O_1)p(O_2)$

When outcomes O_1 and O_2 mutually exclusive (cannot both occur)

$$p(O_1 \text{ or } O_2) = p(O_1) + p(O_2)$$

probability that a 15-bit string transmitted with 0 errors $= (.95)^{15} = .4632$

probability that a 15-bit string transmitted with one error at bit $j \in \{1, \ldots, 15\}$ $= (.95)^{14}(.05) = .0244$

Probability that a 15-bit string transmitted with at most 1 error $= .4632 + 15(.0244) = .8292 = 82.92\%$