Exam 3
Algebraic Coding Theory
Math 525
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Problem 1: Let u and v be two words in K^{12} such that $\text{wt}(u) = 7$ and $\text{wt}(v) = 8$ What are the possible values for $d(u, v)$? As usual, $K = \{0, 1\}$ and $d(u, v)$ denotes the (Hamming) distance between u and v. Show your work leading to the answer.

Let $u = 111111100000$ and $v = 000011111111$,

We can see here that this is the farthest distance that two words u and v can be in K^{12}. So we get the maximum distance is 9.

Let $u = 111111100000$ and $v = 111111110000$,

We can see here that this is the closest distance that two words u and v can be in K^{12}. So we get the minimum distance is 1.

Because the difference in their weight is 1, every time we make a change in u and v, their distance will change by a factor of 2. This means that the possible values for $d(u, v) = \{1, 3, 5, 7, 9\}$