Binary Linear Constant Weight Codes and Symmetric Differences

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Abstract

A binary linear code C of length n is a subspace of F_2^n. The elements of C are called codewords. For a non-zero codeword c in C, the support of c is the set of positions of the coordinates of c which are non-zero. The Hamming weight of c, denoted by $wt(c)$, is the number of elements of support of c. The minimum weight of C, denoted by $wt(C)$, is $wt(C) = \min\{wt(x) : x \in C \setminus \{0\}\}$. A binary linear code is called constant weight code if every non-zero codeword has the same Hamming weight. In this talk we give a construction for the binary linear constant weight codes by using the symmetric difference of the supports of the codewords. Moreover, we give a characterization for the constant weight codes with given parameters in terms of supports of the codewords. The arguments in this characterization lead us to construct binary linear constant weight codes up to permutation equivalence. Finally, if time permits, we will talk about the permutation automorphism group a constant weight code.

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