On the Coverings of {0,1,2 }^n with Minimal Cardinality

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The paper deals with a Coding Theory problem known as the inverse football pool problem. It is about finding the minimal cardinality T(n) of a covering of Q_n={ 0,1,2} ^n. A covering is here defined as a code A with the following property: for every x in Q_n there exists y in A such that the Hamming distance d(x,y) is equal to n. The first non-trivial value of T(n) is for n=7 as it is not obtained by having an equality in the recurrence relation T(n) >= 3/2 T(n-1). With a proof by exhaustion, compiled on a computer, David Brink has determined that T(7)=29. In our research we gain a better understanding of the very problem by proving the same result by a non-exhaustive method.

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