1022-05-57 **Gyula O.H. Katona** and **Attila Sali*** (sali@renyi.hu), P.O.Box 127, Budapest, 1364, Hungary, and **Klaus-Dieter Schewe**. *Codes that attain minimum distance in all possible directions.*

Let $\mathcal{K}$ be the system of minimal keys in a relational database schema R. Then $\mathcal{K}$ is a Sperner system. Armstrong proved that for each Sperner system of attribute sets there exists an instance such that the given Sperner system is the collection of minimal key sets. However, the constructions use unbounded domains for each attribute. In the present paper we investigate the following problem. Assume that a relational scheme of n attributes is given, where each attribute's domain is of q elements. Furthermore, suppose that the minimal key sets are exactly all the k-element subsets of the set of attributes. Let $f(q,k)$ be the maximum n such that an Armstrong instance with the above properties exists. Considering the records or rows of the Armstrong instance as codewords of length n, the key property means that no two codewords can agree on k or more coordinates, that is the minimum distance is at least $n-k+1$. The minimal key property tells that for any $k-1$-set of coordinates there are two codewords that agree exactly there. We give lower and upper bounds for $f(q,k)$. In particular, we show that $f(q,k)$ is bounded by linear functions of k and q, and determine the exact values for special k and q. (Received September 07, 2006)