On the diameter of the Unidirectional Hyper-Stars

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Star graphs were introduced as a competitive model to the hypercubes. Recently, hyper-stars were introduced to be a competitive model to both hypercubes and star graphs. The vertex set of the hyper-star $HS(n, k)$ is the set of all $\{0, 1\}$-strings of length $n$ with exactly $k$ 1’s, and two vertices are adjacent if and only if one can be obtained by exchanging the first symbol with a different symbol (1 with 0, or 0 with 1) in another position. These graphs have nice connectivity and structural properties, and their edges can be oriented to obtain unidirectional hyper-stars $UHS(n, k)$. In this paper we present computational results on finding the directed path between two vertices in $UHS(n, k)$, and prove an upper bound on its diameter.

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