Abstract

QPlus – software application for research on error-correcting codes

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A new computer package for coding theory research is presented. The system called QPlus offers computations over $Z_q = \{0, 1, \ldots, q-1\}$ ($q < 256$) and includes modular arithmetic, elementary number theory, vectors and matrices arithmetic and an environment for research on q-ary codes - linear, constant-weight and equidistant codes. QPlus includes a DLL library package that implements coding theory algorithms. We explore the problem of finding bounds on the size of q-ary codes by computer methods. Some examples for optimal equidistant codes and constant-weight equidistant codes that have been constructed by computer methods developed in QPlus are described. We also research some optimal linear codes.