Alahmadi, A.; **Aldred, R. E. L.**; **de la Cruz, R.**; **Ok, S.**; **Solé, P.**; **Thomassen, C.**
The minimum number of minimal codewords in an $[n,k]$-code and in graphic codes. (English)
Zbl 1311.05027
Discrete Appl. Math. 184, 32-39 (2015).

Summary: We survey some lower bounds on the function in the title based on matroid theory and address the following problem by *G. Dosa* et al. [PU.M.A., Pure Math. Appl. 15, No. 4, 383–392 (2004; Zbl 1112.05021)]: Determine the smallest number of circuits in a loopless matroid with no parallel elements and with a given size and rank. In the graphic 3-connected case we provide a lower bound which is a product of a linear function of the number of vertices and an exponential function of the average degree. We also prove that, for $p \geq 38$, every 3-connected graph with p vertices has at least as many cycles as the wheel with p vertices.

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MSC:

05B35 Combinatorial aspects of matroids and geometric lattices
94B25 Combinatorial codes

Keywords:

minimal codewords; matroid theory; cycle code of graphs

Software:

Magma; nauty; Traces

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