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Extremal problems on permutations under cyclic equivalence. (In English)

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Let $\sigma \in S_n$ be a permutation and let $[\sigma]$ be the class of all cyclic permutations of σ. For $\pi \in S_n$, $\pi = (b_1, b_2, ..., b_n)$, denote by π^R the permutation $(b_n, ..., b_1) \in S_n$. Also denote by $< \sigma >$ the set $[\sigma] \cup \{\tau^R; \quad \tau \in [\sigma]\}$. In this paper the authors study the function $F(n) = \max \min I(\sigma)$, where $I(\sigma)$ is the number of inversions in σ, the max is over $\pi \in S_n$ and the min over $\sigma \in [\pi]$.
The main result is the following theorem:

$$0.304^- n^2 + 0(n) = \frac{8-\pi}{16} \cdot n^2 - \frac{3n}{2} \le F(n) \le \frac{n^2}{3} - \frac{3n-1}{6} = 0.333^+ n^2 + 0(n).$$

The measures of complexity considered are the number of inversions and the diameter of the permutation.

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