For a permutation $\sigma = (i_1, i_2, \ldots, i_n)$ of $(1, 2, \ldots, n)$ define $D(\sigma) = \sum_{k=1}^{n} |i_k - k|$. Let $Q(n, d)$ be the number of permutations σ of $(1, 2, \ldots, n)$ with $d = D(\sigma)$. Prove that $Q(n, d)$ is even for $d \geq 2n$.