Online Chasing Problems for Regular n-Gons

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We consider a server location problem with only one server to move. Of each request must be served on the exact position, there is no choice for the online player and the problem is trivial. In this paper, we assume that a request is given as a region and that the service can be done anywhere inside the region. Namely, for each request an online algorithm chooses an arbitrary point in the region and moves the server there. Our main result shows that if the region is a regular n-gons, the competitive ratio of the greedy algorithm is $\dfrac{1}{\sin\dfrac{\pi}{2n}}$ for odd n and $\dfrac{1}{\sin\dfrac{n}{n}}$ for even n. Especially for a square region, the greedy algorithm turns out to be optimal.