ABSTRACT. Suppose K is the intersection of a finite number of closed half-spaces in a Hilbert space X. Starting with any point $x \in X$, it is shown that the sequence of iterates $\{x_n\}$ generated by Dykstra's cyclic projections algorithm satisfies the inequality

$$||x_n - P_K(x)|| \leq \rho c^n$$

for all n, where $P_K(x)$ is the nearest point in K to x, ρ is a constant, and $0 \leq c < 1$. In the case where K is the intersection of just two closed half-spaces, a stronger result is established: The sequence of iterates is either finite or satisfies $||x_n - P_K(x)|| \leq c^{n-1}||x - P_K(x)||$ for all n, where c is the cosine of the angle between the two functionals which define the half-spaces. Moreover, the constant c is the best possible. Applications are made to isotone and convex regression, and linear and quadratic programming.