# Problem 10

Give an example of a family of intervals $A_n, n = 1, 2, \ldots$ such that $A_{n+1} \subset A_n$ for all $n$ and $\bigcap_{n=1}^{\infty} A_n$ consists of a single real number. Prove that your example has the stated property.

**PROOF** In order to give an example, I will use the same as the last problem:

$$\left(0, \frac{1}{2^{n+1}}\right) \subseteq \left(0, \frac{1}{2^n}\right)$$

$\frac{1}{2^{n+1}} < \frac{1}{2^n}$, so the subset $\left(0, \frac{1}{2^{n+1}}\right)$ is in the set $\left(0, \frac{1}{2^n}\right)$. So, if there is an arbitrary number $x$ such that $0 < x < \frac{1}{2^{n+1}}$, then $0 < x < \frac{1}{2^n}$.