(10) Use example from problem (9) with a slight modification:

Let $A_n = [0, \frac{1}{n}]$, a closed interval

note that, as before, $A_{n+1} \subset A_n$

And $\lim_{n \to \infty} A_n = [0, 0] = \{0\}$ a single element

Proof: given an arbitrary n,

$A_n = [0, \frac{1}{n}]$ and $A_{n+1} = [0, \frac{1}{n+1}]$

note that $\frac{1}{n+1} < \frac{1}{n}$ so each element of A_{n+1} exists in $A_n \Rightarrow A_{n+1} \subset A_n$

Also, $\lim_{n \to \infty} A_n = [0, 0] = \{0\}$ a single element

And the intersection of any A_n with $[0,0]$ will be the single element $\{0\}$