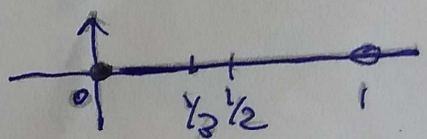
10. Consider the set of intervals defined by

$A_n = [0, 1/n)$

We see that the length of the interval A_{n+1} is always smaller than A_n because (∀n∈ℕ) $\left[\frac{1}{n+1} < \frac{1}{n}\right]$

$\therefore A_{n+1} \subset A_n$

We also see that even though successive intervals get smaller as $n \to \infty$, they all include 0.



$\therefore \bigcap_{n=1}^{\infty} A_n = \{0\}$ → a single element.