QUIZ 3

Problem. Is there a subset of $\mathbb{R}$ with exactly 2016 limit points?

Solution. Yes, we will give an example.

First, recall from lecture that the set
$$E := \{\tfrac{1}{n} : n \in \mathbb{N}\}$$
has exactly one limit point, namely 0. Therefore for any integer k, the set
$$E_k := \{k + \tfrac{1}{n} : n \in \mathbb{N}\}$$
still has one limit point, k.

Our set will be
$$\bigcup_{i=1}^{2016} E_i$$
whose limit points are exactly the set $\{1, 2, \ldots, 2016\}$.