1. Let $X = \{1, 2, 3, 4, 5\}$ and

$$A_1 = \{1, 3\}, \quad A_2 = \{4, 5\}, \quad A_3 = \{2\}.$$

2. Let $X = \mathbb{R}$, $A_n = [n, n+1)$, $(A_n)_{n \in \mathbb{Z}}$.
3. Let $X = \mathbb{Z}$, choose and fix n. Then define $A_0, A_1, \ldots, A_{n-1}$ with

$$A_r = \{x \in \mathbb{Z} : x \equiv r \pmod{n}\}.$$

(We have shown that [2] and [3] are partitions in the past...)