**Definition**

Let $X$ be any set. A collection $\{A_n\}_{n \in I}$ of subsets of $X$ is called a **partition** if

1. $X = \bigcup_{n \in I} A_n$ (exhaustive);
2. For any $m, n$, either

$$A_m = A_n \text{ or } A_m \cap A_n = \emptyset.$$

Basically, if the sets overlap, they must be equal!