Definition

We say that a collection A_n is a **partition** of Ω if

- it is pairwise disjoint: $A_i \cap A_j = \emptyset$ for any $i \neq j$;
- it covers all of Ω:

$$\bigcup_n A_n = \Omega.$$

Theorem

If A_n form a partition of Ω, then for any event E,

$$\mathbb{P}(E) = \sum_{i=1}^{n} \mathbb{P}(E \cap A_i).$$