Definition (Partition). A *partition* of a set $\mathbf{A}$ is a collection $\{\mathbf{A}_i\}_{i \in I}$ of subsets $\mathbf{A}_i \subseteq \mathbf{A}$ such that

1. $\mathbf{A}_i \cap \mathbf{A}_j = \emptyset \quad \forall i \neq j$;
2. $\bigcup_{i \in I} \mathbf{A}_i = \mathbf{A}$.