Indexed Collections of Sets

• The **union** of the $n \geq 2$ sets $A_1, A_2, \ldots A_n$ is denoted by $A_1 \cup A_2 \cup \ldots A_n$ or $\bigcup_{i=1}^{n} A_i$ and is defined as

$$\bigcup_{i=1}^{n} A_i = \{x : x \in A_i \qquad \text{for some } i,\ 1 \leq i \leq n \qquad \}$$

• The **intersection** of the $n \geq 2$ sets $A_1, A_2, \ldots A_n$ is denoted by $A_1 \cap A_2 \cap \ldots A_n$ or $\bigcap_{i=1}^{n} A_i$ and is defined as

$$\bigcap_{i=1}^{n} A_i = \{x : x \in A_i \qquad \text{for some } i,\ 1 \leq i \leq n \qquad \}$$

• An **index set** I is a non-empty set used to describe conviently the union or intersection of a collection of sets that cannot be described conviently.