

**Definition** (Cartesian product of sets). Given two sets **A**, **B**, their *cartesian product* is denoted **A**  $\times$  **B** and defined as

$$\mathbf{A} \times \mathbf{B} = \{\langle x, y \rangle \mid x \in \mathbf{A} \text{ and } y \in \mathbf{B}\}.$$