Example

- Roll a fair six-sided die, let X be the value.
- Define
$$A = \{X = 6\}, \quad B = \{X \text{ is even}\}.$$
- Note that $A \cap B = A$, since $A \subseteq B$. And $\mathbb{P}(A \cap B) = \mathbb{P}(A) = 1/6$.
- Then:
$$\mathbb{P}(A|B) = \frac{\mathbb{P}(A \cap B)}{\mathbb{P}(B)} = \frac{1/6}{1/2} = \frac{1}{3},$$
$$\mathbb{P}(B|A) = \frac{\mathbb{P}(A \cap B)}{\mathbb{P}(A)} = \frac{1/6}{1/6} = 1.$$

Note!!!!!!!!!!!!1one

- Note that $P(A|B) \neq P(B|A)$
- Note also that if $A \subseteq B$ then $\mathbb{P}(B|A) = 1$.