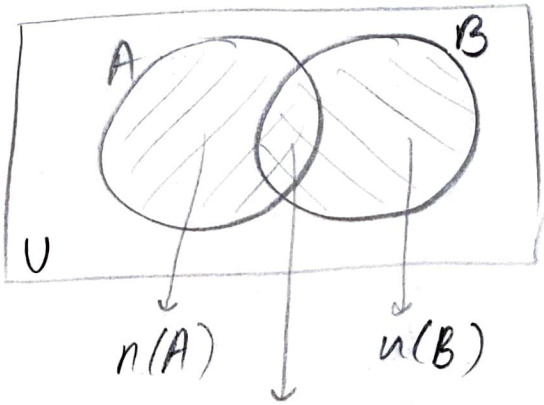
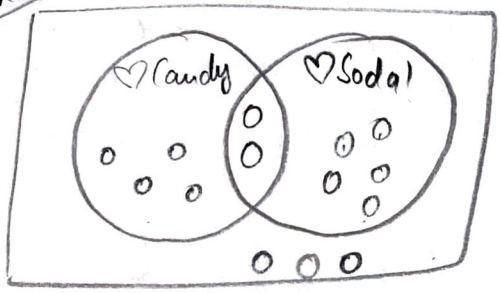
Conditional Probability

$$P(A|B) = \frac{n(A \cap B)}{n(B)} = \frac{n(A \cap B)/n(S)}{n(B)/n(S)} = \frac{P(A \cap B)}{P(S)}$$



Example



In Statland people like to eat candy & soda

	Loves Candy	Doesn't love Candy	
Loves Soda	2	5	Total loves soda = 7
Doesn't love Soda	4	3	
	Total Loves Candy = 4+2=6	8	→ # Doesn't love candy

$P(\text{Loves Candy}) = \frac{6}{14} = \frac{3}{7}$

$P(\text{Loves Soda}) = \frac{7}{14} = \frac{1}{2}$

$P(\text{Loves Candy} | \text{loves Soda}) = \frac{2}{7}$

$P(\text{Love Soda} | \text{Doesn't love candy}) = \frac{5}{8}$