

$$\Omega = \{1, 2, 3, 4, 5, 6\} = \{2, 1, 3, 4, 5, 6\}$$

$$A = \{2, 3, 5\} = \{n \in \Omega : n \text{ is prime}\} = \text{Set of prime \#s in } \Omega.$$

$$B = \{n \in \Omega : 2|n\} = \text{Set of even \#s in } \Omega.$$

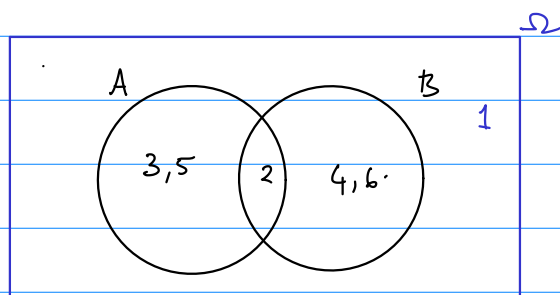
$$\{\{1\}, \{2\}, \{1, 2\}, \{\}\}$$

Subsets. $A \subset B$

$$\{1\} \subset \{1, 2\}.$$

$$\{1, 2\} \subset \{1, 2\}$$

$A \subset B$ if every elt of A is also an element of B .



$$A = \{2, 3, 5\} \quad B = \{2, 4, 6\}.$$

$$A \cup B = \{2, 3, 4, 5, 6\} = \{n \in \Omega : n \text{ is prime} \vee 2|n\}.$$

$$A \cap B = \{2\} = \{n \in \Omega : n \text{ is prime} \wedge 2|n\}$$

$$A^c = \{4, 6, 1\} = \{n \in \Omega : \neg(n \text{ is prime})\}.$$

$$(A \cup B)^c = \{1\} = A^c \cap B^c$$

$$(A \cap B)^c = A^c \cup B^c$$

$$A \times B = \left\{ \begin{pmatrix} 2 \\ 2 \end{pmatrix} \begin{pmatrix} 2 \\ 4 \end{pmatrix} \begin{pmatrix} 2 \\ 6 \end{pmatrix} \right. \\ \left. \begin{pmatrix} 3 \\ 2 \end{pmatrix} \begin{pmatrix} 3 \\ 4 \end{pmatrix} \begin{pmatrix} 3 \\ 6 \end{pmatrix} \right. \\ \left. \begin{pmatrix} 5 \\ 2 \end{pmatrix} \begin{pmatrix} 5 \\ 4 \end{pmatrix} \begin{pmatrix} 5 \\ 6 \end{pmatrix} \right\}.$$

$$\text{Set of all subsets of } \{1, 2\} = \{\{1\}, \{2\}, \{1, 2\}, \{\}\} = 2^{\{1, 2\}} \\ (\text{Power set of } \{1, 2\}).$$

Function $f: D \rightarrow R$.

Indicator function of a set A $\mathbb{1}_A: \Omega \rightarrow \{0, 1\}$.

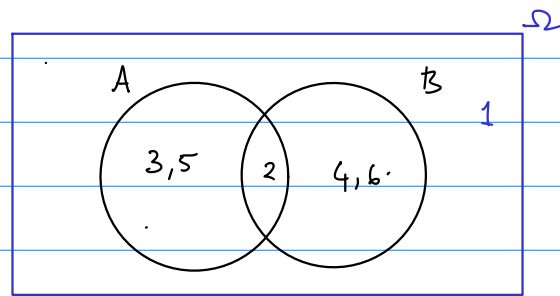
$$\Omega = \{1, 2, \dots, 6\} \quad A = \{2, 3, 5\}.$$

$$\mathbb{1}_A(1) = 0 \quad \mathbb{1}_A(2) = 1 \quad \mathbb{1}_A(3) = 1 \quad \mathbb{1}_A(4) = 0 \quad \mathbb{1}_A(5) = 1 \quad \mathbb{1}_A(6) = 0.$$

$$f: \Omega \rightarrow \mathbb{R}$$

$$g: \Omega \rightarrow \mathbb{R}$$

$$fg$$



$$A = \{ 2, 3, 5 \}$$

$$B = \{ 2, 4, 6 \}$$

$$\mathbb{1}_{A \cap B} = \mathbb{1}_A \mathbb{1}_B$$

$$\mathbb{1}_{A^c} = 1 - \mathbb{1}_A$$