Comp0147: Discrete Math for Comp. Scientists

Foundations:	Core Concept:
- Sets theoric notation	- Linear Algebra
- Functions, Permutations	- Counting
- Euclid's algorithm	

Set Notations:

- $A = \{a, b, c\}$, $d \in A$: d is element that sits inside "bag" A (element: pointer)
- Empty set ϕ: bag with NO elements
- Set $A = B$
  - Need to prove:
    a) $A \subseteq B$: A subset of B
    b) $B \subseteq A$: B subset of A

Set Operations

- Union: $A \cup B = \{x \mid (x \in A) \vee (x \in B)\}$

- Intersection: $A \cap B = \{x \mid (x \in A) \wedge (x \in B)\}$

Cartesian product:

$$A \times B = \{(x, y) \mid (x \in A) \wedge (y \in B)\}$$

- Difference: $A \setminus B = \{x \mid (x \in A) \wedge (x \notin B)\}$

Symmetric difference:

$$A \Delta B = (A \setminus B) \cup (B \setminus A) = (A \cup B) \setminus (A \cap B)$$

Complement of set A:

$$A^C = U \setminus A = \{x \mid (x \in U) \wedge (x \notin A)\}$$

For Laws check pC