Discrete Mathematics

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Proposition

- A proposition is a declarative sentence (that is, a sentence that declares a fact) that is either true or false, but not both
- The negation of p, denoted by ¬p
- The conjunction of p and q, denoted by $p \wedge q$
- Truth table
- The disjunction of p and q, denoted by $p \vee q$

- The conditional statement $p \rightarrow q$
- The biconditional statement $p \leftrightarrow q$

Logic circuits

- AND
- OR
- NOT
- NAND
- NOR
- XOR
- XNOR

Tautology

- Tautology
- Contradiction

De Morgan’s theorem

Quantifiers

- Universal quantifier $\forall$
- Existential quantifier $\exists$

Set

- Subset
- Superset
- Powerset

Matrix

- Inverse
- Transpose
- Identity matrix

Algorithm

- Search
- Finding maximum
- Binary search
- Sort
- Big O notation

Modular arithmetic

Probability

- Complement of an event
- Union of event
- Conditional probability
- Bayesian theorem

Graphs

- Tree
- DAG
- Adjacency matrix
- Adjacency list

Regular expression

- Union
- Concatenation
- Klene