

Mathematics for Computer Science

Week 1 Notes

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Reading

Chpater 1: Sections 1 - 3

Definitions

Proposition: A proposition is a statement (communication) that is either true or false, but not both.

Predicate: a predicate can be understood as a proposition whose truth depends on the value of one more or more variables.

Axioms: a statement or proposition which is regarded as being established, accepted, or self-evidently true.

Proofs: A proof is a sequence of logical deductions from axioms and previously proved statemtns that concludes with the proposition in question.

Theorem: A theorem is a proposition that has been or needs to be proved on the basis of previously established statements,

Lemmas: A lemma is a proposition that is proved for use in the proof of another proposition.

Corollary: A corollary is a proposition that follows in just a few logical steps from a theorem.

Math Symbols

- $::=$: means “equals by definition”. It’s always ok to write $=$ instead of $::=$.
- \forall : is read “for all” or “for every”.
- \mathbb{N} : is the set of natural numbers: $\{0, 1, 2, 3, \dots\}$.
- \in : means “is an element of” or “belongs to” or simply as “is in”.
- \mathbb{Z}^+ : is the set of positive integers: $\{1, 2, 3, \dots\}$.
- $P(n)$: is a predicate with variable n . “note: $P(n)$ is not a proposition nor a function.”