

DISCRETE MATHEMATICS

Discrete mathematics is the branch of mathematics dealing with objects that can consider only distinct, separated values.

It is the study of mathematical structures that are *countable* or otherwise *distinct* and *separable*.

Examples of structures that are discrete are **combinations, graphs, and logical statements**. Discrete structures can be finite or infinite.

LOGIC

The rules of logic give precise meaning to mathematical statements distinguishing between valid and invalid arguments.

Logic is the study of correct reasoning. Logic's focus is the *relationship between statements*, and not the content of statements.

The rules of mathematical logic specify methods of reasoning mathematical statements.

Greek philosopher, **Aristotle**, was the pioneer of logical reasoning.

Logical reasoning provides the theoretical base for many areas of mathematics and consequently computer science. It has many practical applications in computer science like design of computing machines, artificial intelligence, definition of data structures for programming languages etc.

Propositions are the building blocks of logic. It is a statement that is either true or *false*.

Propositions are represented by lower case letters $p, q, r, t, s, \dots$ known as **propositional variables**.

Truth values are represented by **T** for **true** and **F** for **false**.

Propositional Logic or Propositional Calculus is the area of logic that deals with propositions.

Propositional Logic is concerned with statements to which the truth values, "true" and "false", can be assigned. The purpose is to analyze these statements either individually or in a composite manner.

PROPOSITION

Readings On Logic

Katrin Zwirgmaier



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