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Discrete Math Notes

**Discrete Math Uses**

Basic of discrete mathematics

* Definition of discrete math: the math that falls outside the realm of calculus. Calculus is the study of continuous math concepts, whereas this topic is discrete: the study of separable, countable, or quantified objects
* Core concepts
  + Logic: identify predicates, format conditional statements (including adding quantifiers), logical operations (e.g. AND, OR)
  + Set theory
  + Number theory
  + Graph theory
  + Combinatorics

Discrete Math for Programming

* Computers operate in a discrete manner.
  + Machine language is a series of binary bits and bytes.
  + A bit has a value of zero or one.
  + Boolean operators are either true or false.
  + Logical expressions evaluate to true or false.
* Logical expressions are often used in conditional statements
* Discrete mathematics helps with programming efficiency
  + Evaluates algorithms to determine run time. (e.g. sorting algorithms)

Real-world Discrete Math

* Logic reasoning used in real-life.
  + Proof by contradiction
  + Indirect proof
  + Use laws of logic (e.g. state machine)

Abstract Math

* Justifies the use of math in applications.
* Requires conceptual reasoning about

**Above section not finished**