Lecture 3

Set operations

      union
      intersection
      difference
      complement
      cartesian product
      power set 2^S set of all subsets of S

union and intersection are commutative, associative and distributive
Venn diagrams
Be careful if you allow sets to be elements of sets
DeMorgan's Law $S \bar{\cap} T = \bar{S} \cup \bar{T}$
generalization of DeMorgan's law

functions

      one-to-one
      onto

Infinite sets are same cardinality if one-to-one onto function $A \to B$
One-to-one each way implies one-to-one, onto function
One can list elements of a set iff the set is countable
countable sets

      rationals are countable
      finite length strings
      computer programs

Set of functions not countable
diagonalization