Class 21: Review

Exam 2

Exam 2 will be in class on Thursday, 9 Nov. Make sure to go over the notes about the exam posted in Class 20.

Main Topics for Review

Today we review the topics that we learned after Exam 1 with the exception of number theory (which will not be included in Exam 2).

– State Machines and how to argue about correctness of programs.

– Recursive Definitions and how to prove statements about them using structural induction.

– Infinite Sets and Cardinalities, and how to show sets are finite, infinite, countable, or uncountable.

State Machines

$M = (S, G \subset S \times S, q_0 \in S)$ defines a state machine.

P is a *preserved invariant* if:

$$\forall q \in S.(P(q) \land (q \to r) \in G) \implies P(r)$$

Invariant Principle: If P is a *preserved invariant* and $P(q_0)$ is true, then property P is true for all **reachable states**.