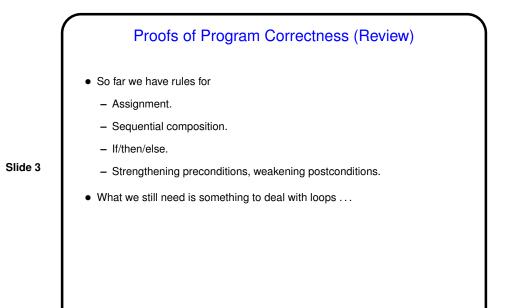
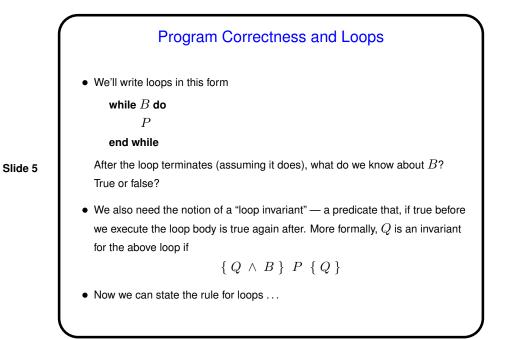
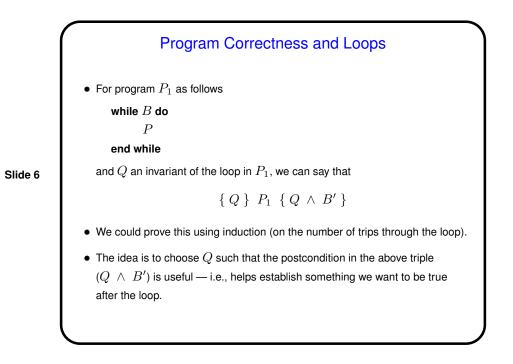


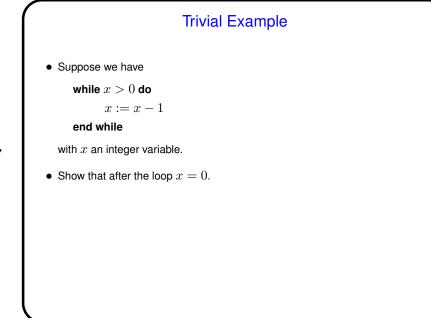
Specifications and Correctness (Review) • If we have a program P, and a specification consisting of precondition Q and postcondition R, we write $\{Q\} P \{R\}$ to mean that if we start in a state where Q is true and run P, we end in a state where R is true. (Also, P terminates — no "infinite" loops.) • Example: $\{x \ge 0\} \ y := sqrt(x); \ \{y \ge 0 \land y^2 = x\}$



Suppose you have a jar containing white marbles and black marbles, plus an unlimited supply of extra black marbles, and you do the following: Select two marbles. If they're the same color, discard them both and put a black marble in the jar. If they're different colors, discard the black one and put the white one back in the jar. If there are at least two marbles in the jar, repeat. Does this end? If it does, what if anything can you say about the marble(s) in the jar when it ends? (Similar ideas behind "metric" for loop termination and "invariant" for loop correctness.)







Slide 7

