CSCI 350 Spring 2005

QUIZ 3

Assigned Thursday, 05-01-25

One of the following two techniques applies to proving the correctness of recursive algorithms, the other one to proving the correctness of iterative algorithm. Match the techniques to the class of algorithms.

1. Use induction to show correct fulfillment of postcondition in
   (a) basis case(s)
   (b) case where input is of size n+1, assuming (inductive assumption) that the postcondition is fulfilled when input is of size n (simple induction) or input is of all sizes from 0 to n (strong or complete induction).
2. Determine an appropriate invariant.
   (a) Show that the invariant is true when entering the loop for the first time.
   (b) Show that, if the invariant is true and the loop condition is false, the postcondition is fulfilled.
   (c) Show, by induction, that, if invariant is true for input of size n and the loop condition is false, the invariant is also true for input of size n+1.

Answer: The first techniques is for recursive algorithms, the second technique for iterative ones.