

Grading for Question #1:

Note: The *temp* variable is not strictly necessary. We could instead use *root* to traverse the tree. Since it's just a local copy of the original *root* pointer at the start of the function, modifying it has no adverse impact here.

Note: We cannot check whether *temp* == *NULL* in the while loop, since it's gated by the condition that *temp* != *NULL*.

- +1 pt for creating a result variable of some sort.
- +1 pt for initializing the result variable to 1. (Initializing to 0 would wipe out results of multiplication. If they found a way around that, though, award this point.)
- +1 pt for looping condition. They might instead use *while(1)* and then check whether *temp* == *NULL* inside the loop, returning *result* if so. That alternative approach is fine. If they forget to declare *temp* or initialize *temp* to *root*, or if the data type is wrong for that variable, do not award this 1 pt.
- +2 pts for moving pointer left and right as appropriate in all cases.
- +2 pts for multiplying result variable by appropriate integer in all cases.
- +2 for overall structure and general correctness of solution (i.e., a while loop with if statements that multiply the return value by some integer and move a pointer left or right). Note that if they use a temp variable, they must be careful to actually use that in their *if* conditions (rather than *root*), as well as their assignment statements (e.g., *temp* = *temp*->*right*, not *temp* = *root*->*right*). Note also that they **must** use *else* statements to prevent multiple *if* statements from triggering. The recursive version uses *return* statements to prevent that, but in an iterative version, we can't just slap an *else* statement on the last condition. Otherwise, we could check multiple conditions and possibly encounter a segmentation fault.
- +1 for finding a way to terminate when *root*->*left* and *root*->*right* are both *NULL*. This could involve a return statement within the loop, or they could set their pointer to *NULL*.