Exercise 3.3.7

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Claim: all nodes reachable from u will be marked as visited.

Proof. By induction, on distance form u. (for every node v, which is i reachable from u, there is some path from u to v).
Let k_v be teh distance from u to v.
Base case: k_V=0. (can get to v in zero steps, so v must equal u). So v=u. Thus u is marked as visited.
IH: suppose all nodes distance d from u will marked. Show nodes d+1 distance from u get marked. These nodes get explored when their neighbors, which are distance d from u get explored. So the nodes at distance d+1 from u get visited. ■