Interview Questions: Undirected Graphs

3/3 points earned (100%)

Excellent!

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1.
Nonrecursive depth-first search. Implement depth-first search in an undirected graph without using recursion.

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Thank you for your response.

Hint 1: use an explicit stack.

Hint 2: it is trickier than it may appear at first; you can simply replace a queue with a stack in breadth-first search.

1 / 1 points

2.

Diameter and center of a tree. Given a connected graph with no cycles

- *Diameter*: design a linear-time algorithm to find the longest simple path in the graph.
- *Center*: design a linear-time algorithm to find a vertex such that its maximum distance from any other vertex is minimized.

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Thank you for your response.

Hint (diameter): to compute the diameter, pick a vertex s; run BFS from s; then run BFS again from the vertex that is furthest from s.

Hint (center): consider vertices on the longest path.

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1 / 1 points

3.

Euler cycle. An Euler cycle in a graph is a cycle (not necessarily simple) that uses every edge in the graph exactly one.

- Show that a connected graph has an Euler cycle if and only if every vertex has even degree.
- Design a linear-time algorithm to determine whether a graph has an Euler cycle, and if so, find one.

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Thank you for your response.

Hint: use depth-first search and piece together the cycles you discover.