BREADTH-FIRST SEARCH (BFS)

BFS (VERTEX V)
  { V.MARKED = TRUE
  INITIALIZES QUEUE Q WITH V
  WHILE (Q IS NOT EMPTY)
  { W = DELETE FROM QUEUE Q
    FOR EACH U ADJOIN TO W DO
      IF (!U.MARKED)
      { ADD U TO QUEUE Q
        U.MARKED = TRUE
      }
  }
  }

BF TRAVERSAL
  { FOR EVERY V IN G DO
    V.MARKED = FALSE
    FOR EVERY U IN G DO
      IF (!V.MARKED) BFS(V)
  }

Time complexity \(O(n+m)\)

- \(n\): VERTICES
- \(m\): EDGES

Space complexity \(\Theta(n)\)

EXAMPLE

BFZ

GIVEN A MAZE FIND BFS
A PATH

USE DFS OR BFS
"FIND SHORTEST PATH!"

BFS USED IN OTHER APPLICATIONS
- e.g. FIND RADIUS OF GRAPHS