



1. Breadth First Search: Shortest Reach

ALL



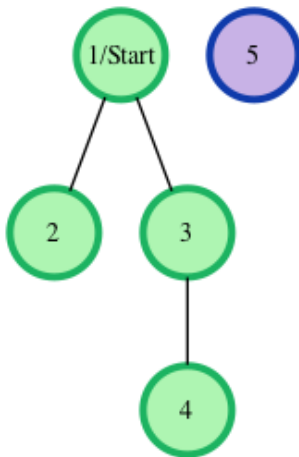
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Consider an undirected graph where each edge weighs 6 units. Each of the nodes is labeled consecutively from 1 to n .

You will be given a number of queries. For each query, you will be given a list of edges describing an undirected graph. After you create a representation of the graph, you must determine and report the shortest distance to each of the other nodes from a given starting position using the *breadth-first search* algorithm ([BFS](#)). Return an array of distances from the start node in node number order. If a node is unreachable, return -1 for that node.

Example

The following graph is based on the listed inputs:



$n = 5$ // number of nodes

$m = 3$ // number of edges

$edges = [1, 2], [1, 3], [3, 4]$

$s = 1$ // starting node

All distances are from the start node 1. Outputs are calculated for distances to nodes 2 through 5: $[6, 6, 12, -1]$. Each edge is 6 units, and the unreachable node 5 has the required return distance of -1 .

Function Description

Complete the `bfs` function in the editor below. If a node is unreachable, its distance is -1 .

`bfs` has the following parameter(s):

- `int n`: the number of nodes
- `int m`: the number of edges
- `int edges[m][2]`: start and end nodes for edges
- `int s`: the node to start traversals from

Returns

`int[n-1]`: the distances to nodes in increasing node number order, not including the start node (-1 if a node is not reachable)

Input Format

The first line contains an integer q , the number of queries. Each of the following q sets of lines has the following format: