

1. Graph,

Build a directional graph and find a path. For example, we have vertex $[1,2,3,4,5]$ and the edges are $[1,2], [2,3], [3,4], [4,5], [5,1]$

Note $[1,2]$ means node 1 points to node 2. $[2,1]$ means node 2 points node 1. If you start from one of the node and try to go through all the other nodes, for example, you start from node 1, and can find edges like $[1,2], [2,3], [3,4], [4,5], [5,1]$, then we can say that there is a path for this graph.

One more example, given an graph with vertex $[1,2,3]$ and the edges are $[1,2], [2,3], [3,2]$. There is no path for this graph.

Please build an graph and test the input below.

(1) Vertex $[1,2,3,4,5]$

Edges: $[1,2], [2,3], [3,1], [3,5], [4,5], [3,4], [5,1]$

(2) Vertex $[1,2,3,4]$

Edges: $[1,3], [2,4], [4,1], [4,3]$

2. Tree

Design a method to return the height difference between the left subtree and the right subtree.

Note you need to think about what should be the input, what should be the return value. Test the tree below,

