

**Exercise – BFS**

Compute the distances of all vertices from a given starting vertex using BFS.

**Input** The first line of the input contains the number  $t \leq 10$  of test cases. Each of the  $t$  test cases is described as follows.

- It starts with a line that contains three integers  $n \ m \ v$ , separated by a space, denoting the number of vertices, the number of edges, and the starting vertex, and such that  $0 \leq n \leq 10^3$ ,  $0 \leq m \leq \binom{n}{2}$ , and  $0 \leq v \leq n - 1$ .
- The following  $m$  lines each contain two integers  $a \ b$ , separated by a space, indicating that  $\{a, b\}$  is an edge of the graph.

**Output** For each test case you should output one line containing the distance of the vertices from  $v$ , ordered by increasing labels. If a vertex cannot be reached, its distance is  $-1$ .

**Points** There is one group of test sets, worth 100 points in total.

**Sample Input**

```
2
5 4 0
0 1
0 2
2 3
2 4
4 1 2
2 3
```

**Sample Output**

```
0 1 1 2 2
-1 -1 0 1
```