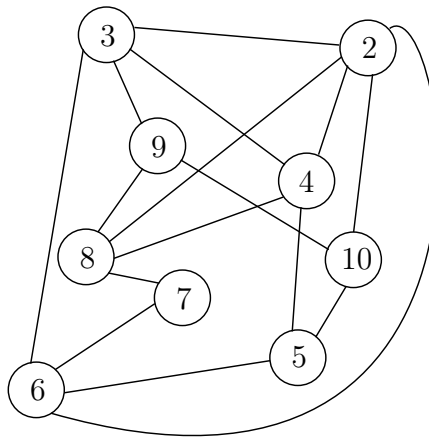# TRAVERSAL ALGORITHMS

Algorithms Analysis

github.com/erngv

1. Let G be the **undirected** graph of integers from 2 to 10 where there is an undirected edge between i and j if (i divides j evenly and $i < j$) or if $j = i+1$. Show the result of performing breadth-first search on this graph starting at the vertex 2. Show $d[v]$ and $\pi[v]$ for all vertices v in G when BFS is done.

vertex	d[v]	$\pi[v]$
2	0	NIL
3	1	2
4	1	2
5	2	4
6	1	2
7	2	6
8	1	2
9	2	3
10	1	2

2. Let G be the **directed** graph of integers from 2 to 10 where there is a directed edge from i to j if (i divides j evenly and $i < j$) or if $j = i + 1$. Show the result of performing depth-first search on this graph starting at the vertex 2. Show $d[v]$, $f[v]$, and $\pi[v]$ for all vertices v in G when DFS is done. Assume that when the vertices $v \in Adj[u]$ are examined in line 4 of DFS-visit, they are examined in numerical order, so that if u is the number 2 then its neighbors v are examined in the order $3, 4, 6, 8, 10$ and so on.

vertex	d[v]	f[v]	$\pi[v]$
2	1	18	NIL
3	2	17	2
4	3	16	3
5	4	15	4
6	5	14	5
7	6	13	6
8	7	12	7
9	8	11	8
10	9	10	9