

SOLUTION 1

Exercise Session: 2.5.2024

Question 2

BFS: 1 – 5 – 6 – 2 – 4 – 7 – 8 – 3 – 9

DFS: 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9

Question 3

- a) You can find an exemplary implementation in the jupyter notebook `traversal.ipynb`.
- b) See a).
- c) Both DFS and BFS have runtime complexity $\mathcal{O}(|V| + |E|)$. With both DFS and BFS the total of number of taken “steps”, i.e. analyzed entities equals $v_1 + E(v_1) + v_2 + E(v_2) + \dots + v_n + E(v_n) = (v_1 + \dots + v_n) + (E(v_1) + \dots + E(v_n))$, where v_i are the nodes of the given graph and $E(v_i)$ denotes the set of incident edges of node v_i . The first part of the sum is in $\mathcal{O}(|V|)$ and the second one in $\mathcal{O}(2|E|) = \mathcal{O}(|E|)$.