Foundation of Computer Science — FM2

Assignment 1a on all videos from the course *Algorithmic Thinking, Part 1*
(see modules 1 and 2)
from *What is Algorithmic Thinking* to *Number of steps of brute force distance*
and from *Orders of growth* to *BFS-based distance distribution*

... it is a lot, but it's quite easy :)

1. Which of the following choices is the tightest upper bound for the functions

   (a) $f(n) = \frac{1}{2}n(n+1)$,

   (b) $f(n) = \frac{1}{2^n}$,

   (c) $f(n) = \frac{n^2}{1+n}$,

   $O(n)$, $O(n^3)$, $O(1)$ or $O(n^2)$?

2. Is $f(n) = n \log n$ of order $O(n^2)$? Is $f(n)$ also $\Omega(n^2)$?

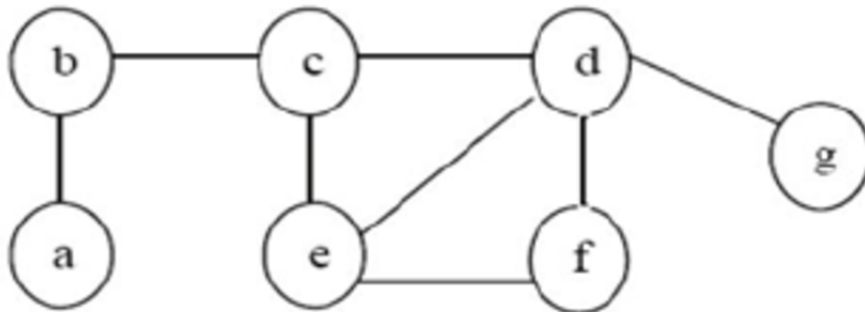3. Demonstrate the BFS algorithm by computing the distances of all nodes to node a.

Figure 1: Graph von G