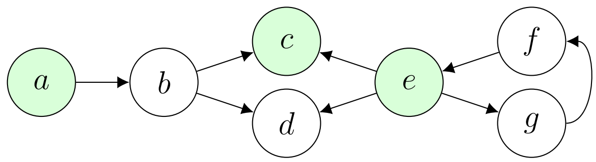
I Can See You

This is a **regular task**. You must submit a PDF, which can be produced using the LaTeX template on Moodle, exported from a word processor, hand-written or any other method.

You are given a directed graph $G(V, E)$ where each vertex $v \in V$ has a positive weight, denoted $w(v)$. A set $S \subseteq V$ is said to be all-seeing if each vertex of the graph is reachable from at least one member of S. The weight of a subset S is the total weight of all its vertices. Consider the graph pictured below, with weights not shown.



We can verify that $\{a, c, e\}$ is all-seeing. However, $\{a, c\}$ is *not* all-seeing, as vertices e, f and g are not reachable from either a or c.

vertex	a	b	c	d	e	f	g
reachable from	a	a	a, c, e	a, e	e	e	e

Design and analyse an efficient algorithm that finds the minimum weight all-seeing subset.

Advice.

- There are two key components to the proof. Both are implied in the problem statement, and the definition of an all-seeing set.

Expected length: Up to two-thirds of a page.