Shortest path problem

Input: Directed graph $G = (V, E)$

start vertex s

"lengths" $l_e \geq 0 \quad \forall e \in E$

↑ integers

Output: A shortest s-t path P $\quad \forall t \in V$

↑ w.r.t. the length of P

$$l(P) = \sum_{e \in P} l_e$$

Simpler Version: Output $d(t) \quad \forall t \in V$

$d(t)$: distance of t from s

↑ in terms of length

$\Rightarrow$ length of the shortest s-t path

Special Case: $l_e = 1 \quad \forall e \in E \equiv$ HW3 Q3

Q: $l_e = L$ (for some $L \geq 1$)

e.g. $L = 100$

$l_e = 100 \quad \forall e \in E$

A: Reduce this case to HW3 Q3

How: Ignore L, assume $l_e = 1 \quad \forall e \in E$