

Q:

Pseudo Code :

$$L[i, s] = 0 \quad \forall i$$

$$L[0, v] = \infty \quad \forall v \in V - s$$

for ( $i = 1$  to  $n-1$ )  $\leftarrow$  max # edges required is  $n-1$  if no neg. cycles (see quiz)

for ( $v \in V - s$ )

$$L[i, v] = \min \left\{ \underbrace{L[i-1, v]}, \underbrace{\min_{(w,v) \in E} L[i-1, w] + l(w,v)} \right\}$$

• Assume have inverse adjacency list

$$A_G^i[v] = \{u : (u, v) \in E\}$$

• Do for loop over  $A_G^i[w]$

Q: What is runtime of Bellman Ford? (Pick strongest bound)

A)  $O(n^2)$

B)  $O(mn)$

C)  $O(n^3)$

D)  $O(m^2)$

$$\sum_{i=1}^{n-1} \sum_v \left( 1 + \sum_{(w,v) \in E} 1 \right)$$

$$n(n + m) = O(nm)$$

( $n < m$  if  $G$  is connected)