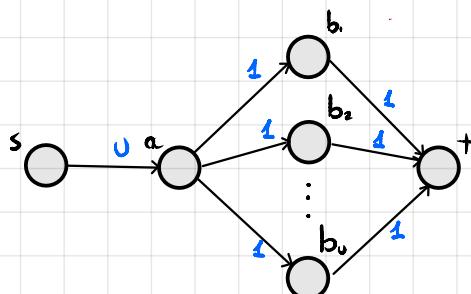


# • LEONARDO SERULLI

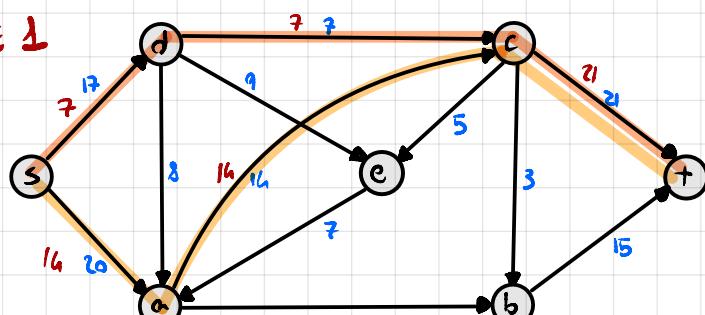
## QUESTION 1

- Eseguiamo un NODE-SPLITTING, per ogni nodo del grafo, ponendo la capacità a 1 su ogni arco incidente dallo splitting;
- Utilizziamo l'algoritmo F&F sul grafo ottenuto

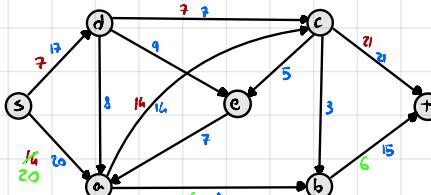
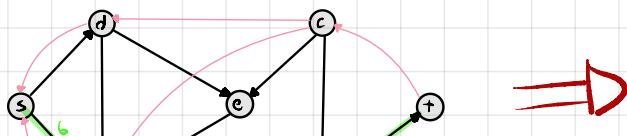
## QUESTION 2



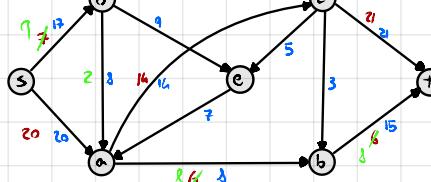
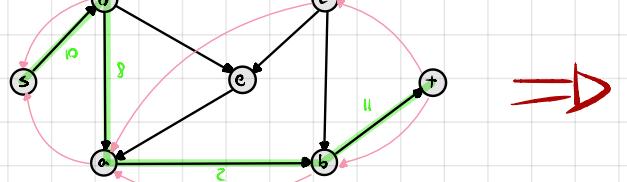
## EXERCISE 1



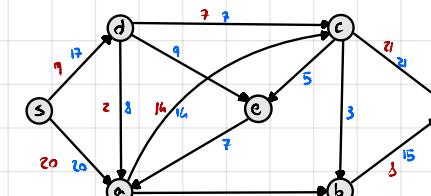
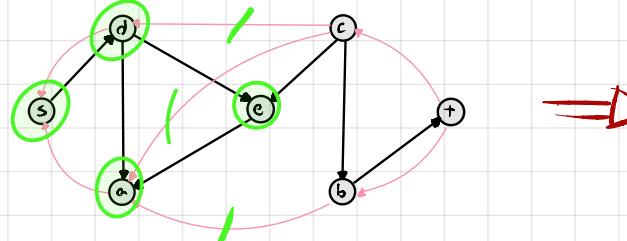
STEP 1:



STEP 2:



STEP 3:



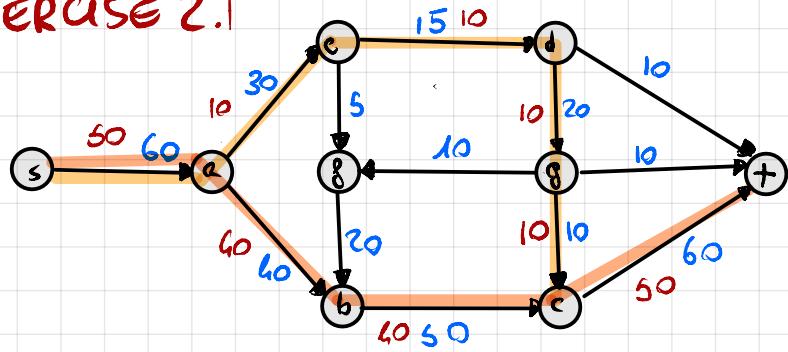
- Allo STEP 3 siamo costretti a fermarci poiché gli archi di tipo 'REVERSE' hanno  $\text{flow} = \phi$  perciò non possono far parte di un AUGMENTING PATH.

$$R = \{s, a, d, c\}$$

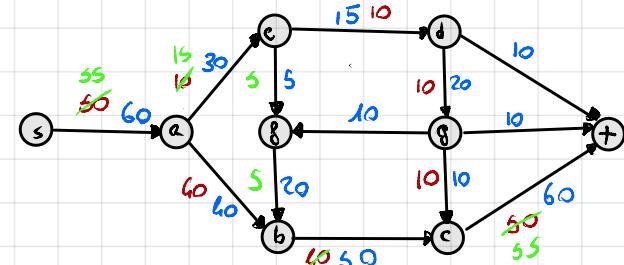
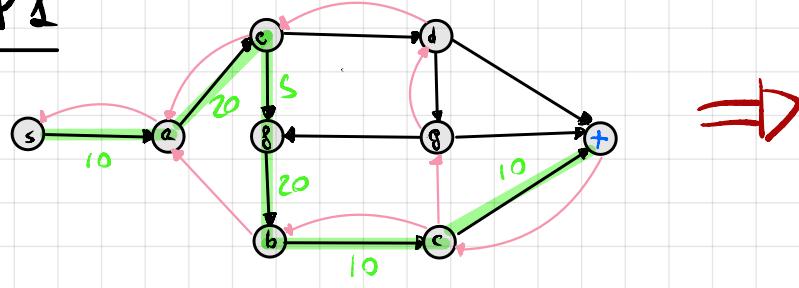
$$S(R) = \{(d, c), (a, c), (a, b)\}$$

$$\delta_x(s) = 9 + 20 = 11 \quad (\delta_x(R) = 7 + 8 + 14 = 29)$$

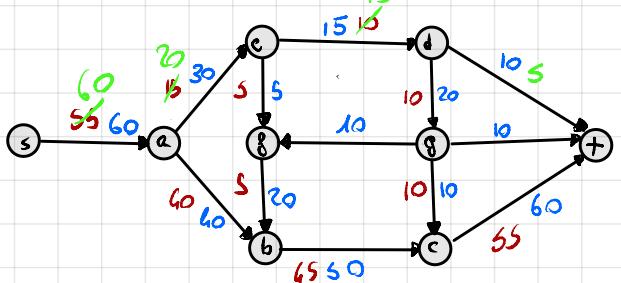
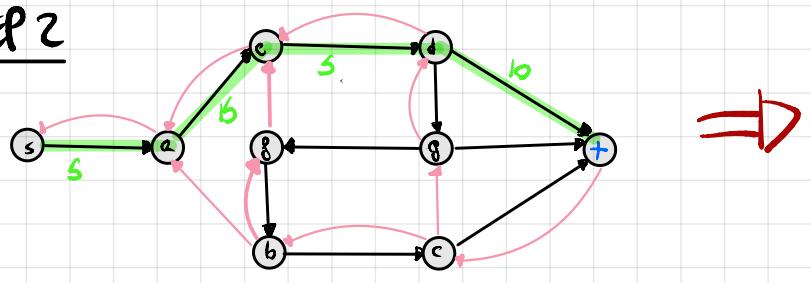
## EXERCISE 2.1



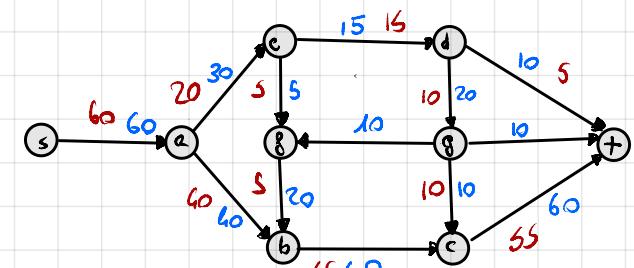
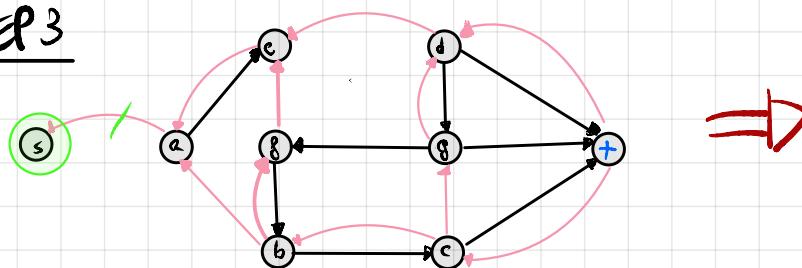
STEP 1



STEP 2



STEP 3

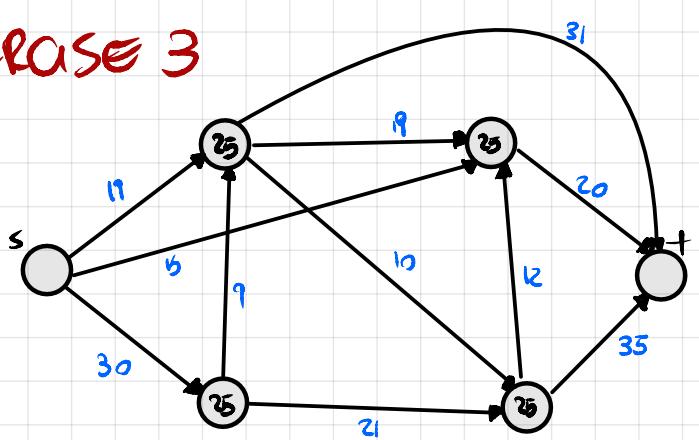


- $R = \{s\}$
  - $S(R) = \{(s,a)\}$
- $\Rightarrow f_x(s) = 60 = \mu(S(R)) = 60$

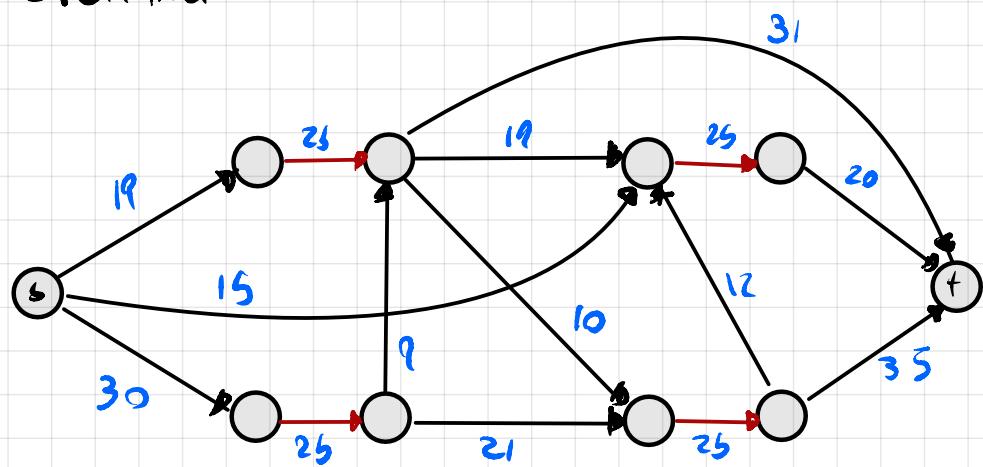
## EXERCISE 2.2

- ANCHE AUMENTANDO LA CAPACITÀ DI UN SOLO ARCO LA SITUAZIONE NON CAMBIEREBBE;
- ANDREBBERO AUMENTATE SIA  $u_{sa}$  CHE  $u_{cd}$  AD ESEMPIO

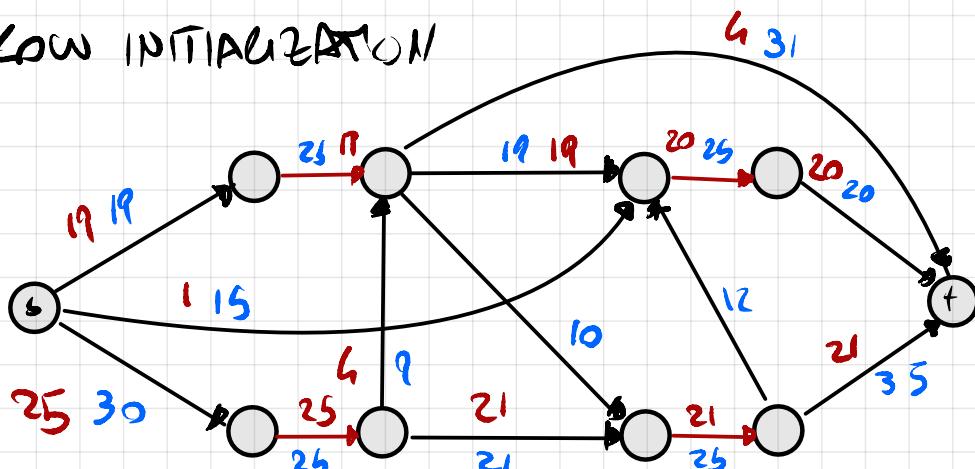
# EXERCISE 3



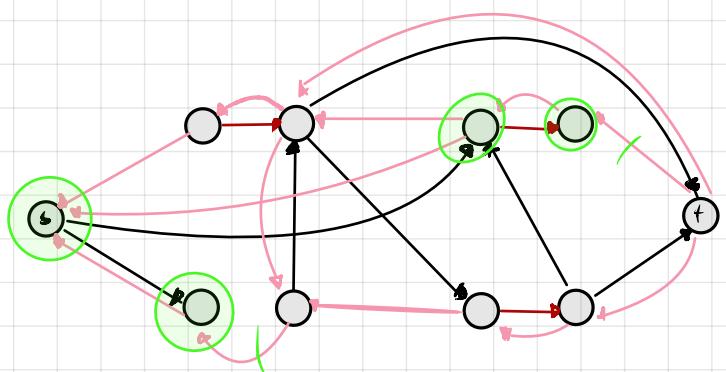
## • SPANNING



## • FLOW INITIALIZATION



## • F&F



$$\begin{aligned} \cdot \lambda(\delta(R)) &= 20 + 25 = 45 \\ \cdot \delta_x(s) &= 19 + 1 + 25 = 45 \end{aligned}$$

$$\rightarrow \delta_x(s) = \lambda(\delta(R))$$