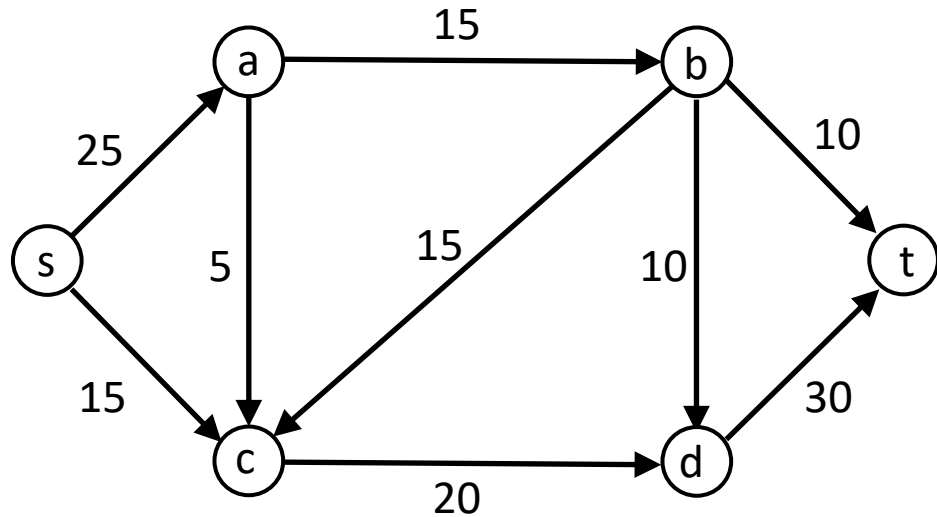
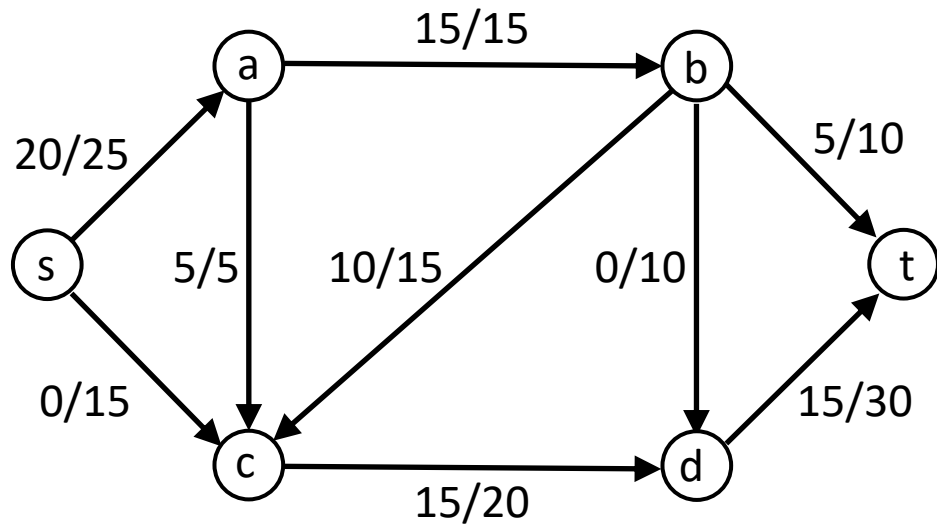


# Quick review

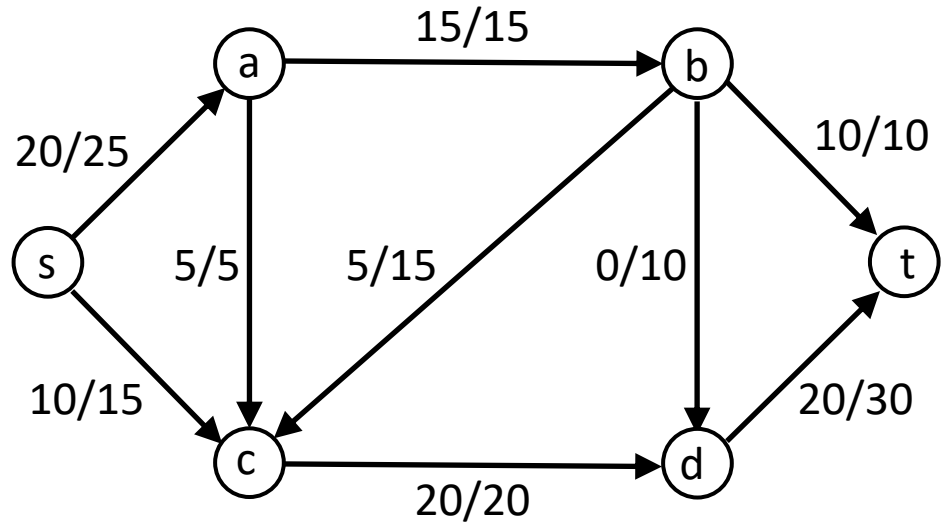
A flow network  $\mathcal{F}$



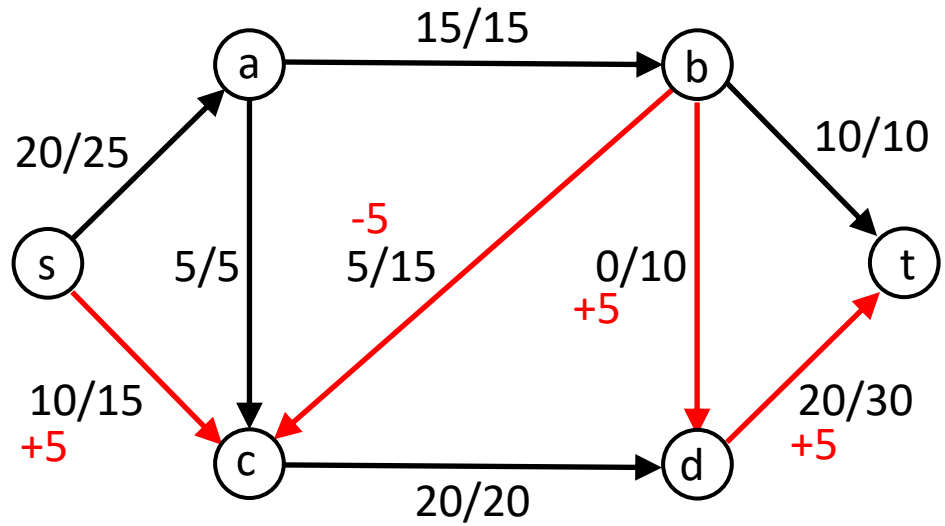
A flow  $f$  in  
the network  $\mathcal{F}$   
 $V(f) = 20$



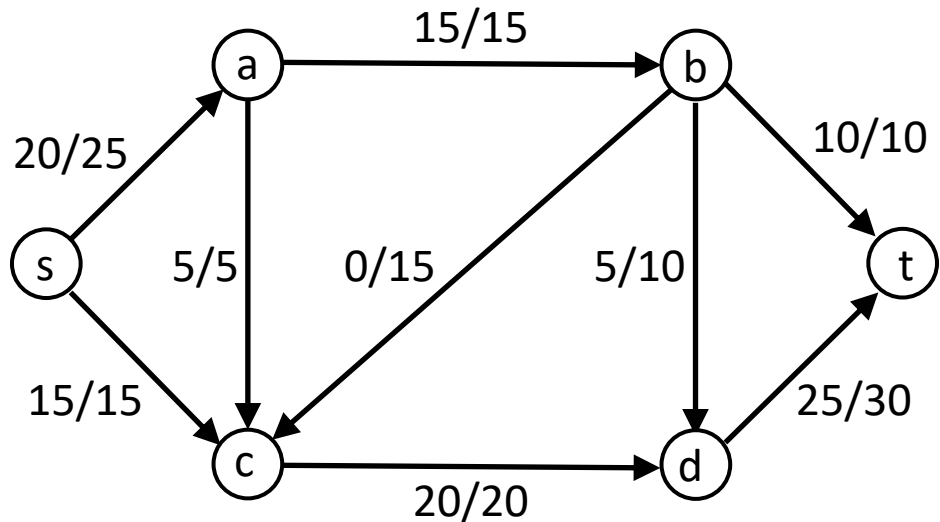
flow  $f''$   
 $\mathcal{V}(f'') = 30$



flow  $f''$   
 $\mathcal{V}(f'') = 30$

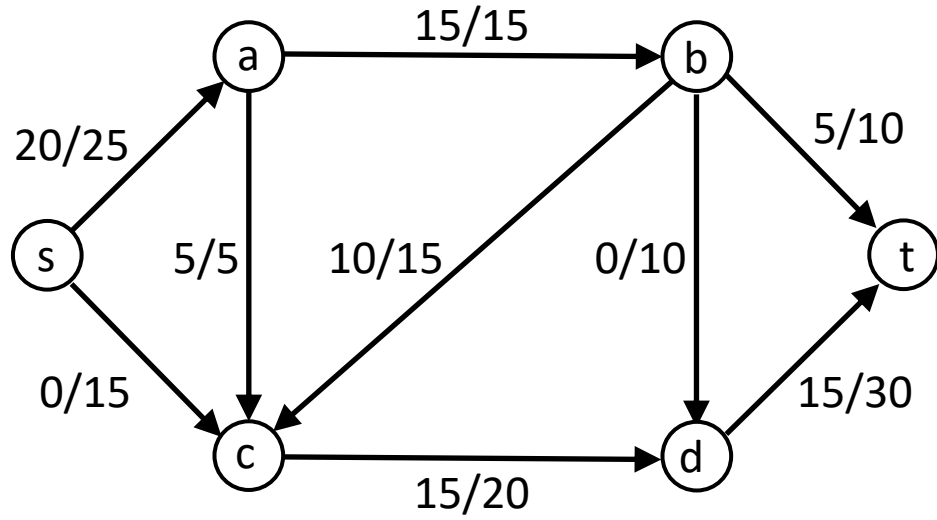


flow  $f'''$   
 $\mathcal{V}(f''') = 35$

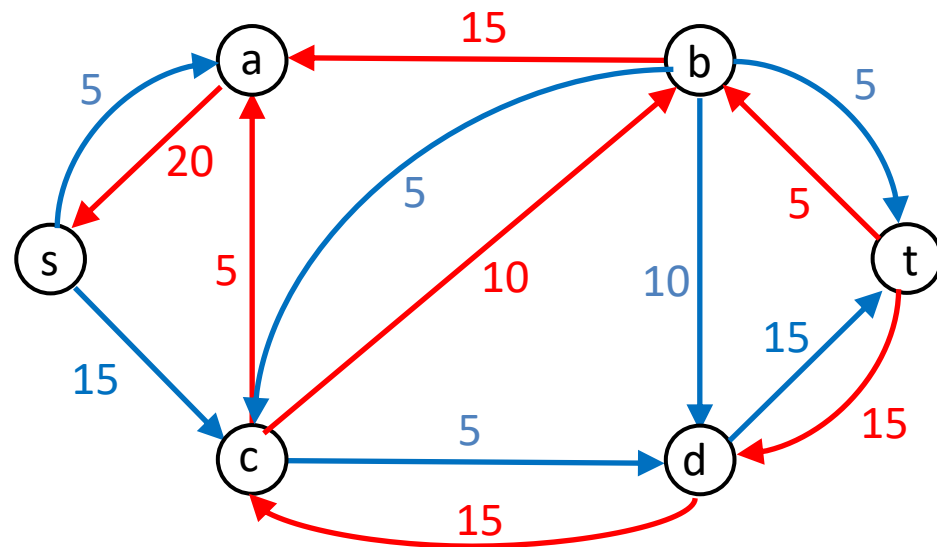


# Residual graph of flow in a network

a flow  $f$  in network  $\mathcal{F}$

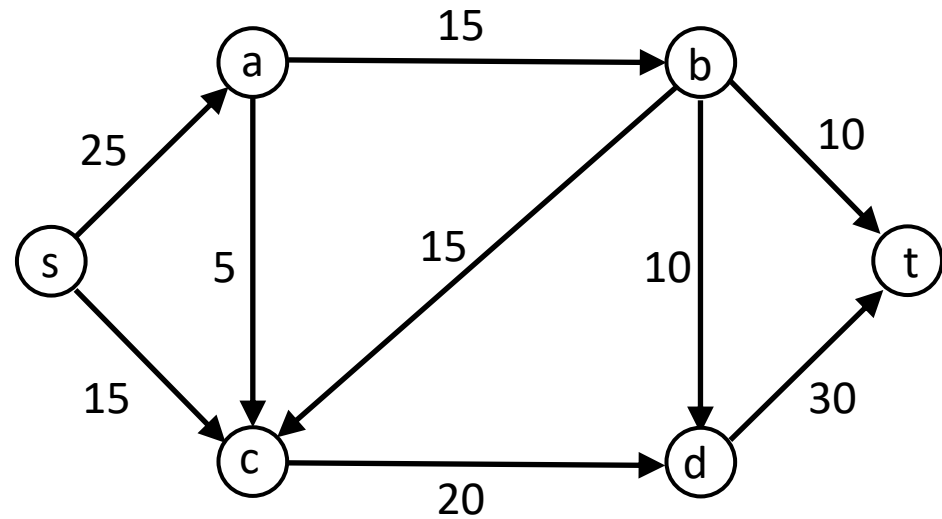


the residual graph  $\mathcal{F}_f$

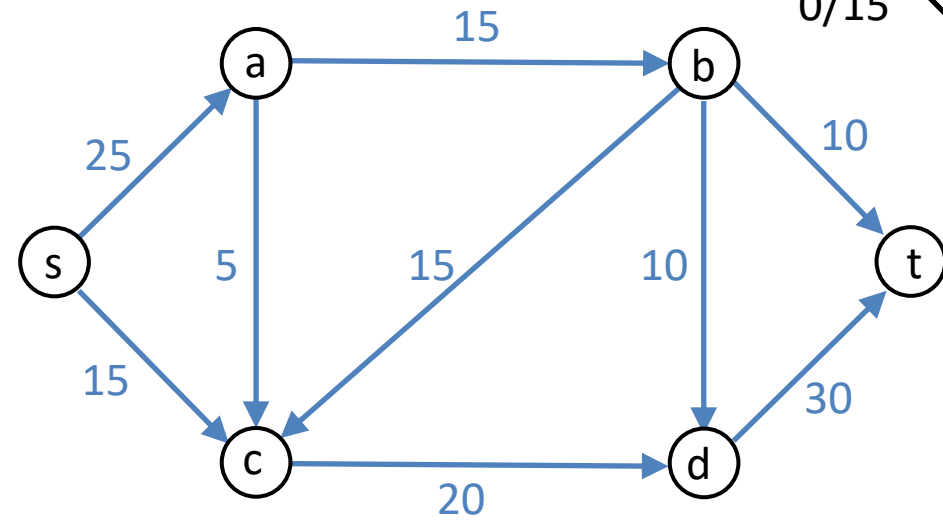
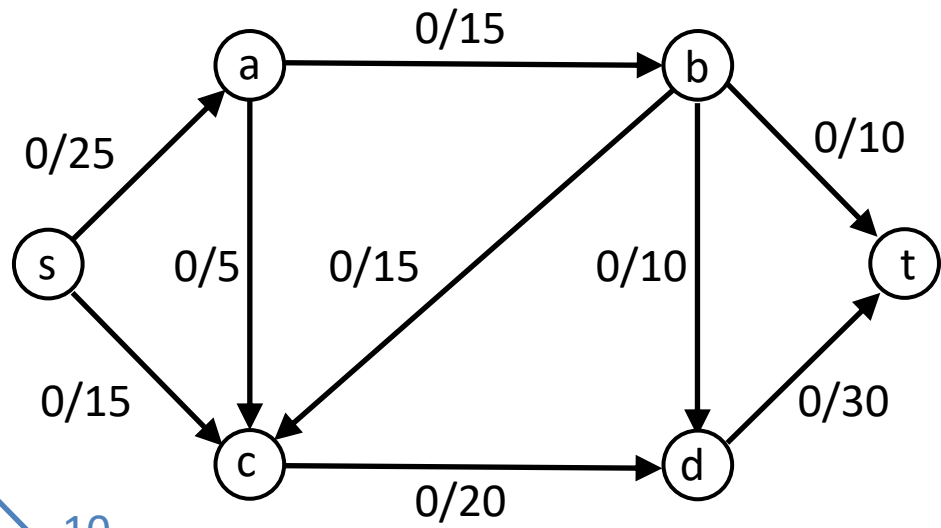


# Example of Ford-Fulkerson max flow algorithm

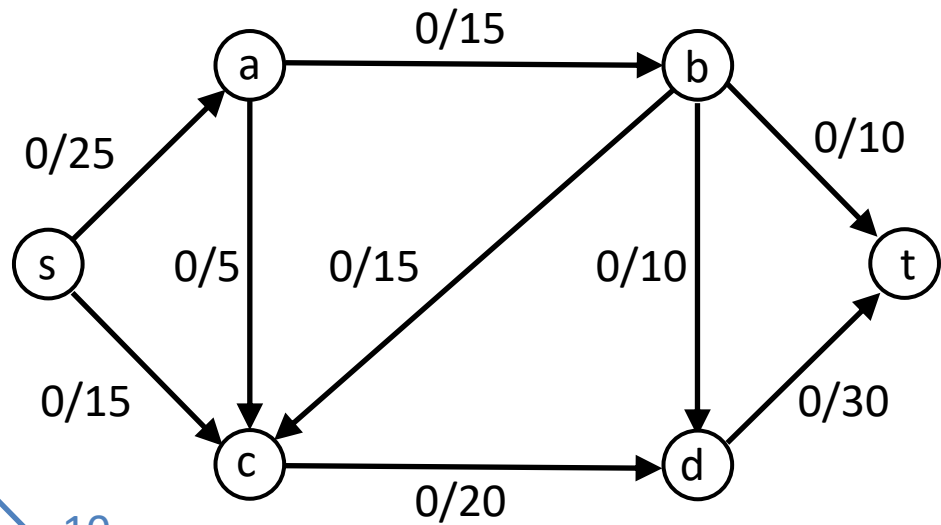
our input  
flow network  $\mathcal{F}$



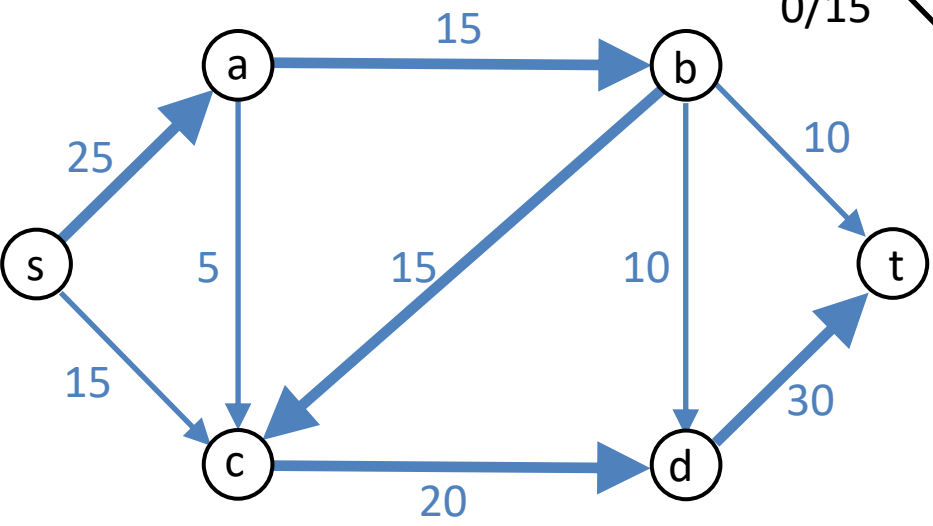
The trivial flow in  $\mathcal{F}$



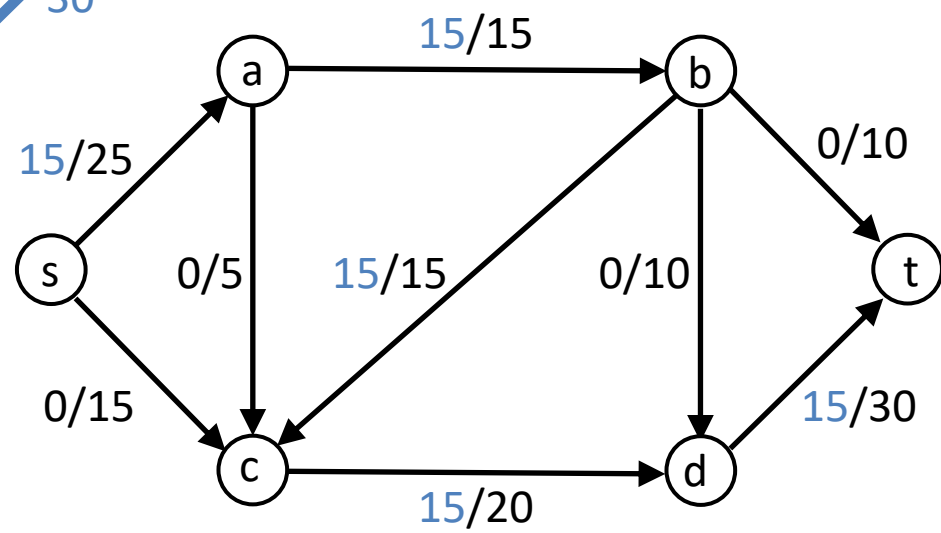
The residual graph



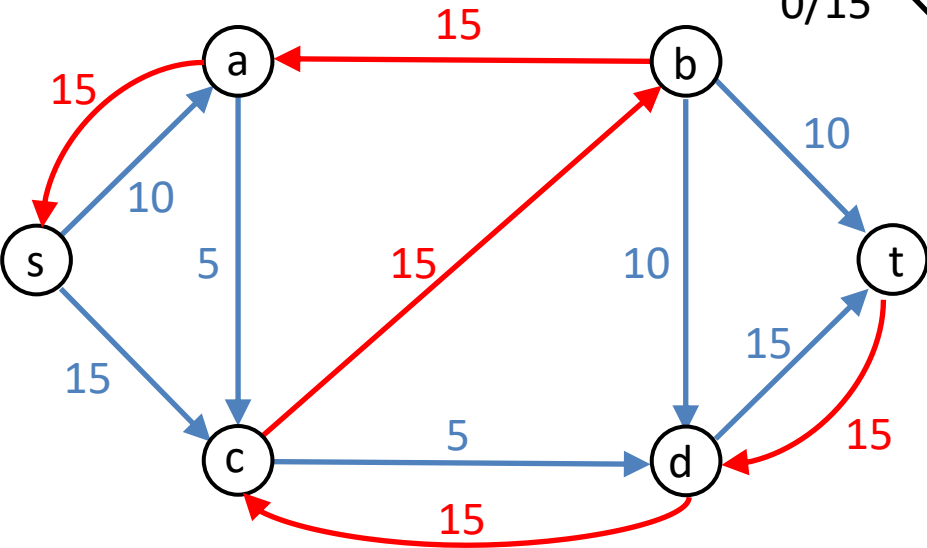
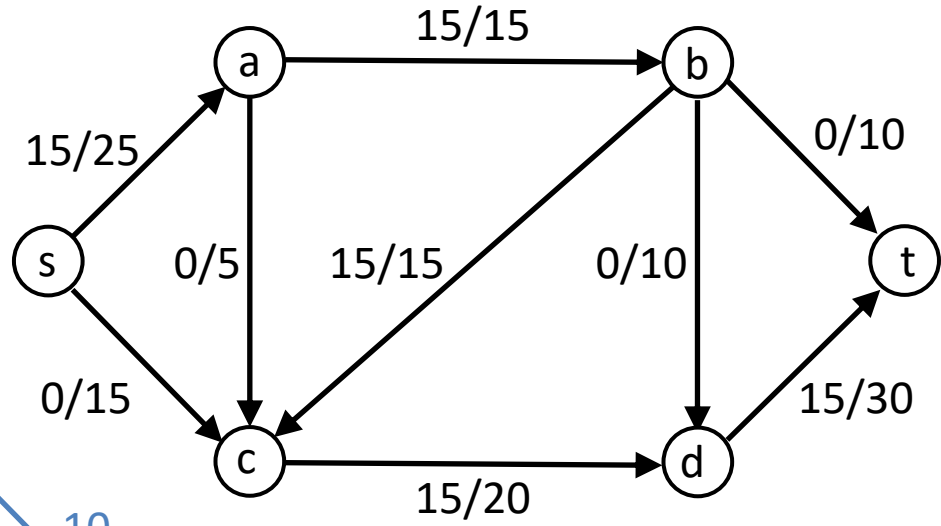
$b = 15$



augmented flow  
along the path shown

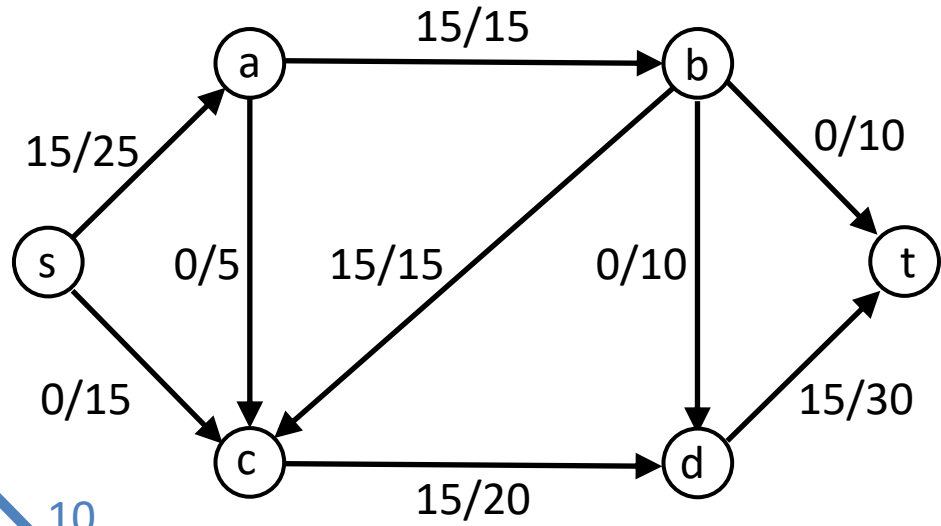


The new flow

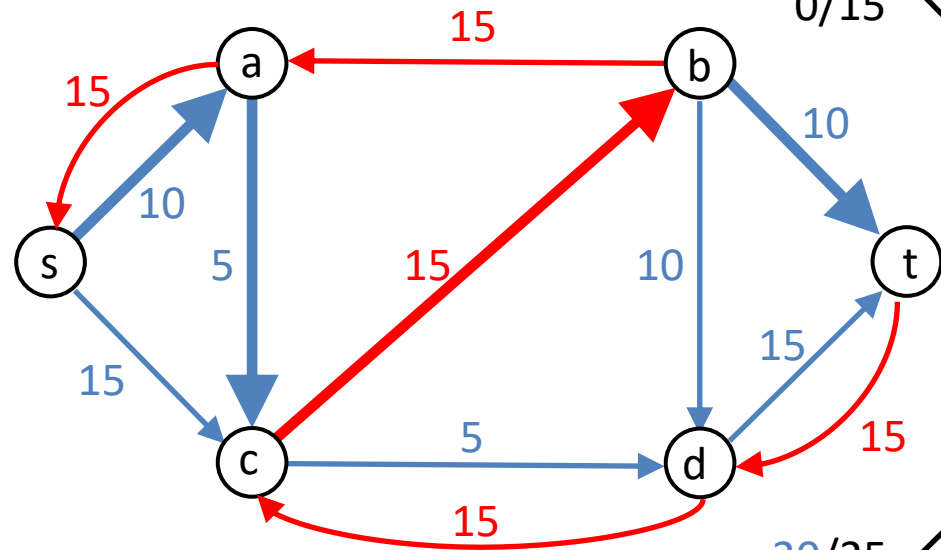
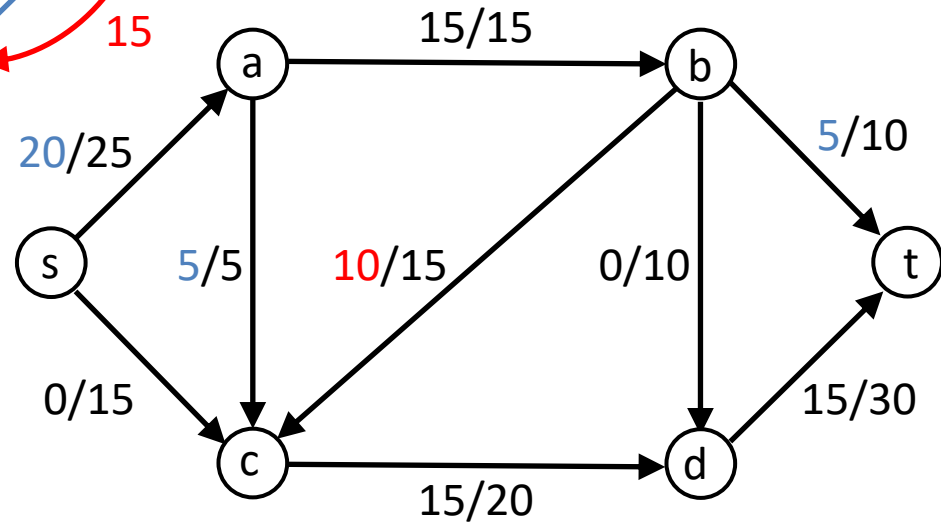


The residual graph



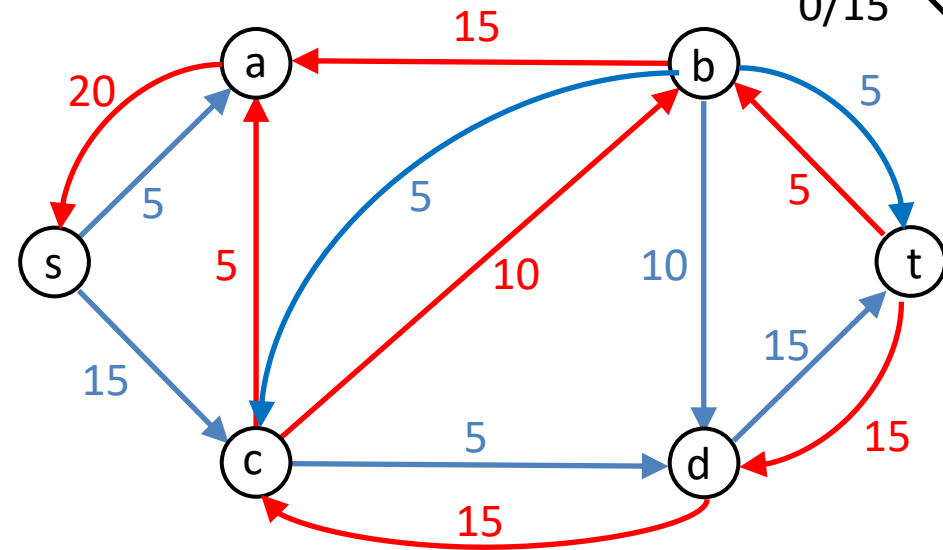
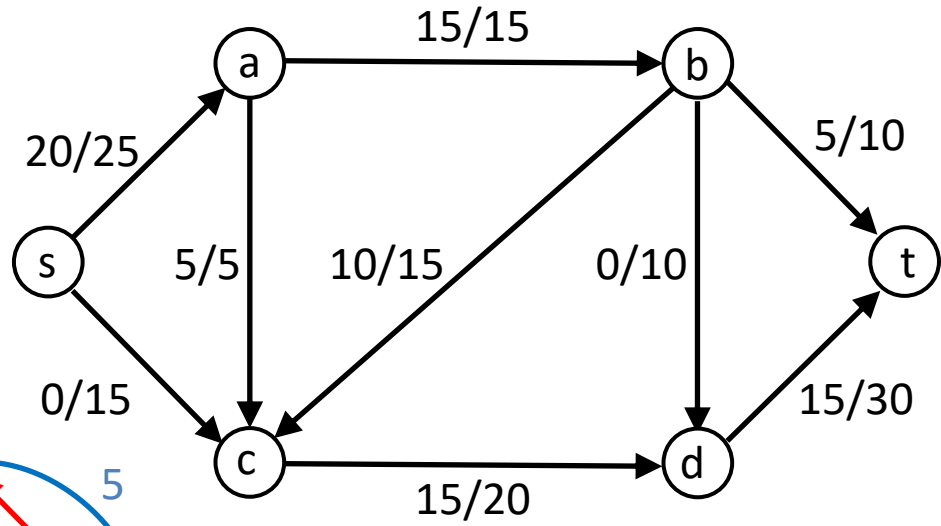


$b = 5$

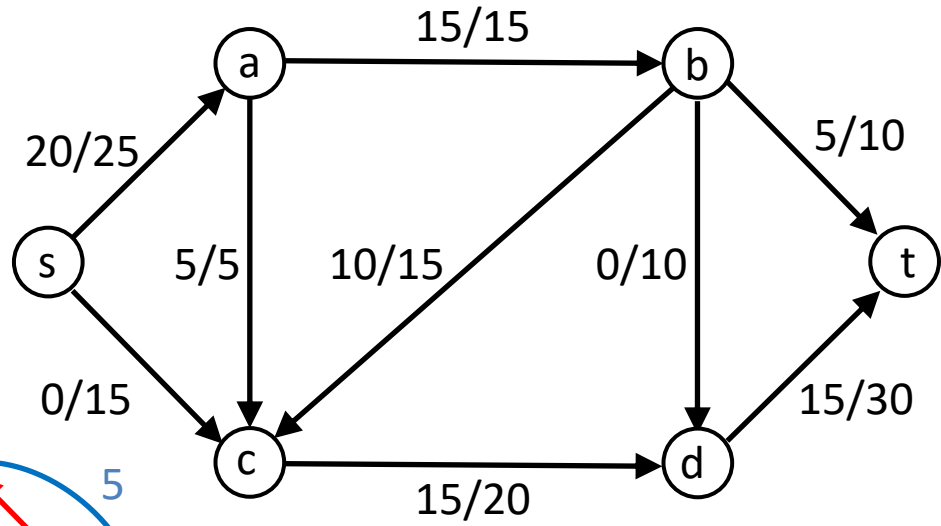


augmented flow  
along the path shown

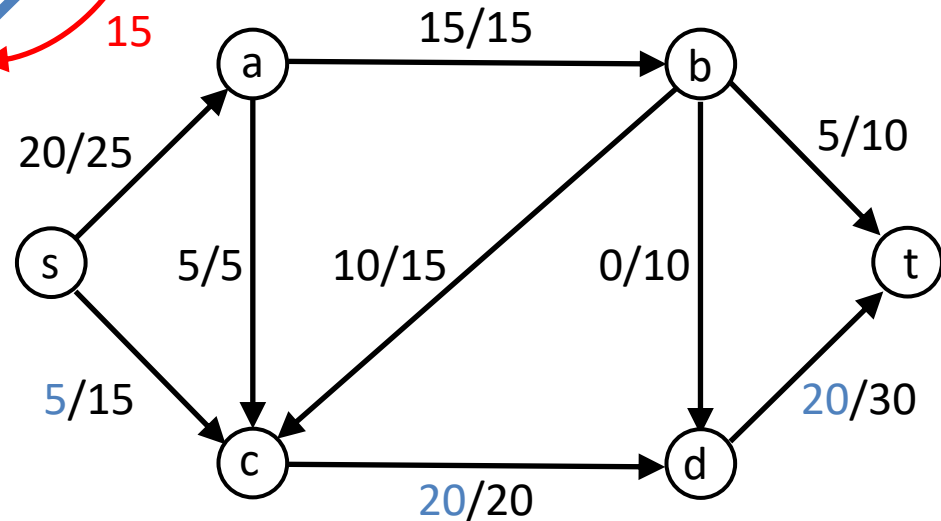
The new flow



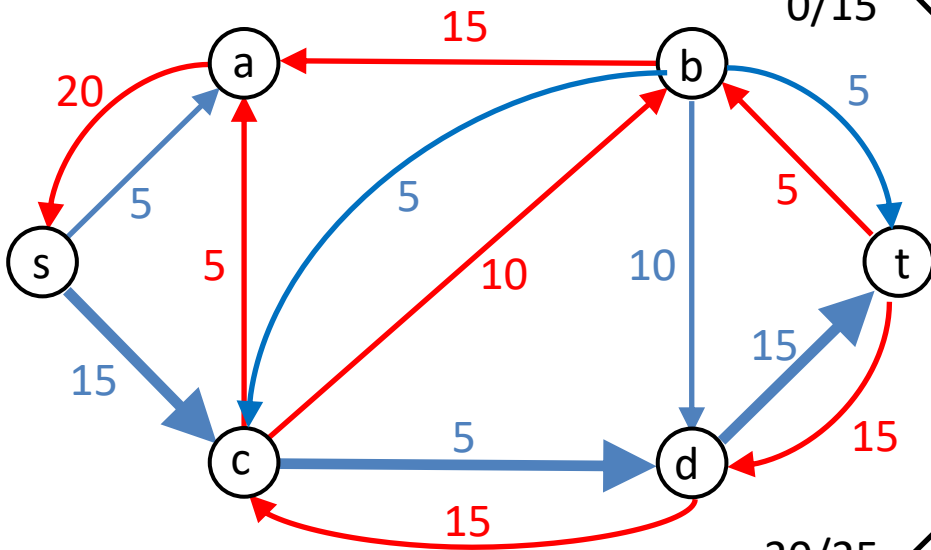
The residual graph



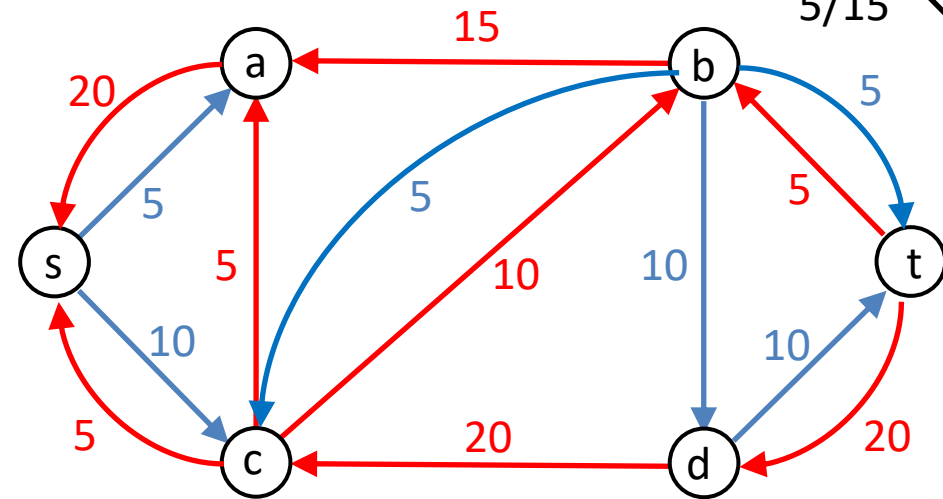
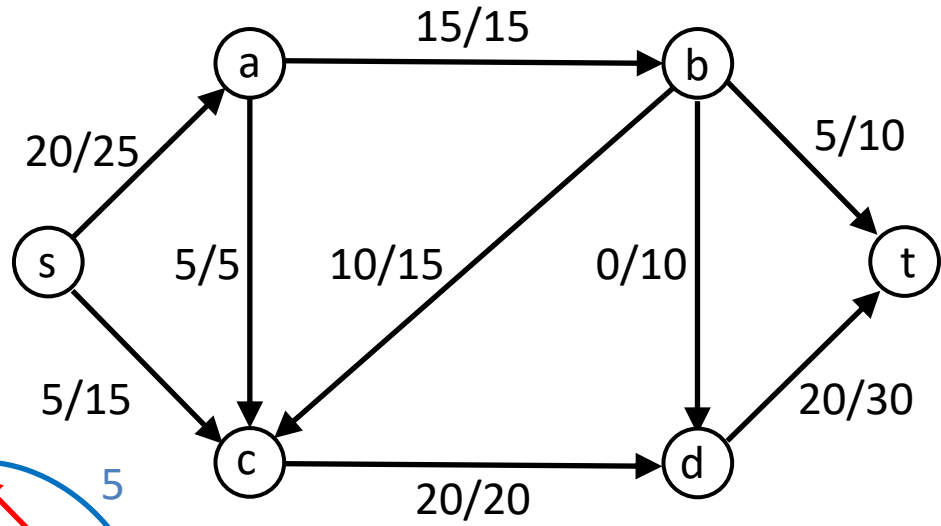
$b = 5$



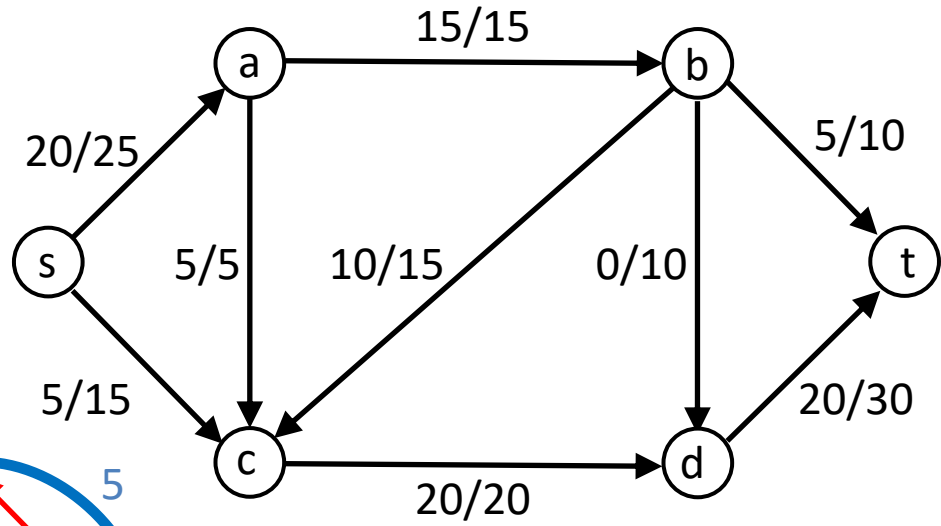
augmented flow  
along the path shown



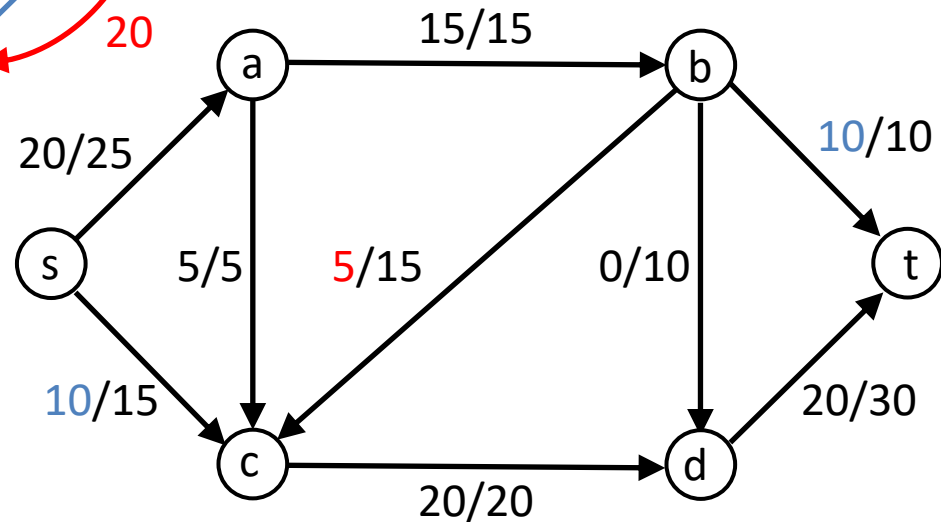
The new flow



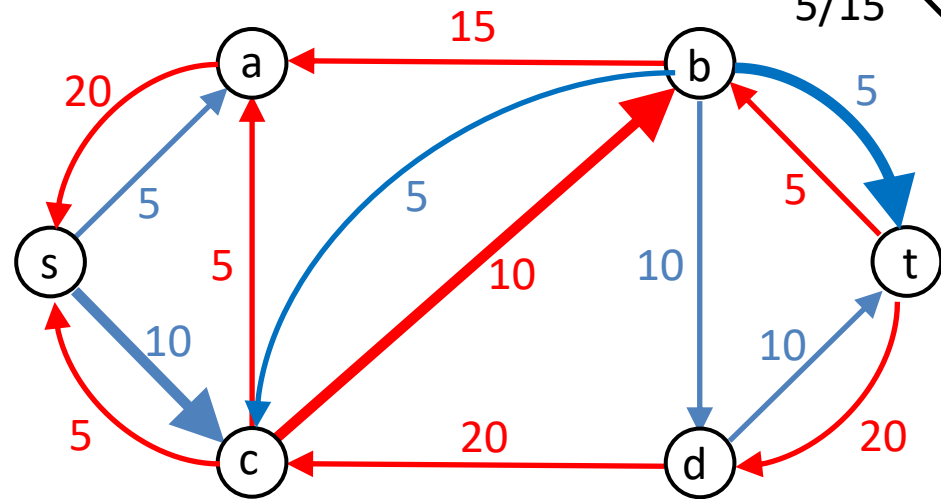
The residual graph



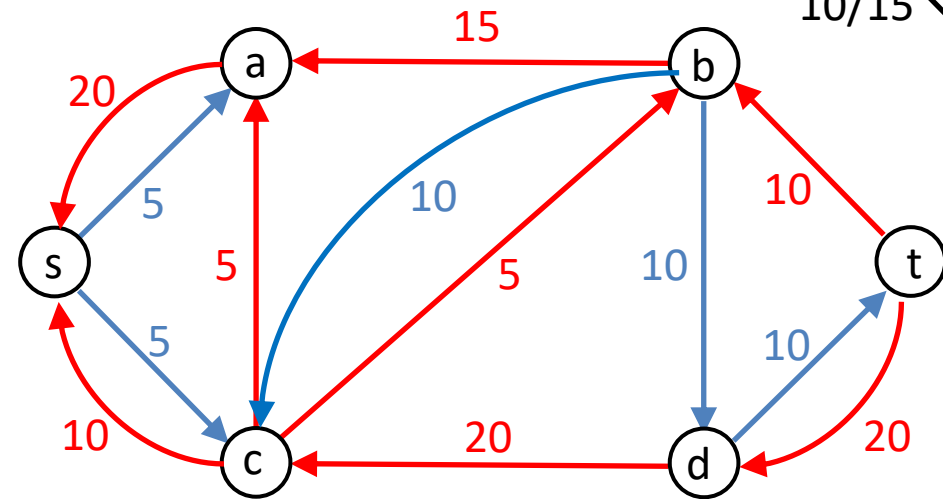
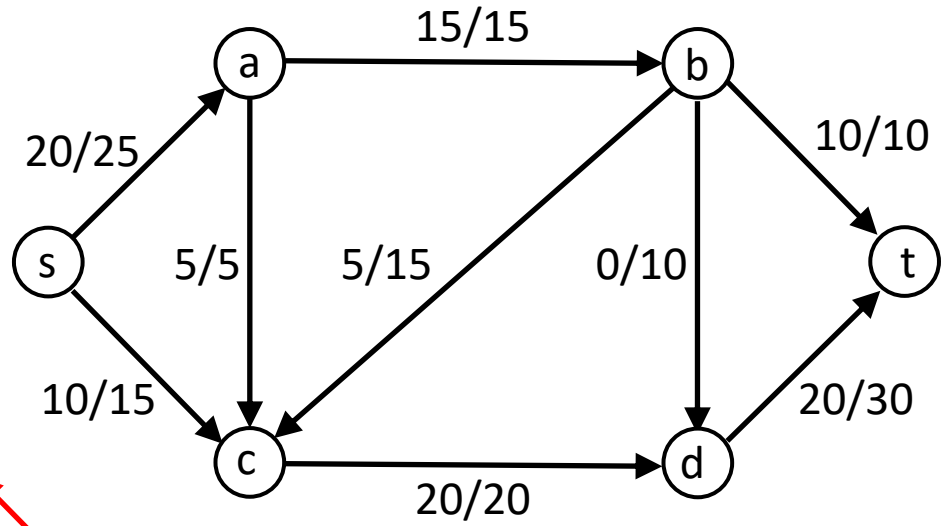
$b = 5$



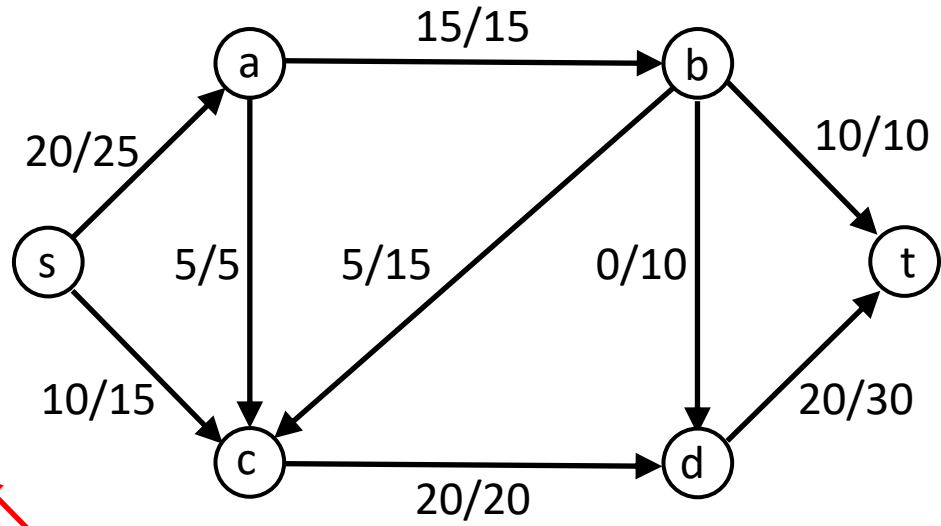
augmented flow  
along the path shown



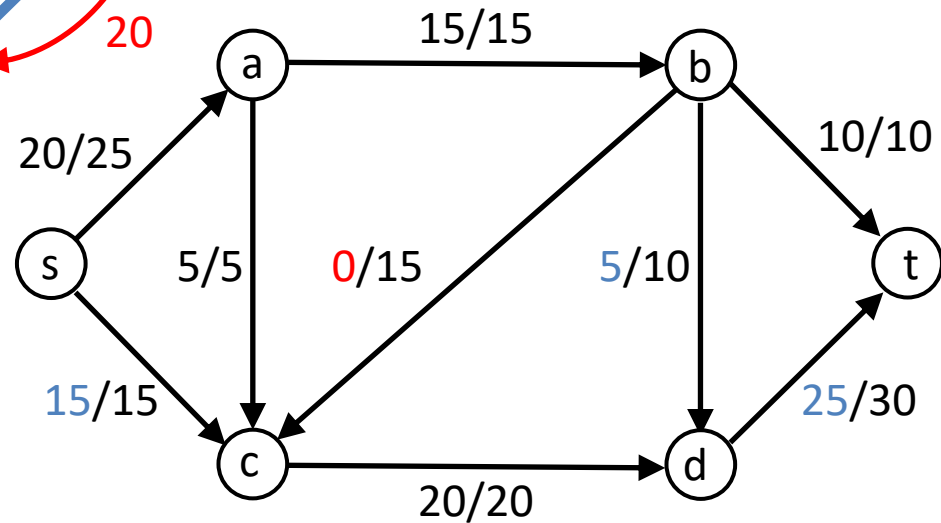
The new flow



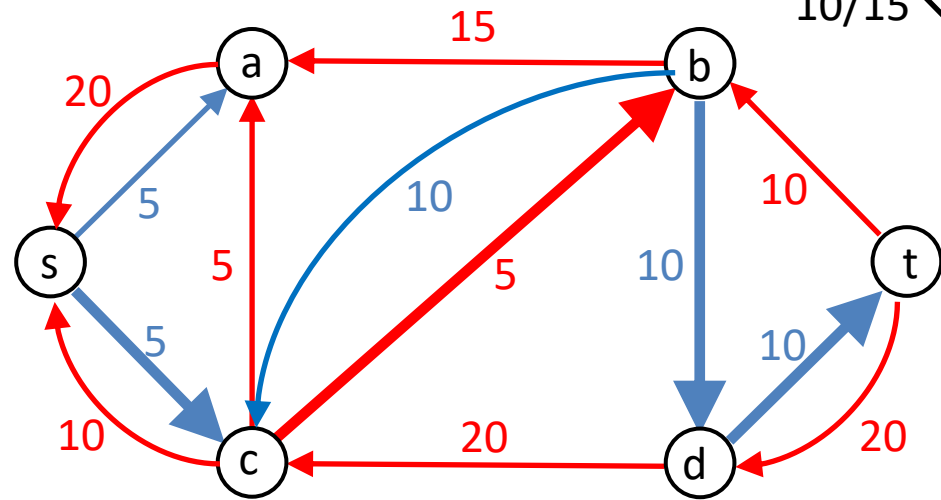
The residual graph



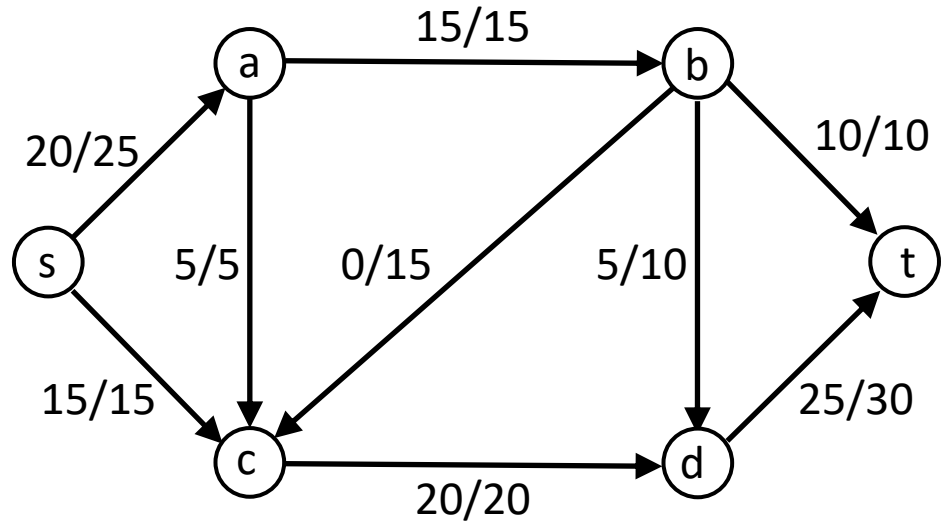
$b = 5$



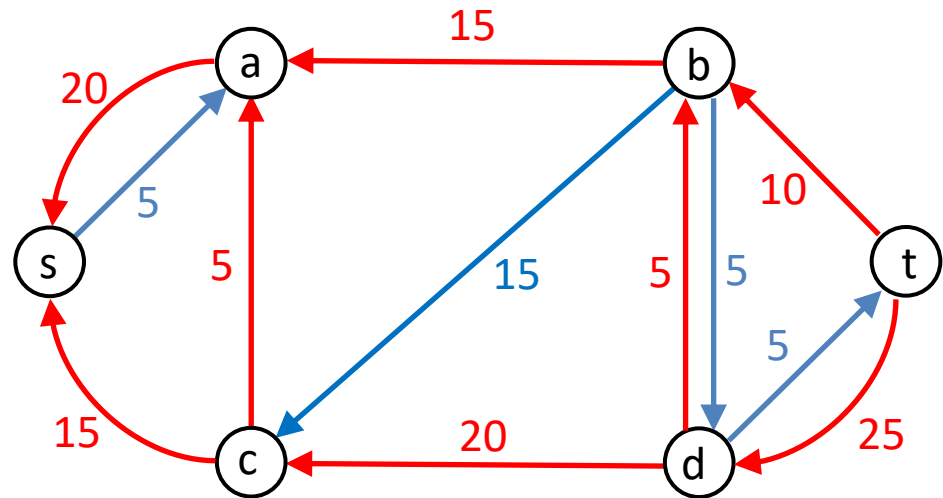
augmented flow  
along the path shown



The new flow



The residual graph

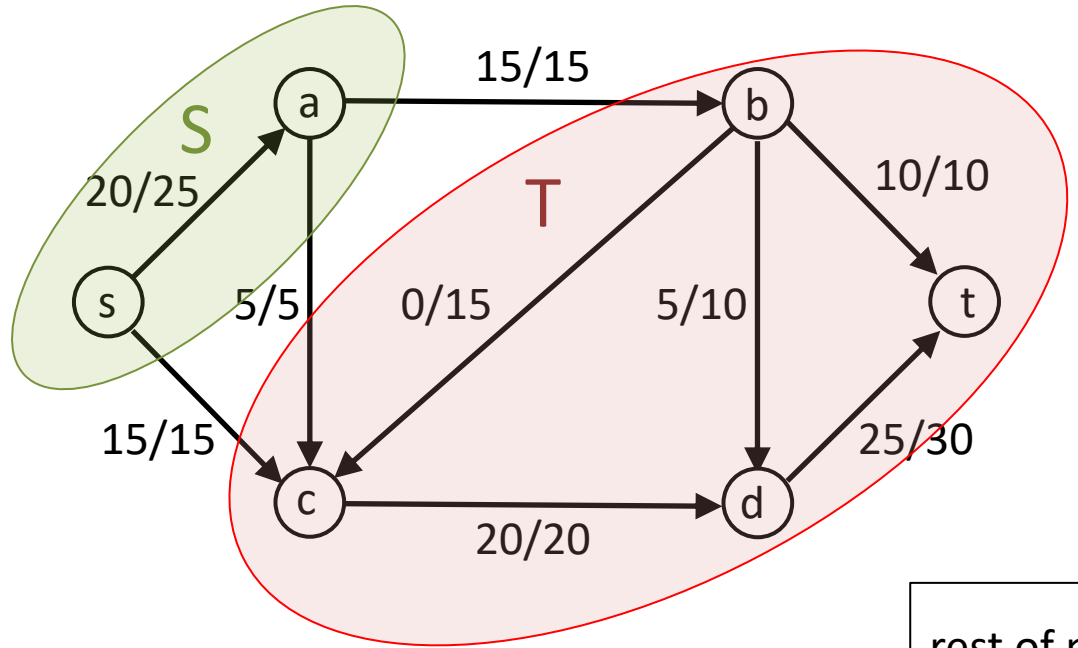


no  $s \rightarrow t$  path

$\Rightarrow$  above flow is max



value of flow = 35  
capacity of cut = 35



set of nodes reachable from  $s$  in residual graph

