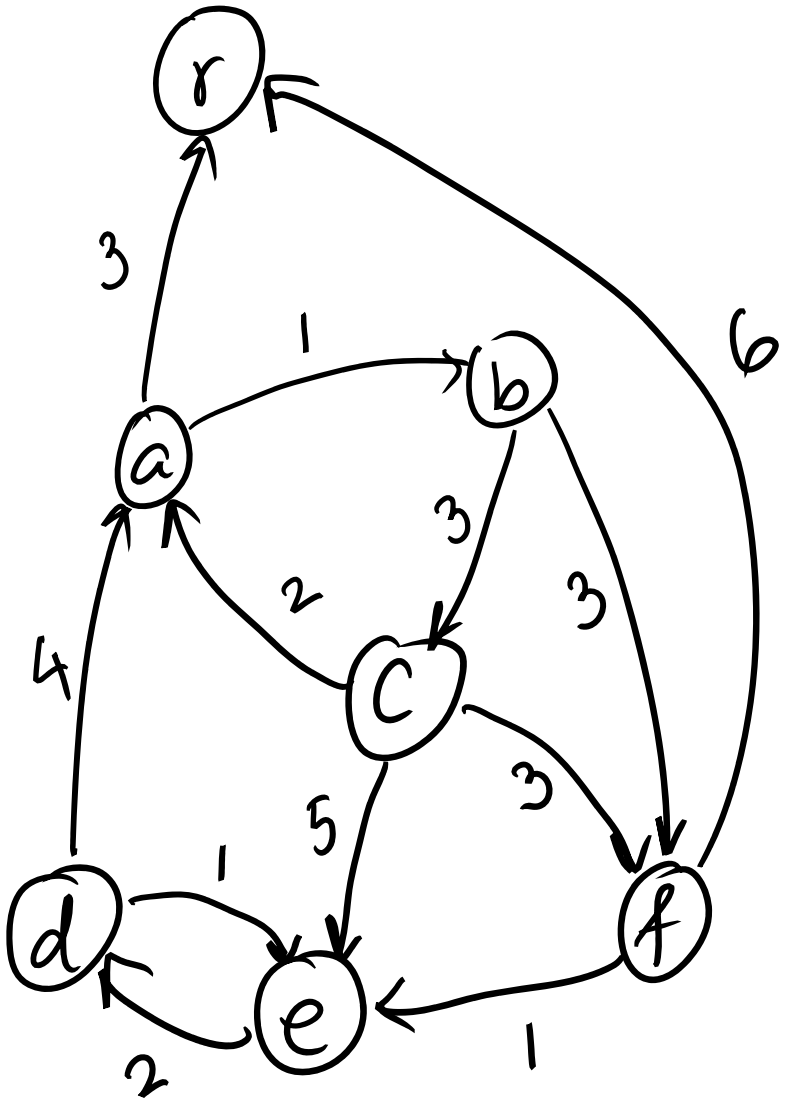
Animation of Edmonds' Min-cost Arborescence Algorithm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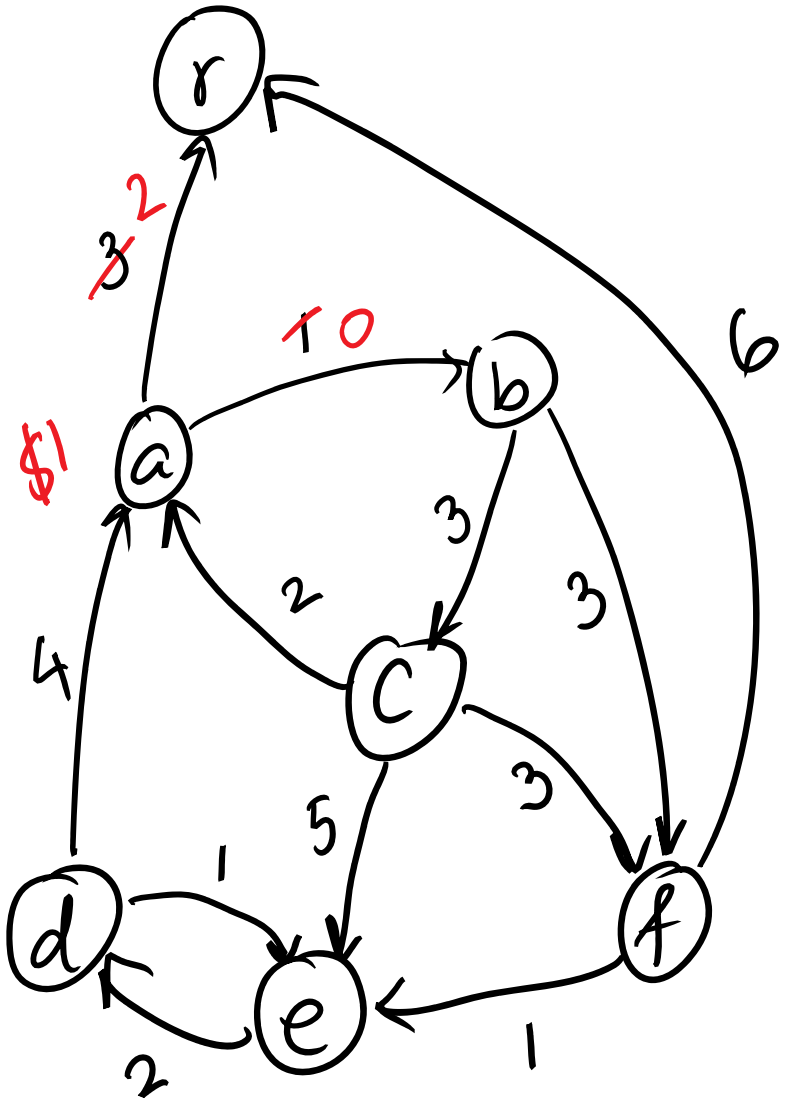
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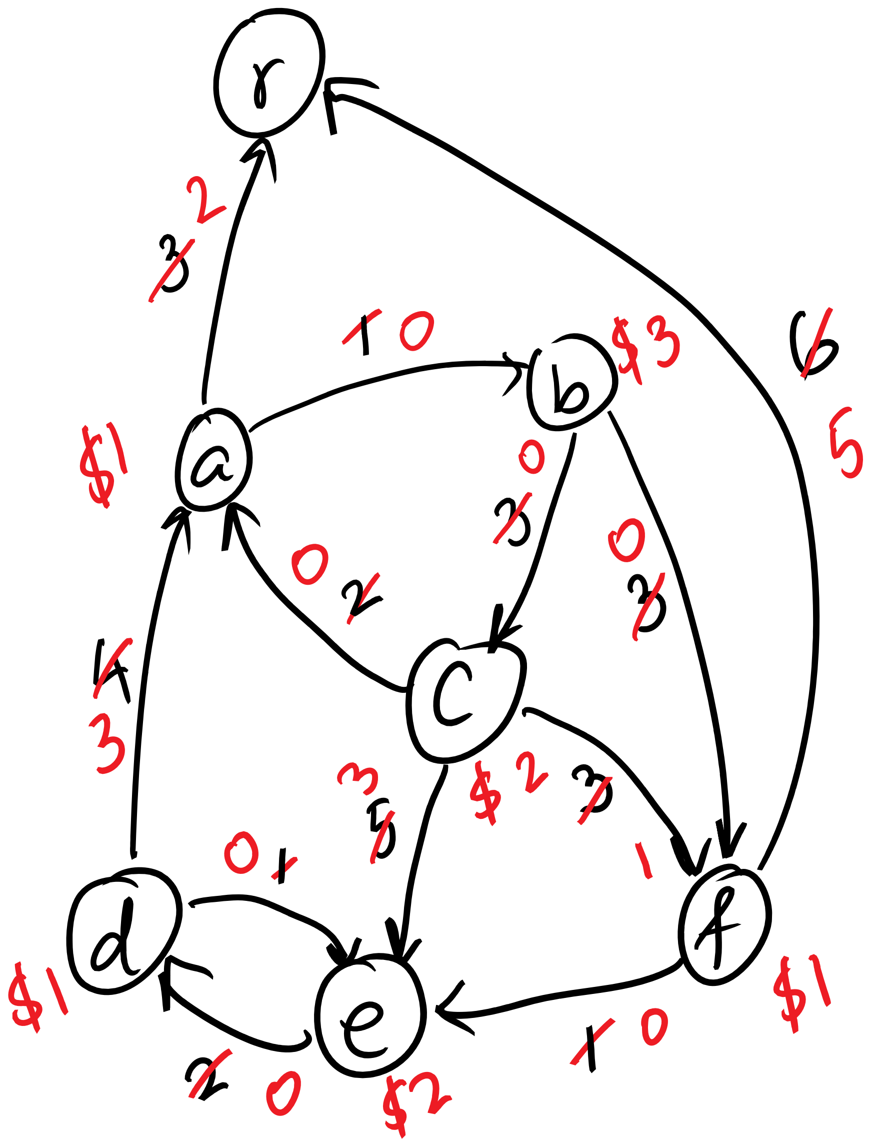
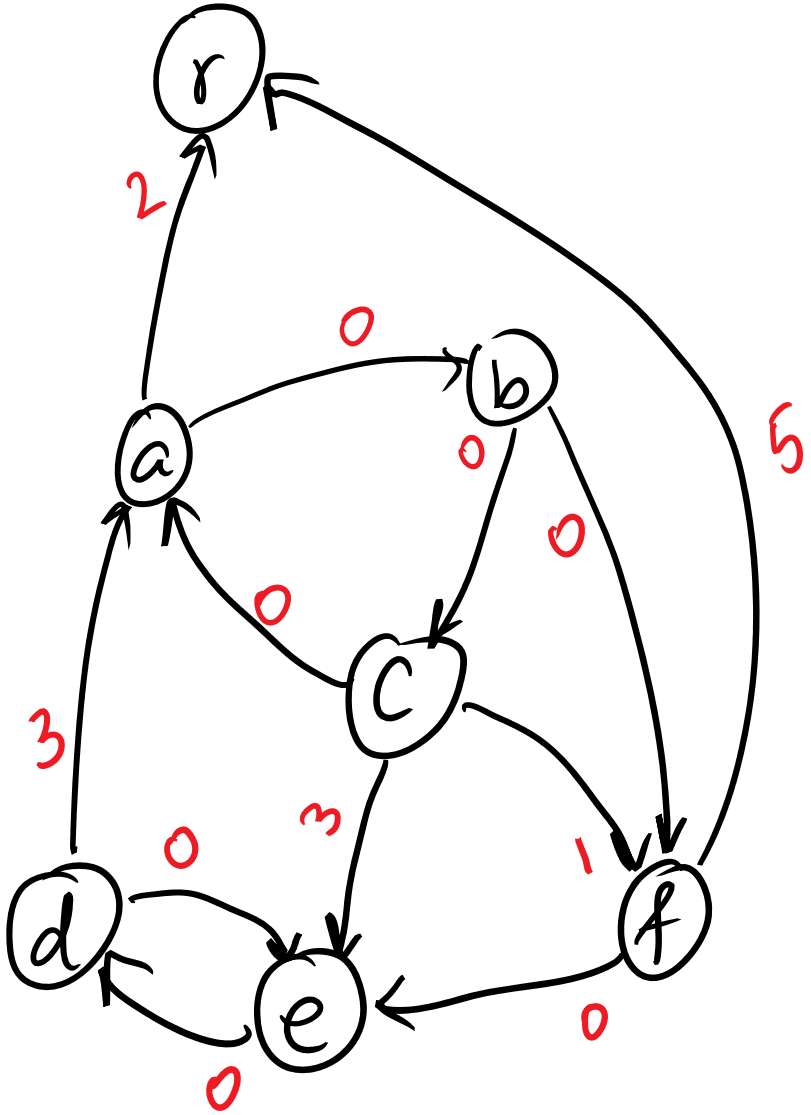
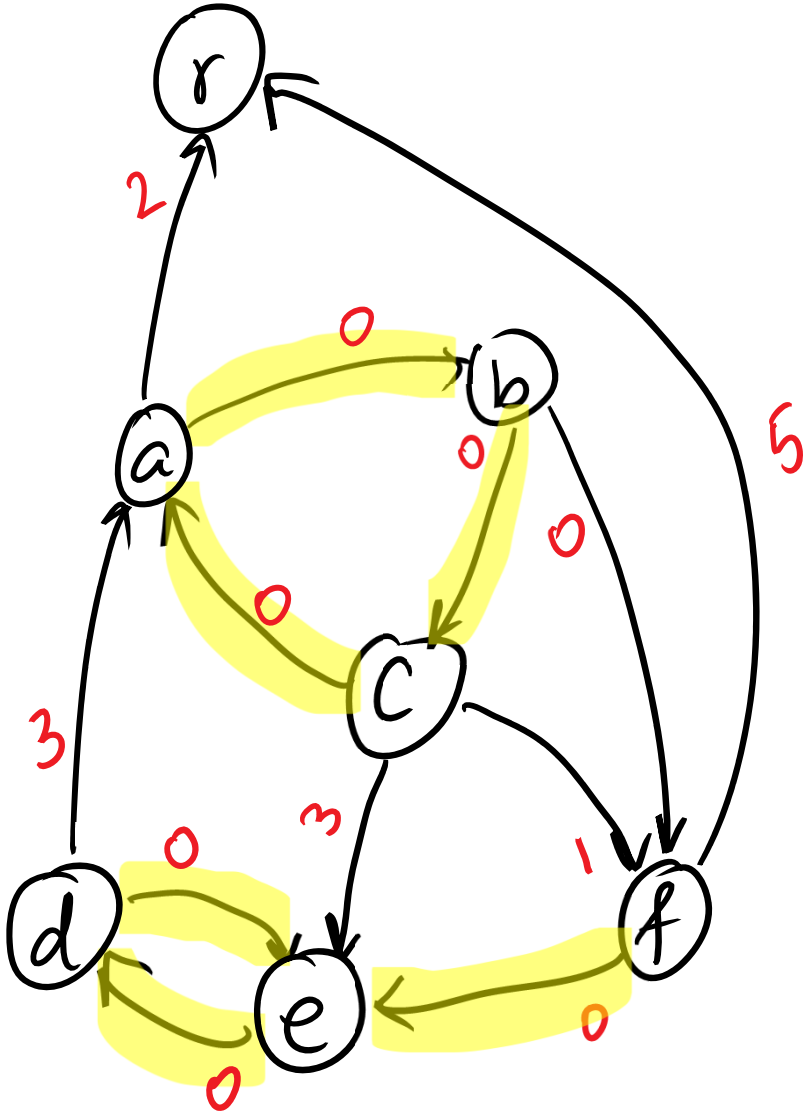


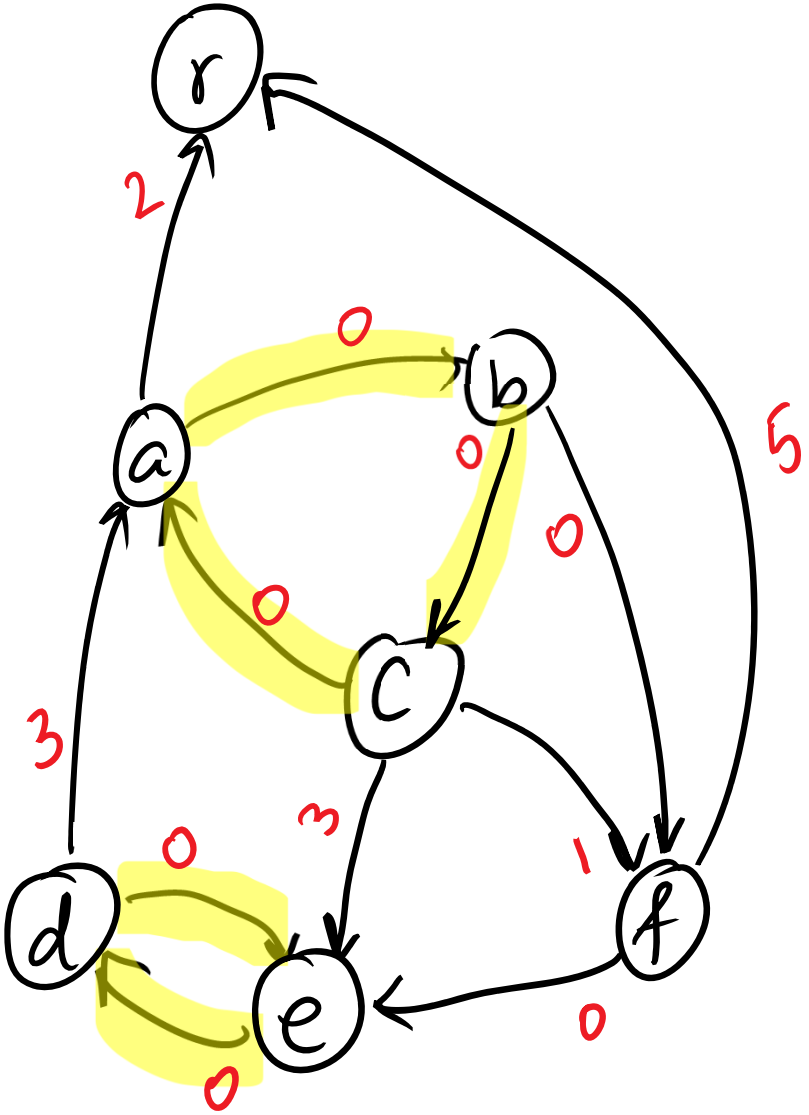
Now every node has at least one zero-cost edge leaving it

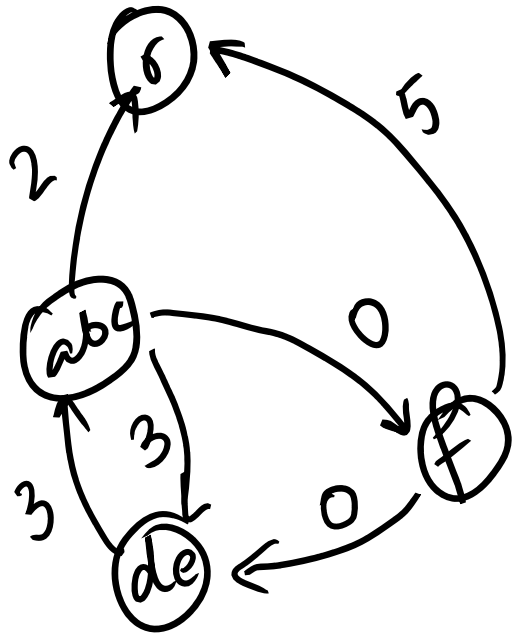


Just cleaned up the figure…

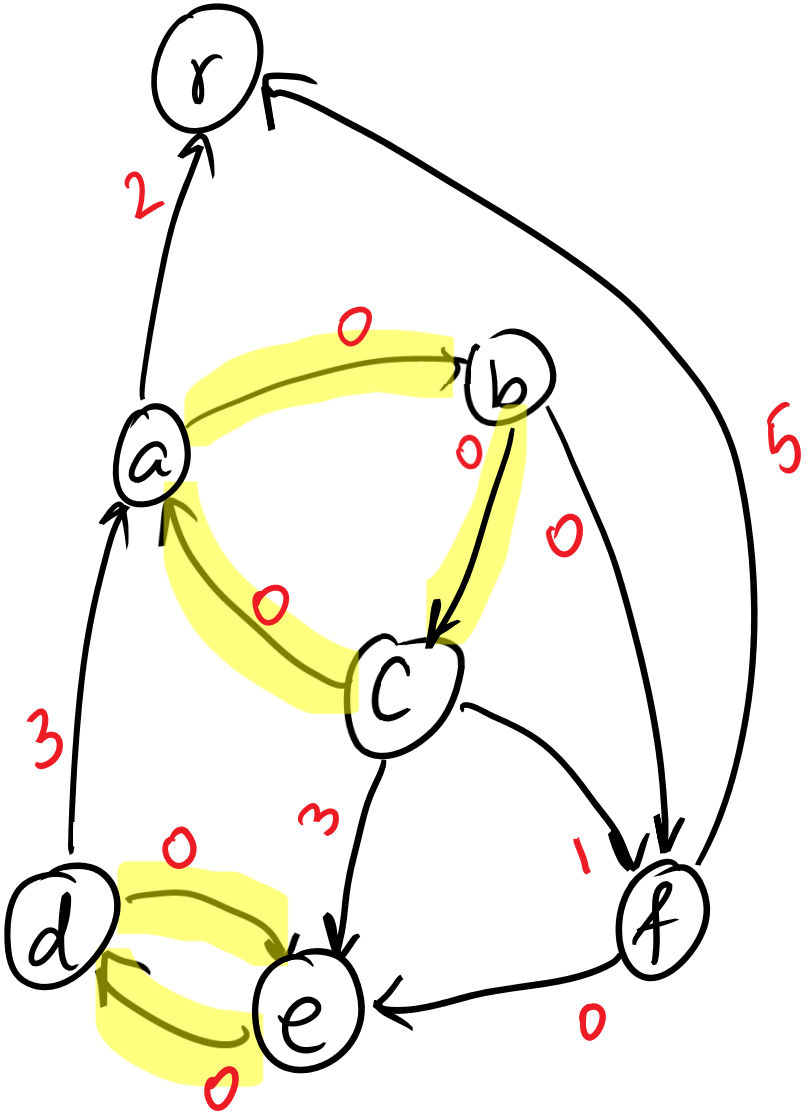


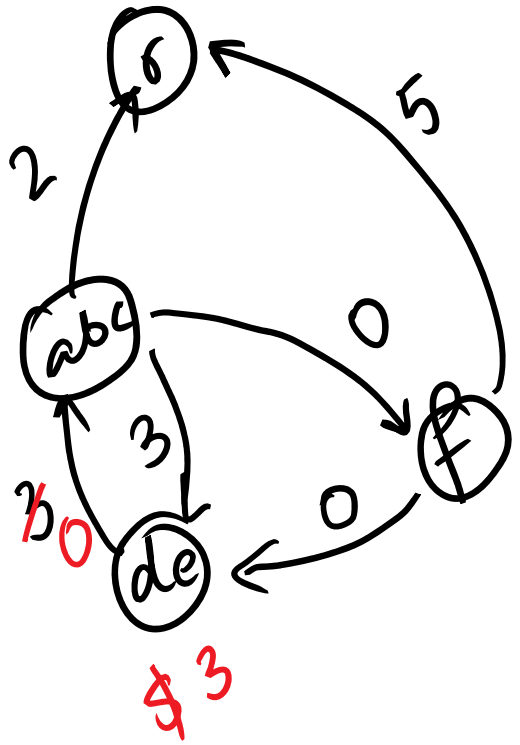
Each node picks one
zero-cost edge leaving it



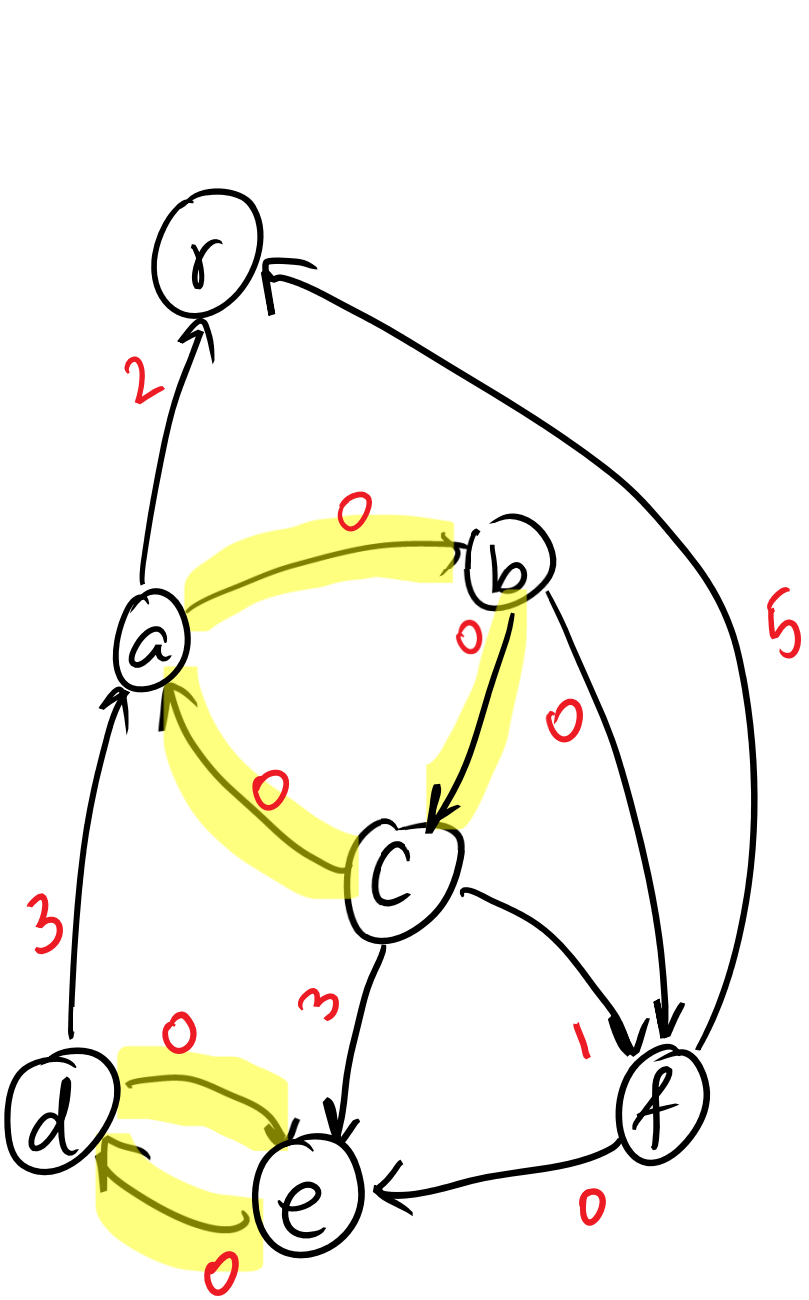


Contract zero-cost cycles





And repeat...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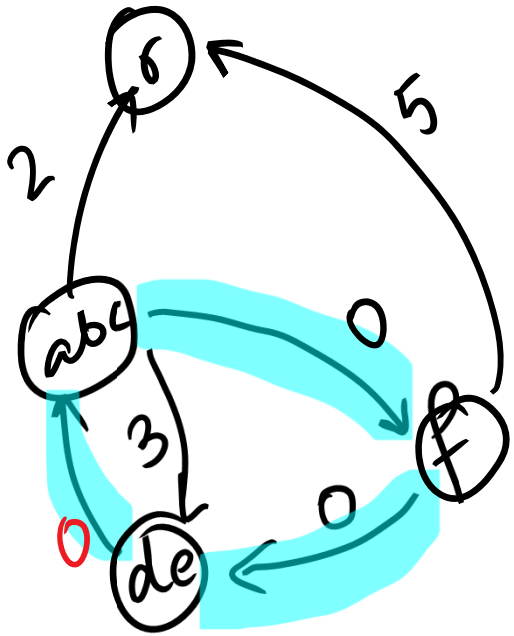
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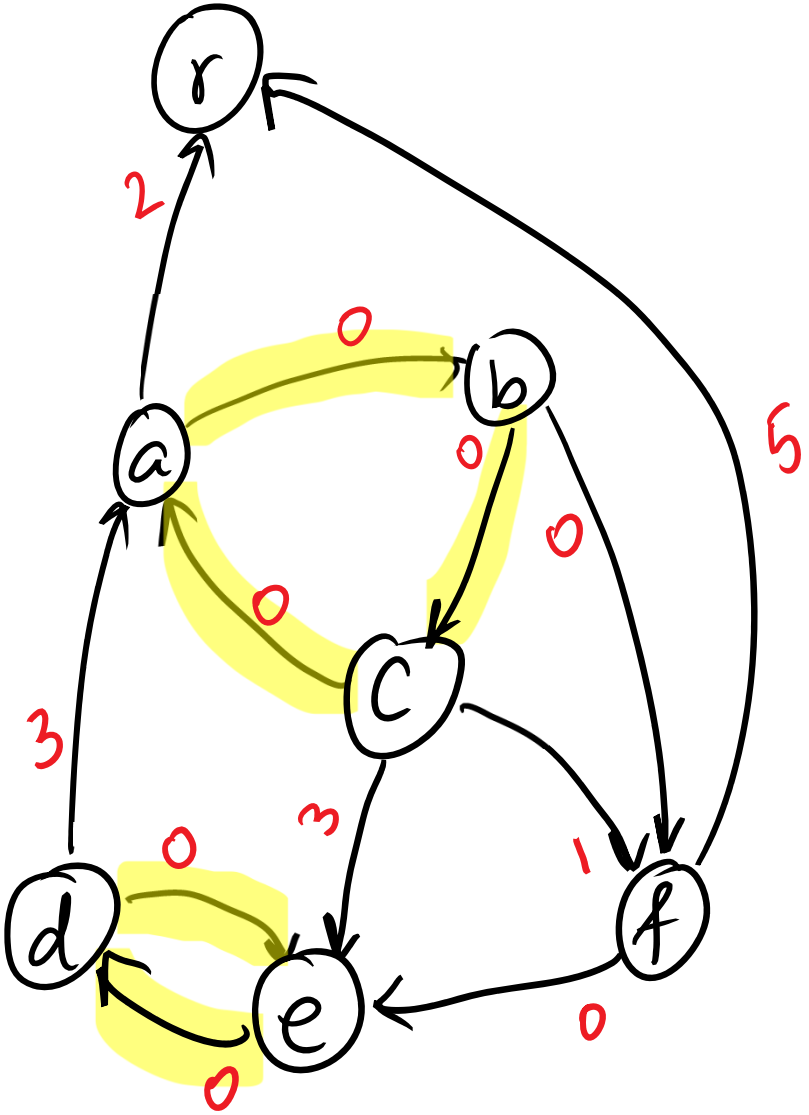
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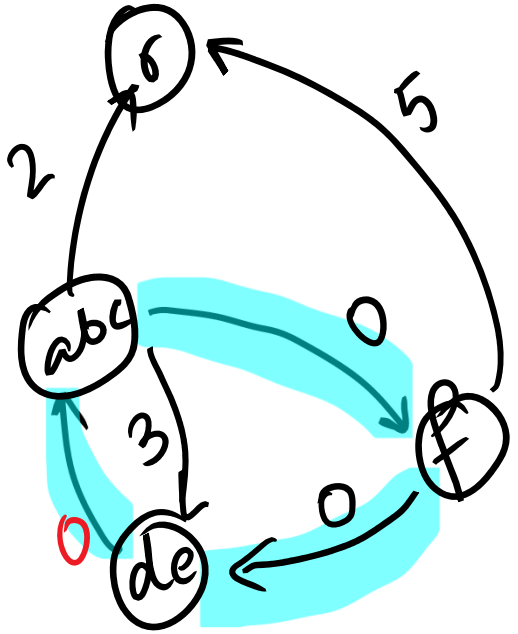
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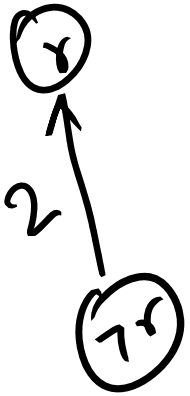
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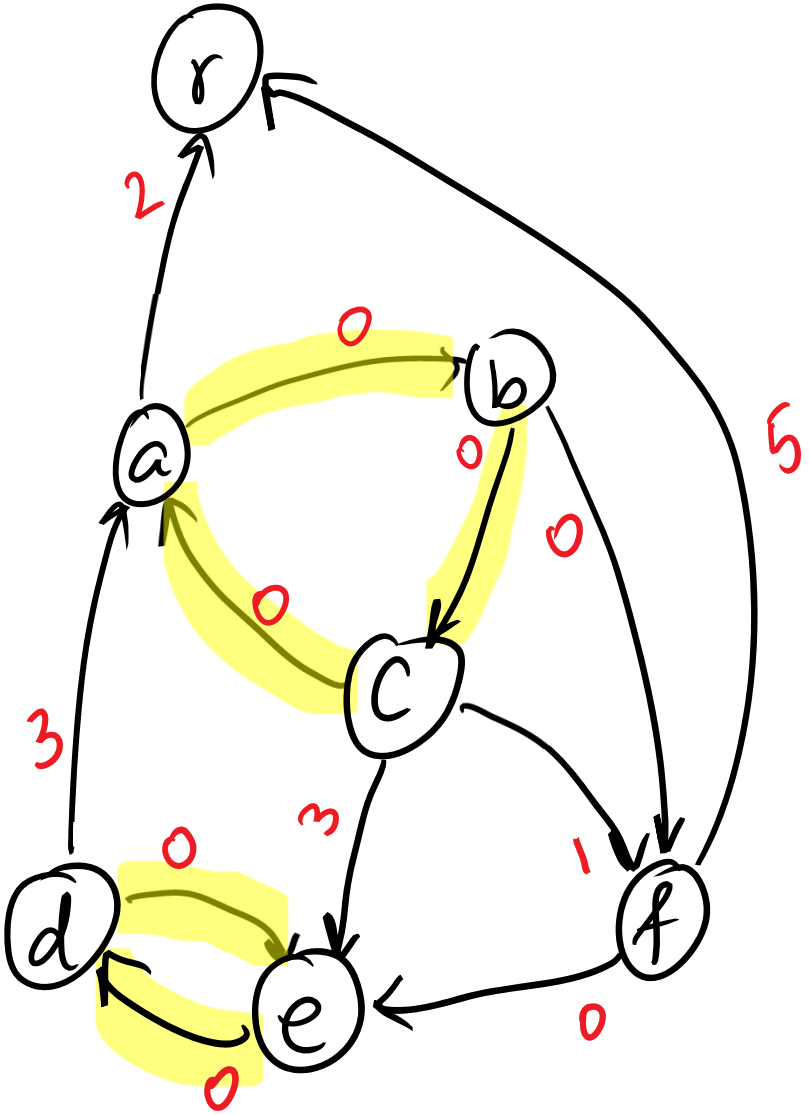
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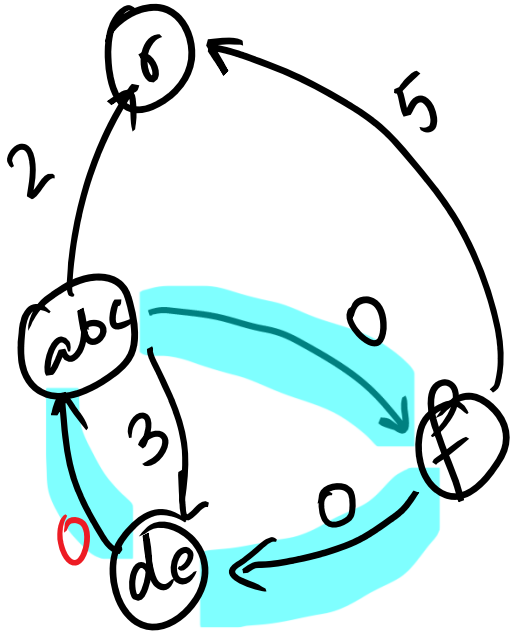
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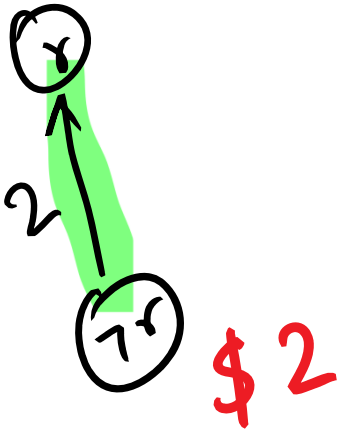
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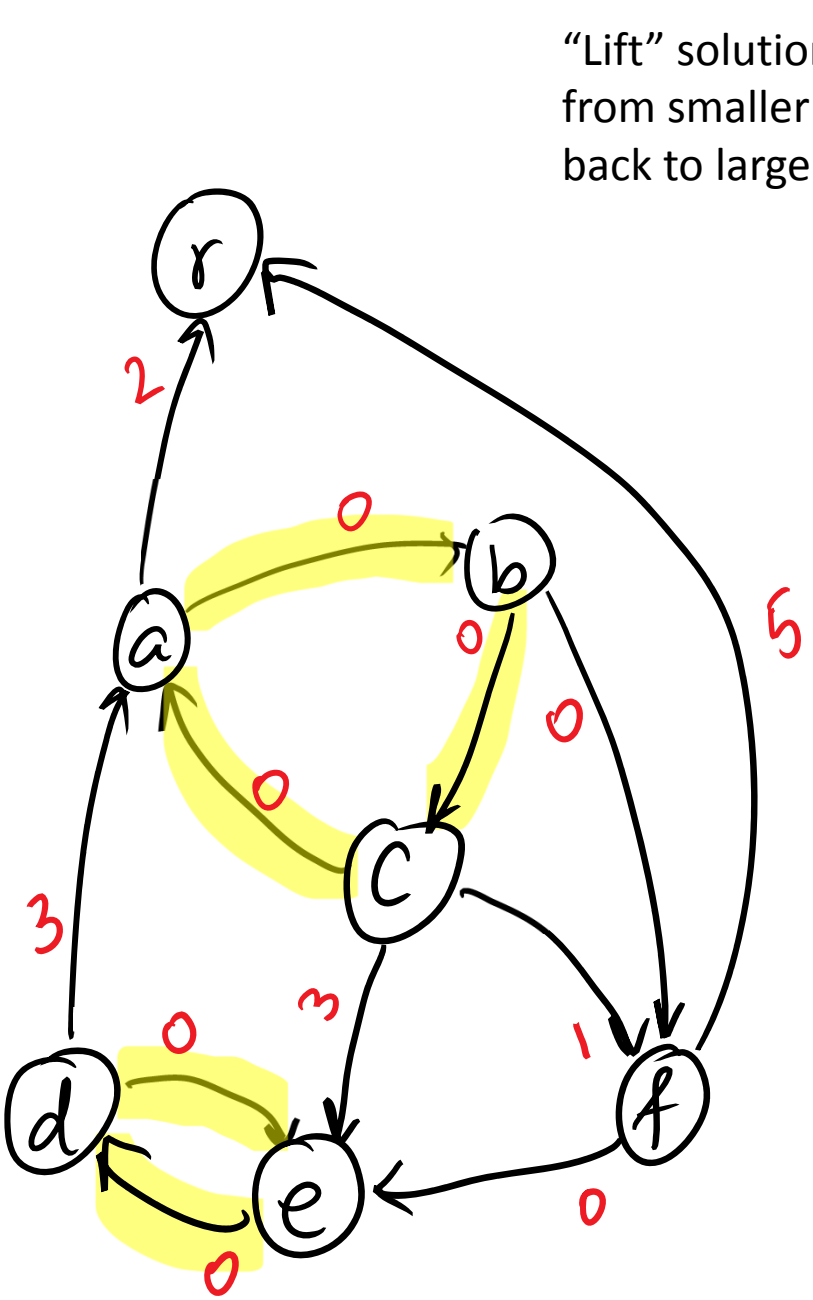
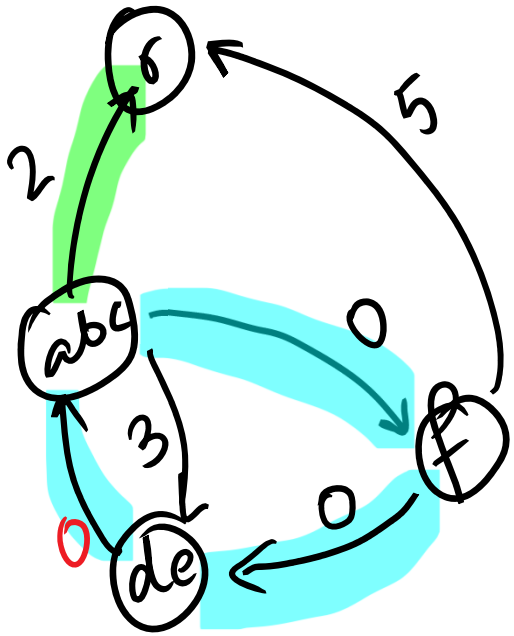
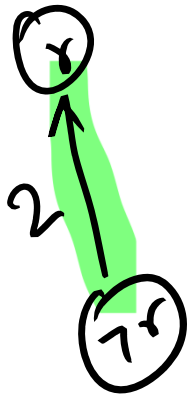
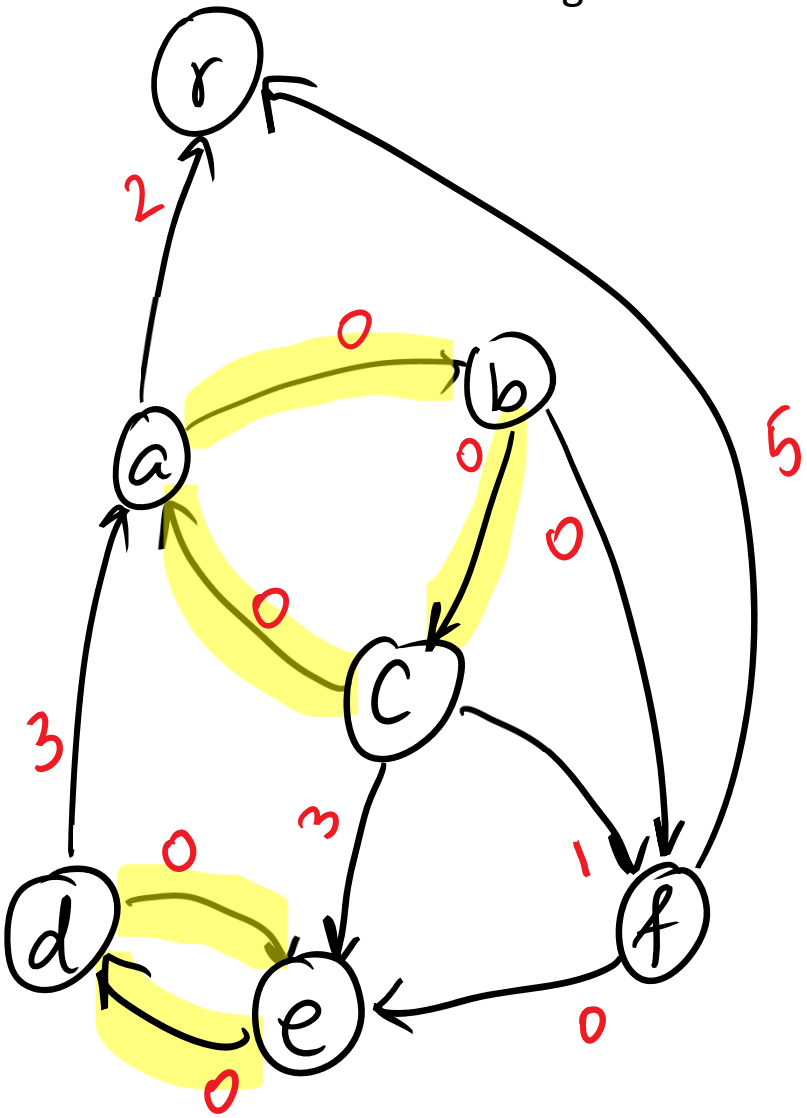
"Lift" solution
from smaller instance
back to larger one

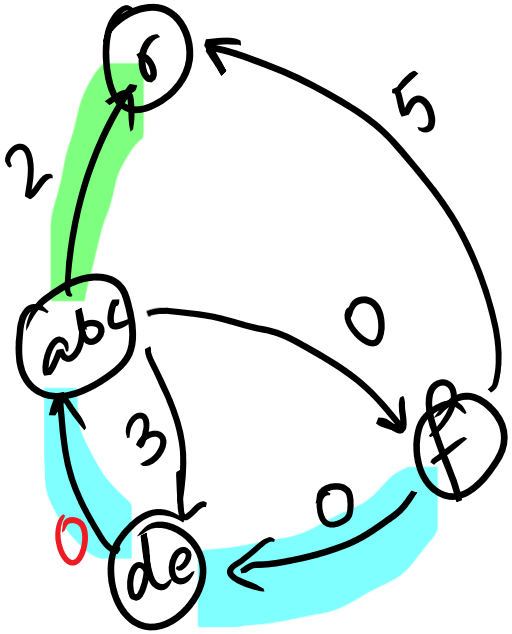


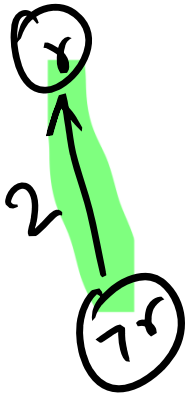




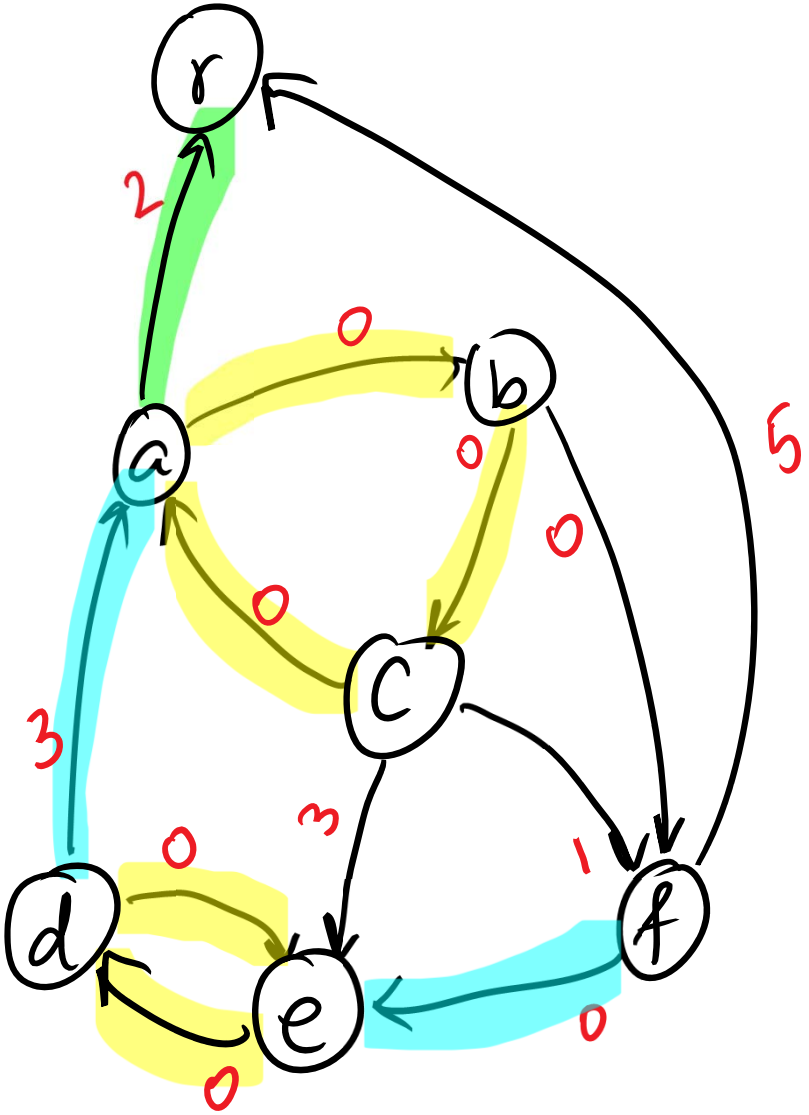
And remove useless zero-cost edge(s) to get back solution

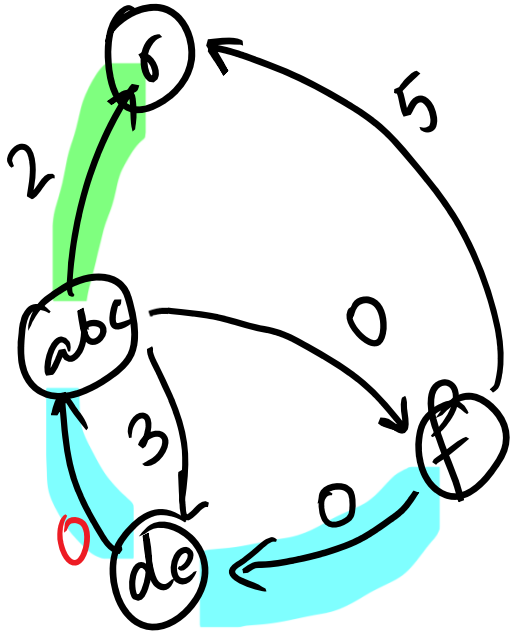


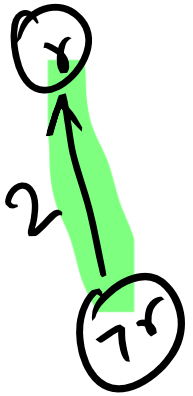




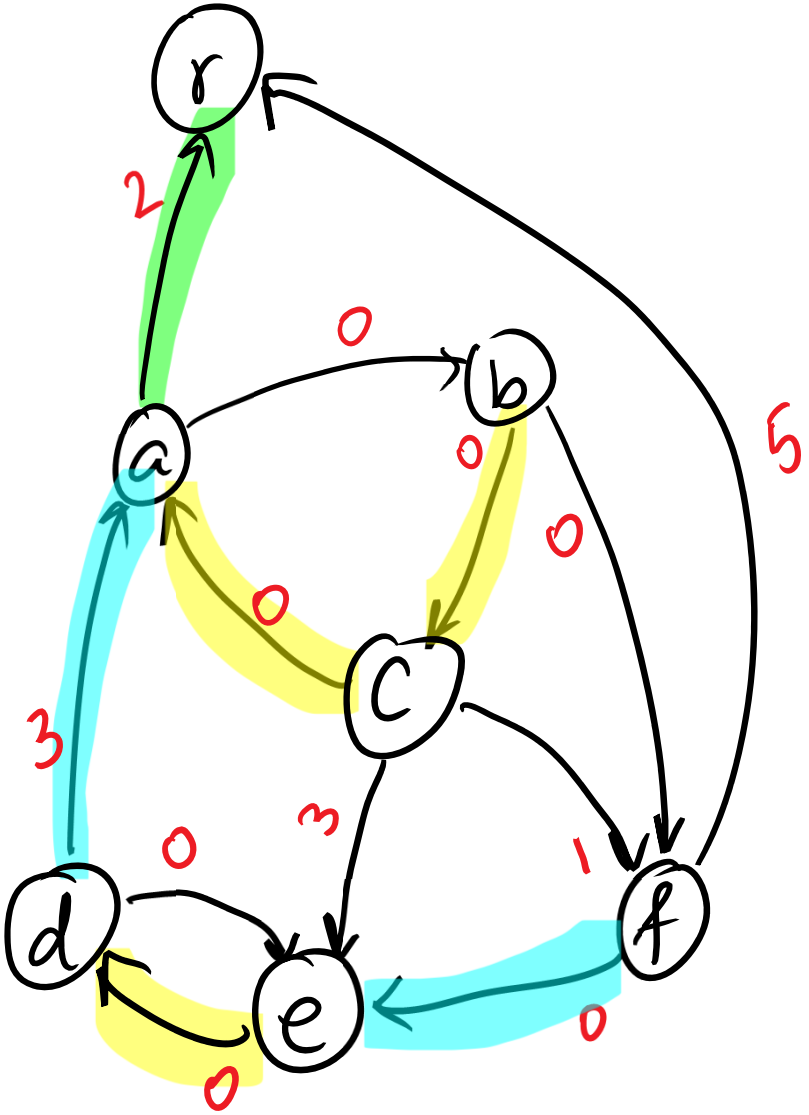
"Lift" solution
from smaller instance
back to larger one

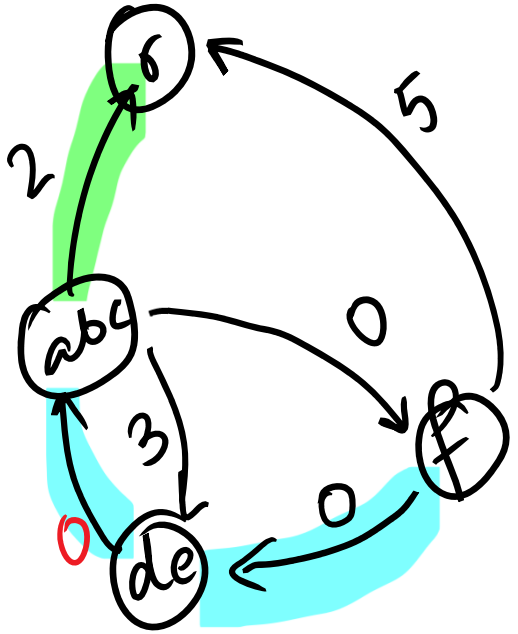


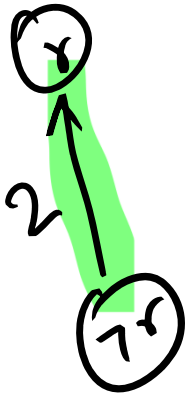




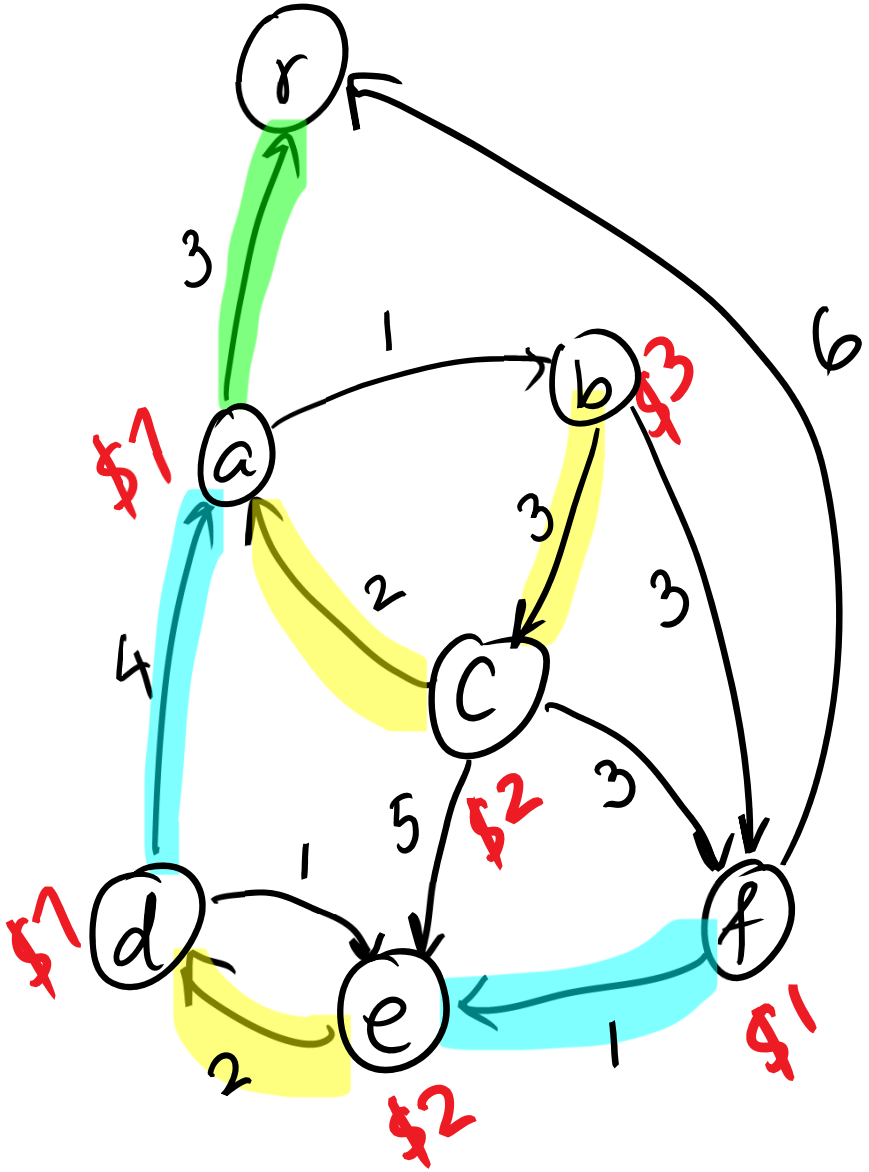
And remove useless zero-cost edge(s) to get back solution



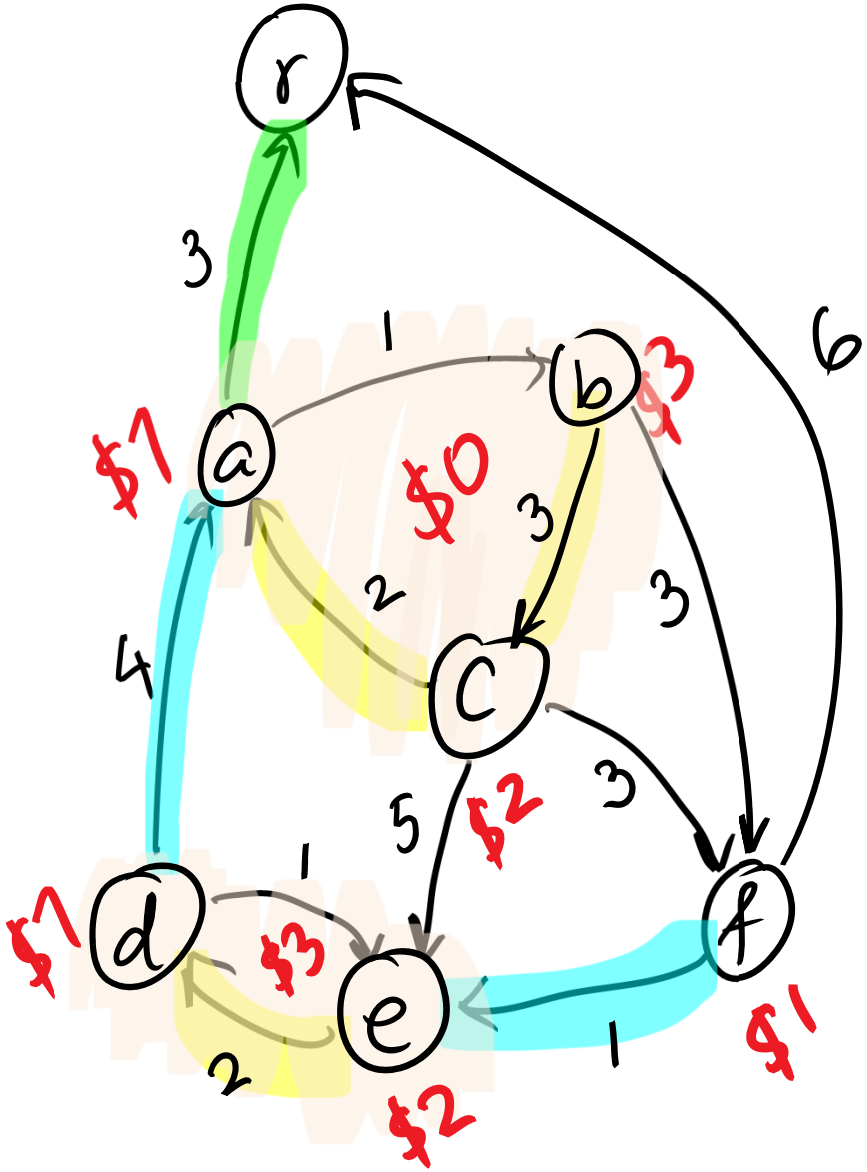


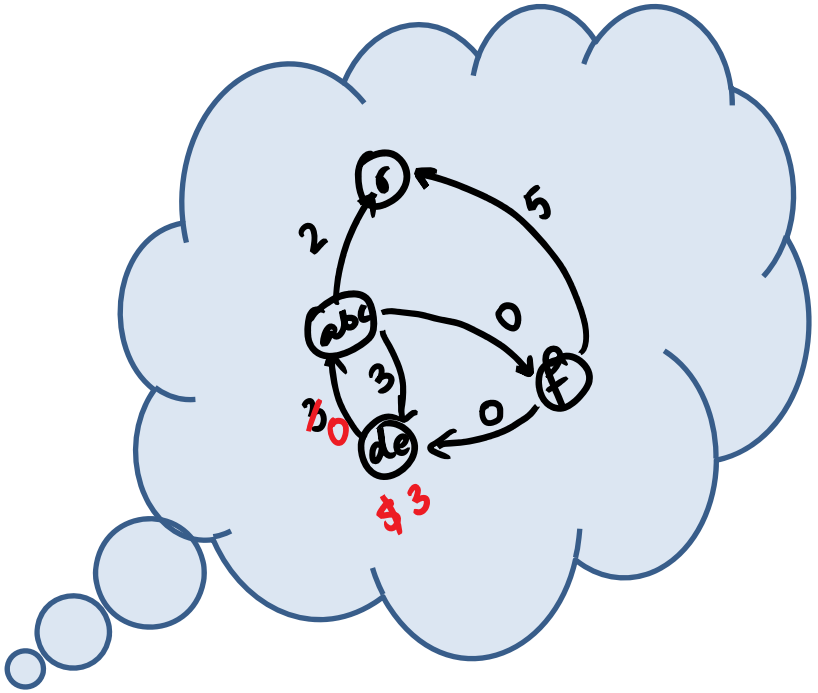


Setting the dual variables a.k.a. “prices”



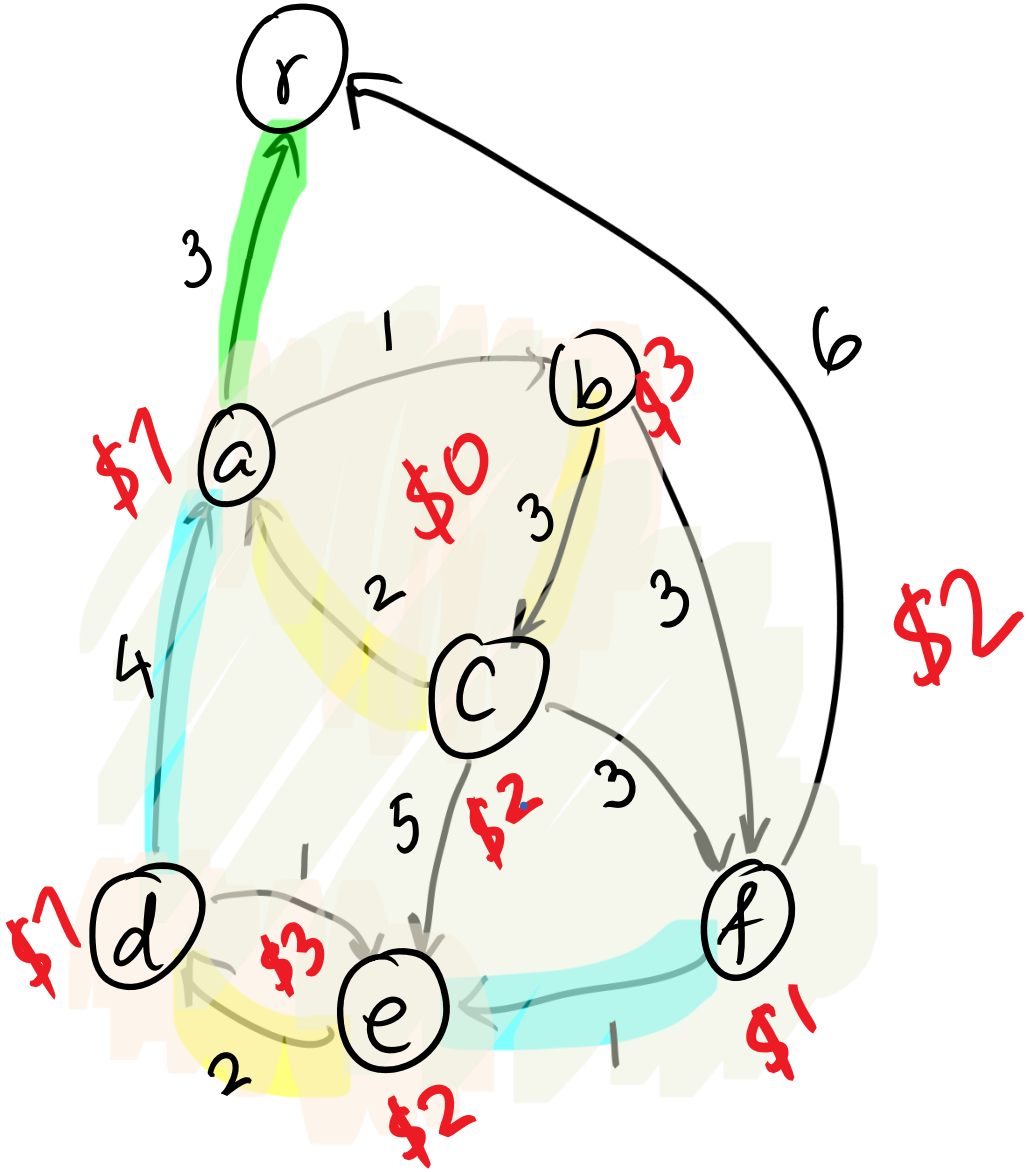
Each node pays cost of cheapest arc leaving it





And now each zero-cost cycle pays for the cheapest arc leaving it

(in graph with reduced costs)



Cost = 15

= total payments