
- Analysis

Given the Network,
Find its Performance

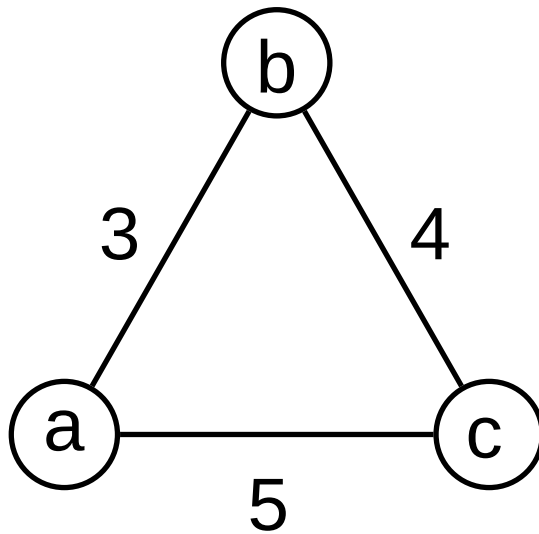
- Synthesis

Create the Network
to meet the Goals

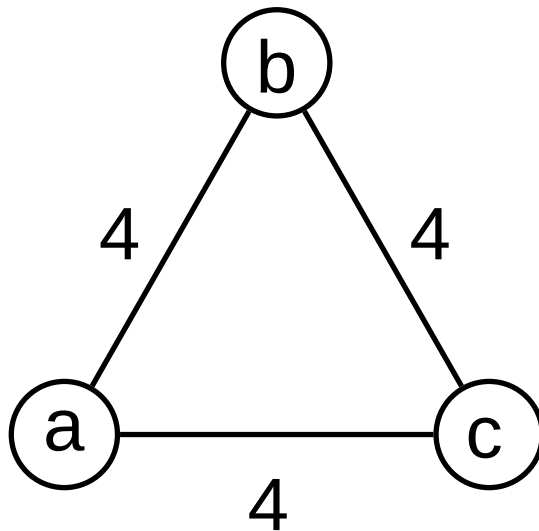
Given the Requirements

$$R(a, b) \geq 6, \quad R(b, c) \geq 7$$

$$R(a, c) \geq 8$$

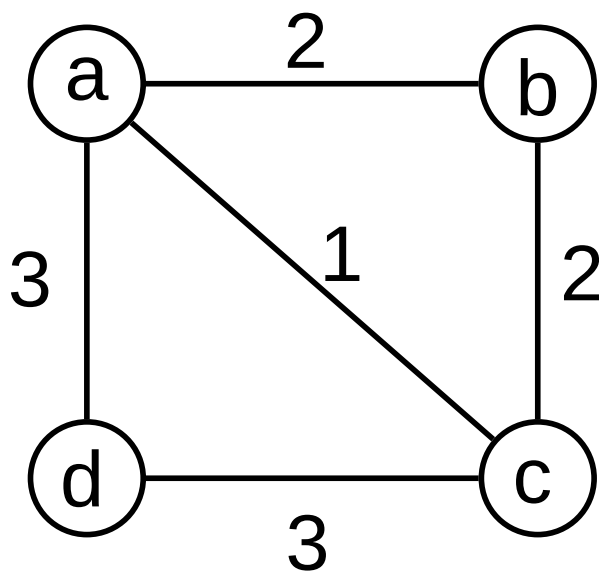
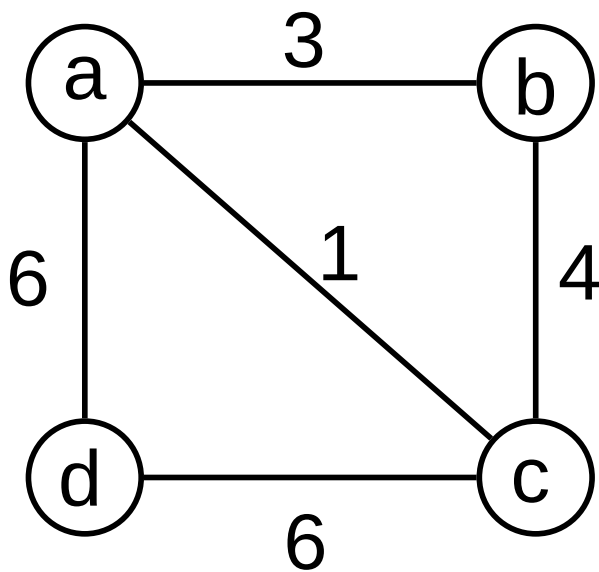


$$\sum b_{ij} = 12$$



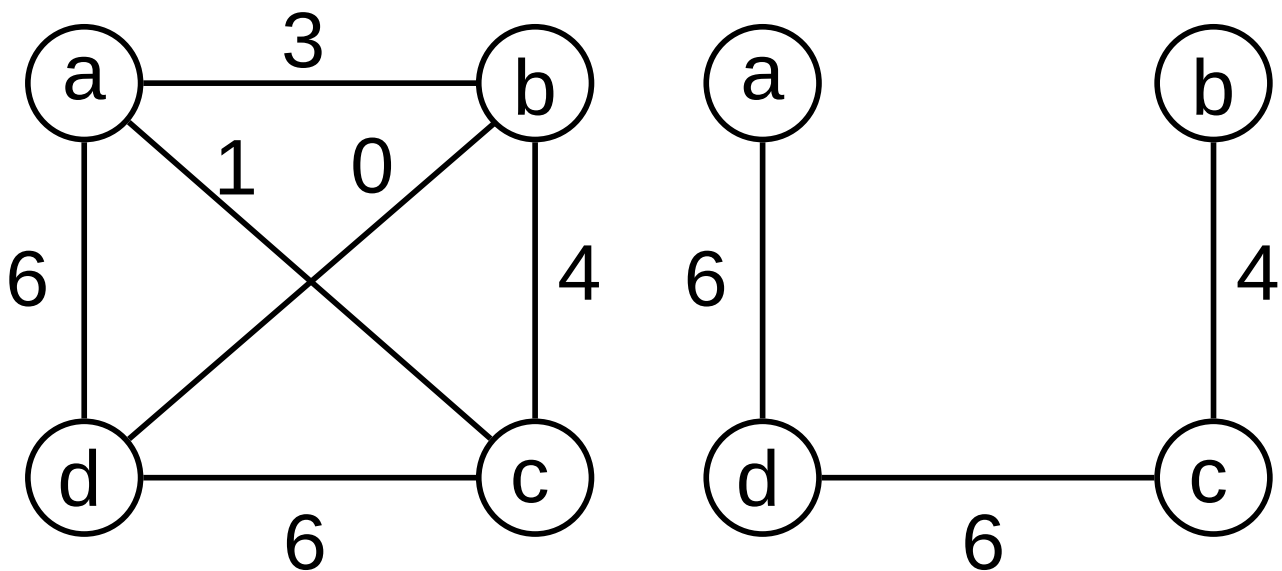
$$\sum b_{ij} = 12$$

R_{ij}



$$\sum b_{ij} = 11$$

Given $n(n - 1)/2$ requirements, a subset of requirements called dominant R_{ij}



dominant R_{ij}

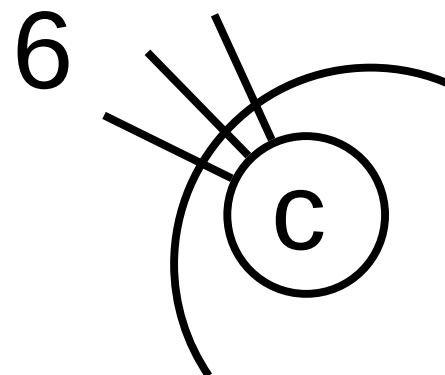
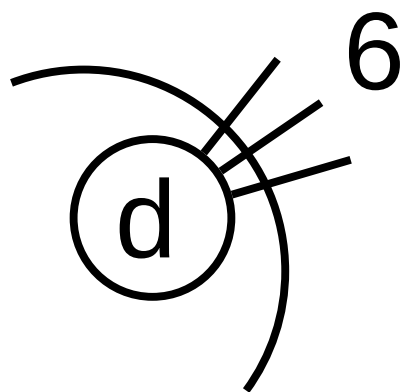
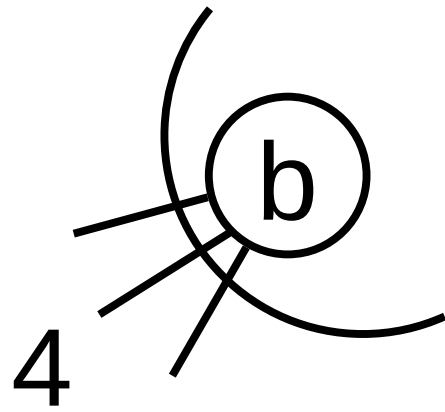
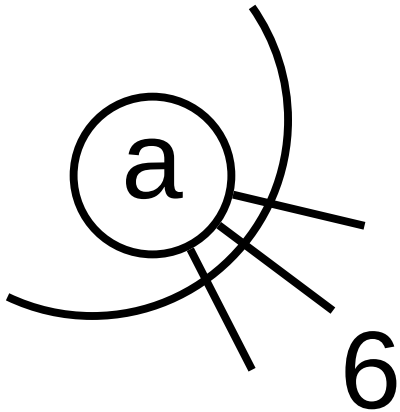
If $F(i, j) \geq \underline{R_{ij}}$,

then $F(i, j) \geq \text{all } R_{ij}$

To find the $\underline{R_{ij}}$ get the Max

Spanning tree from $n(n - 1)/2$

R_{ij}

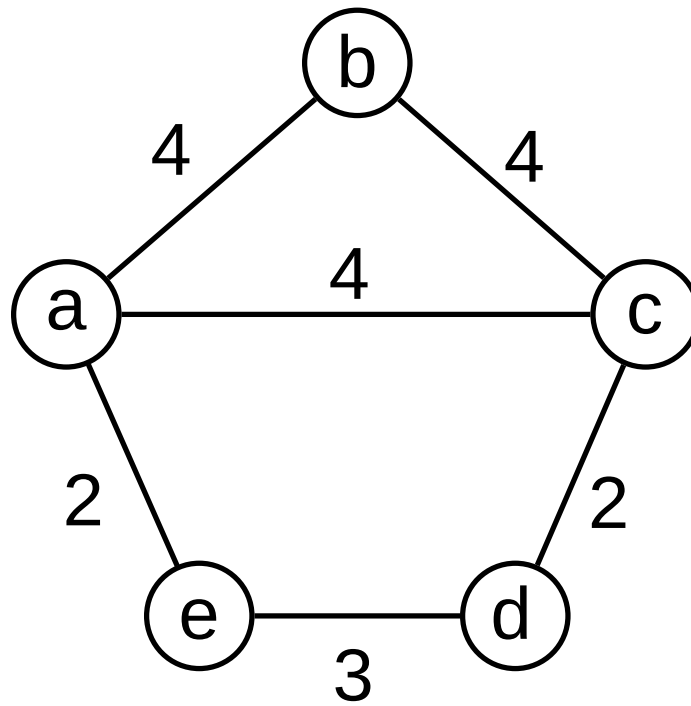


We need at least

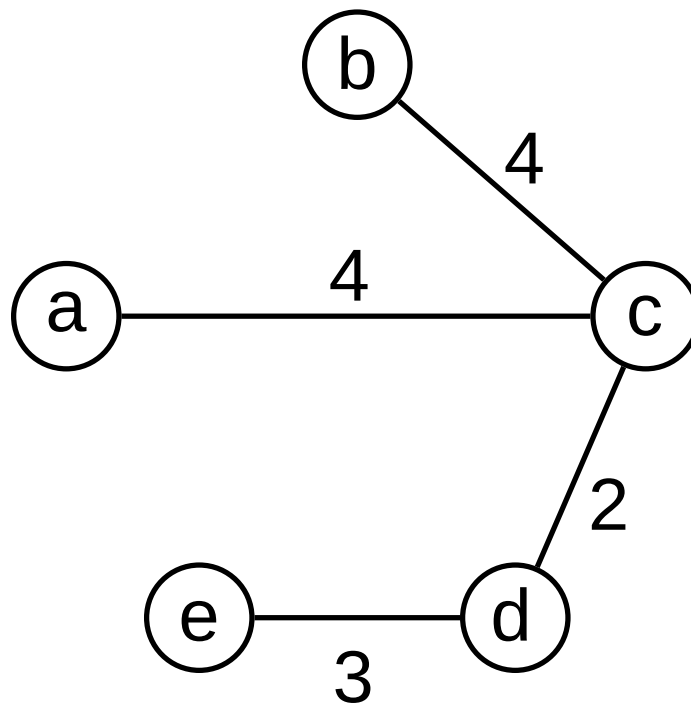
$$(6 + 6 + 6 + 4) / 2 = 11$$

Design Procedures

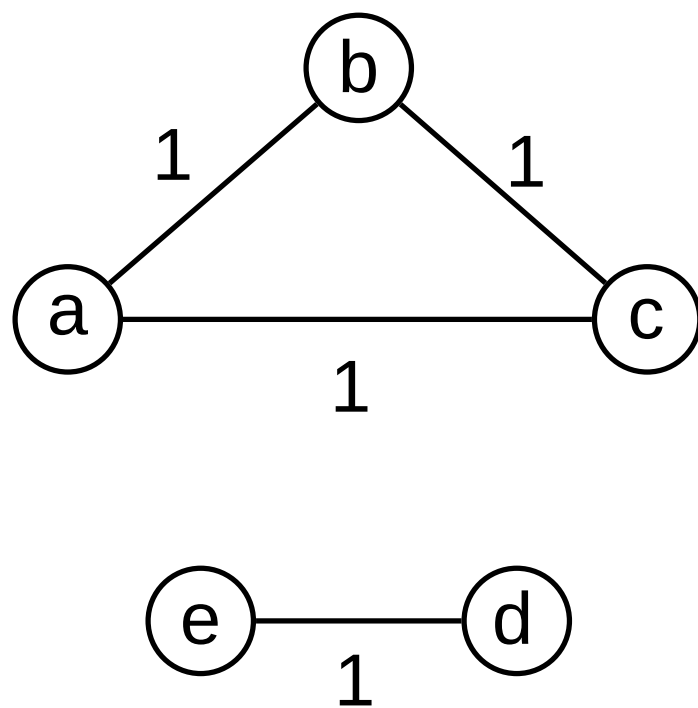
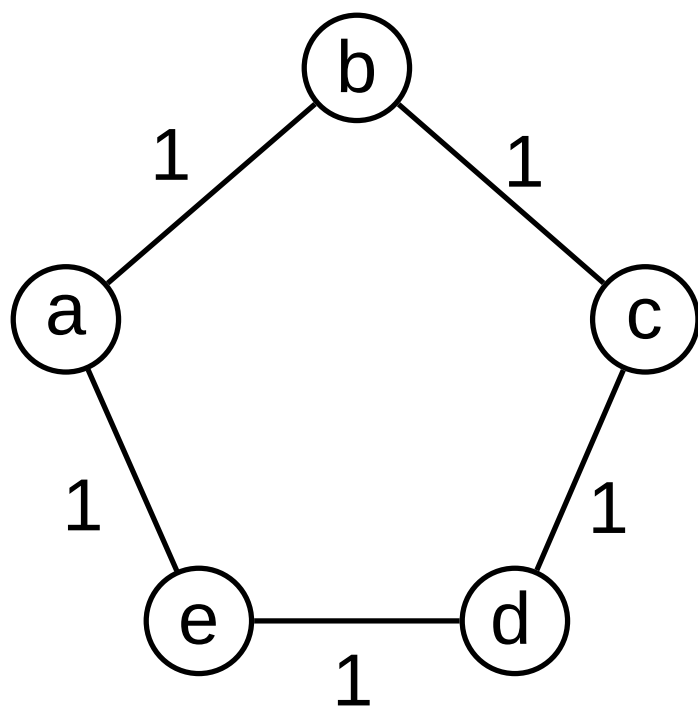
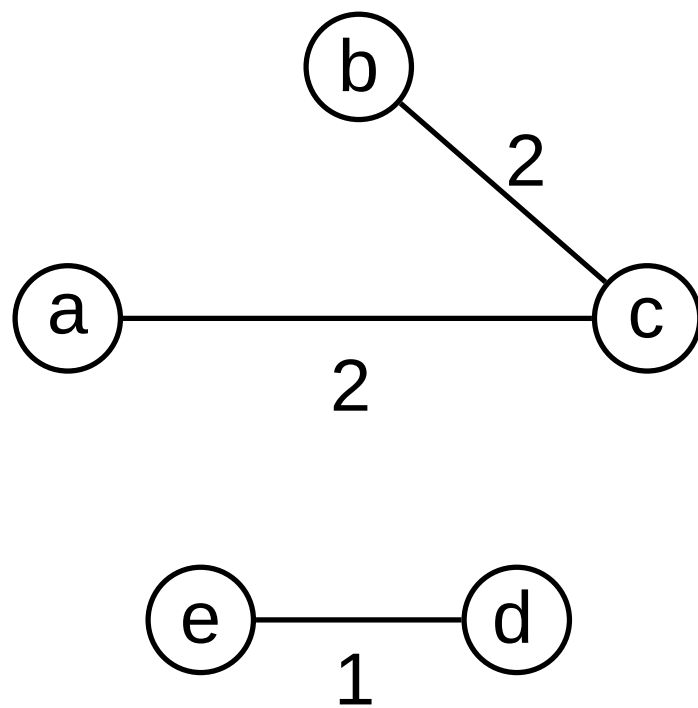
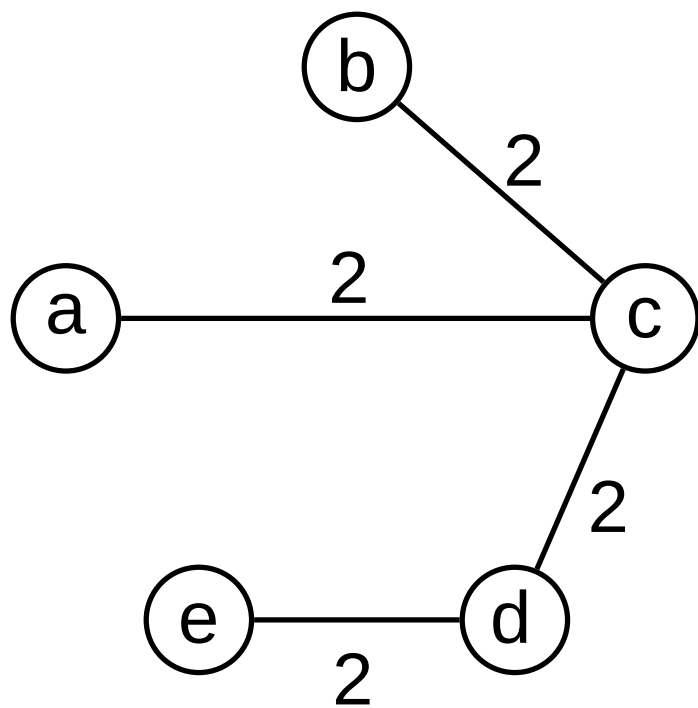
- Get dominant R_{ij} which is a Max Spanning tree
- Decompose the tree into uniform subtrees
- Each subtree is synthesized by a loop, then add

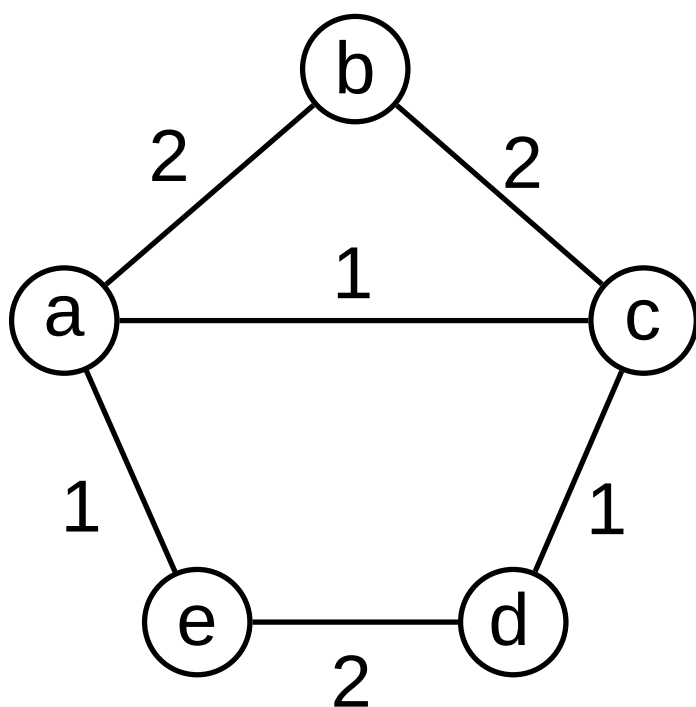


R_{ij}

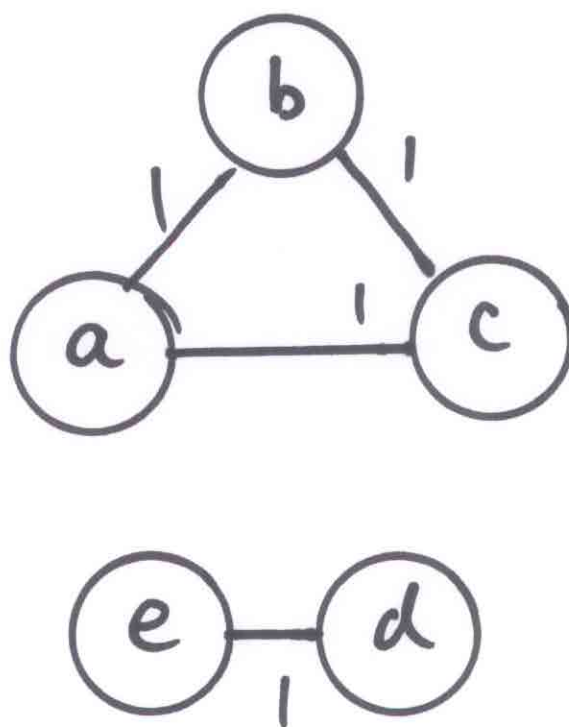
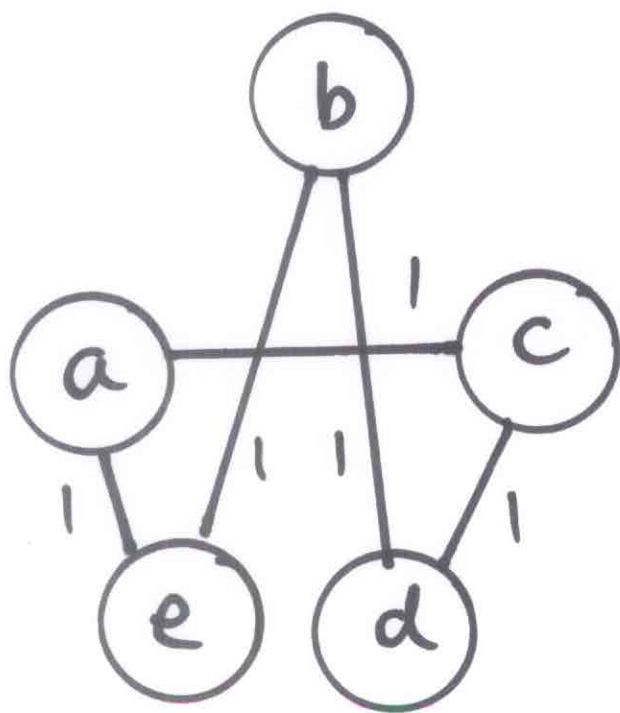
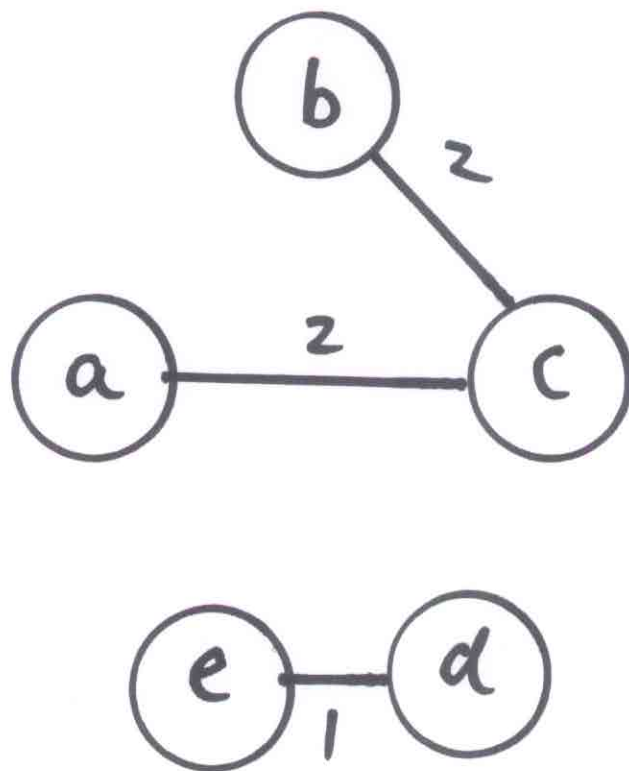
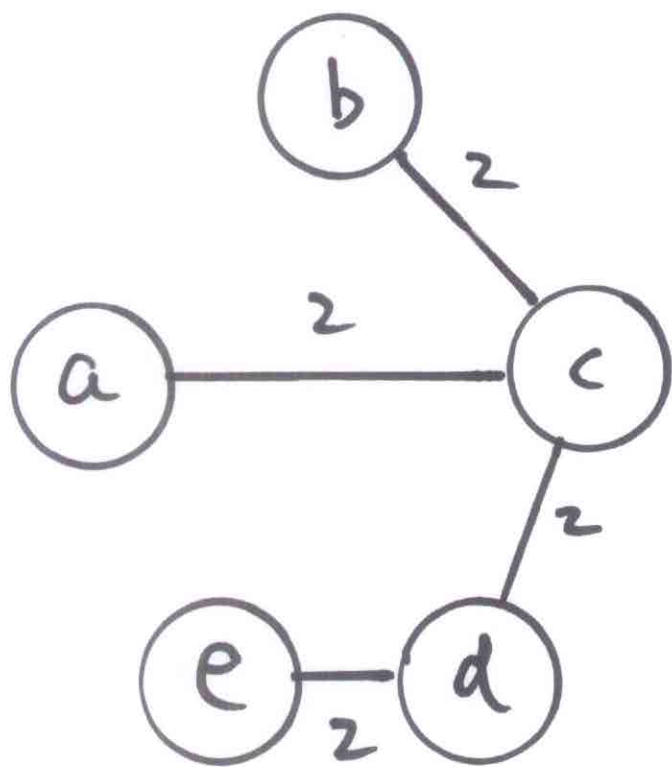


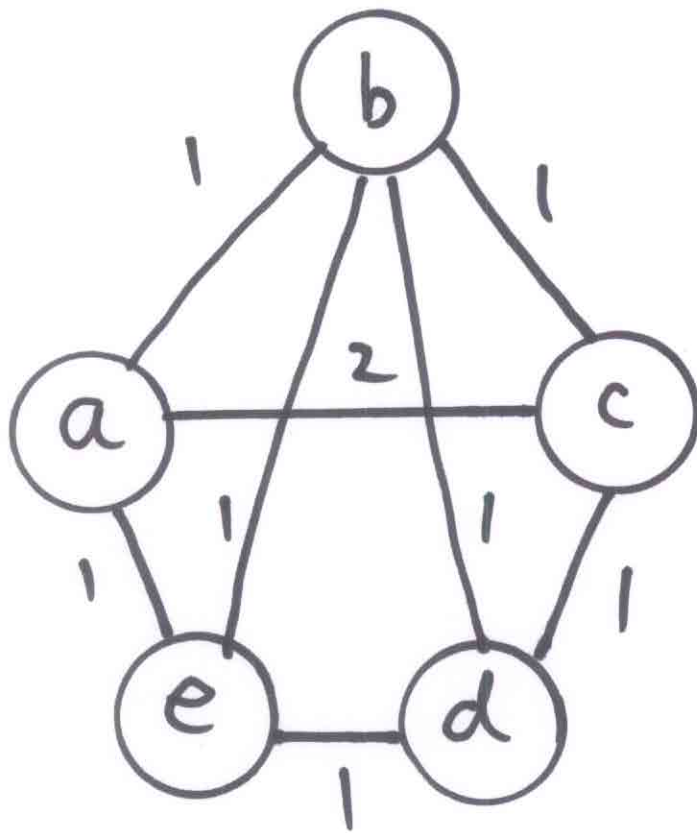
R_{ij}





$$\sum b_{ij} = 9$$





$$\sum b_{ij} = 9$$

$$F(c, d) = 3$$

$$F(a, e) = 3$$

A best way to loop?

An exact way to loop?

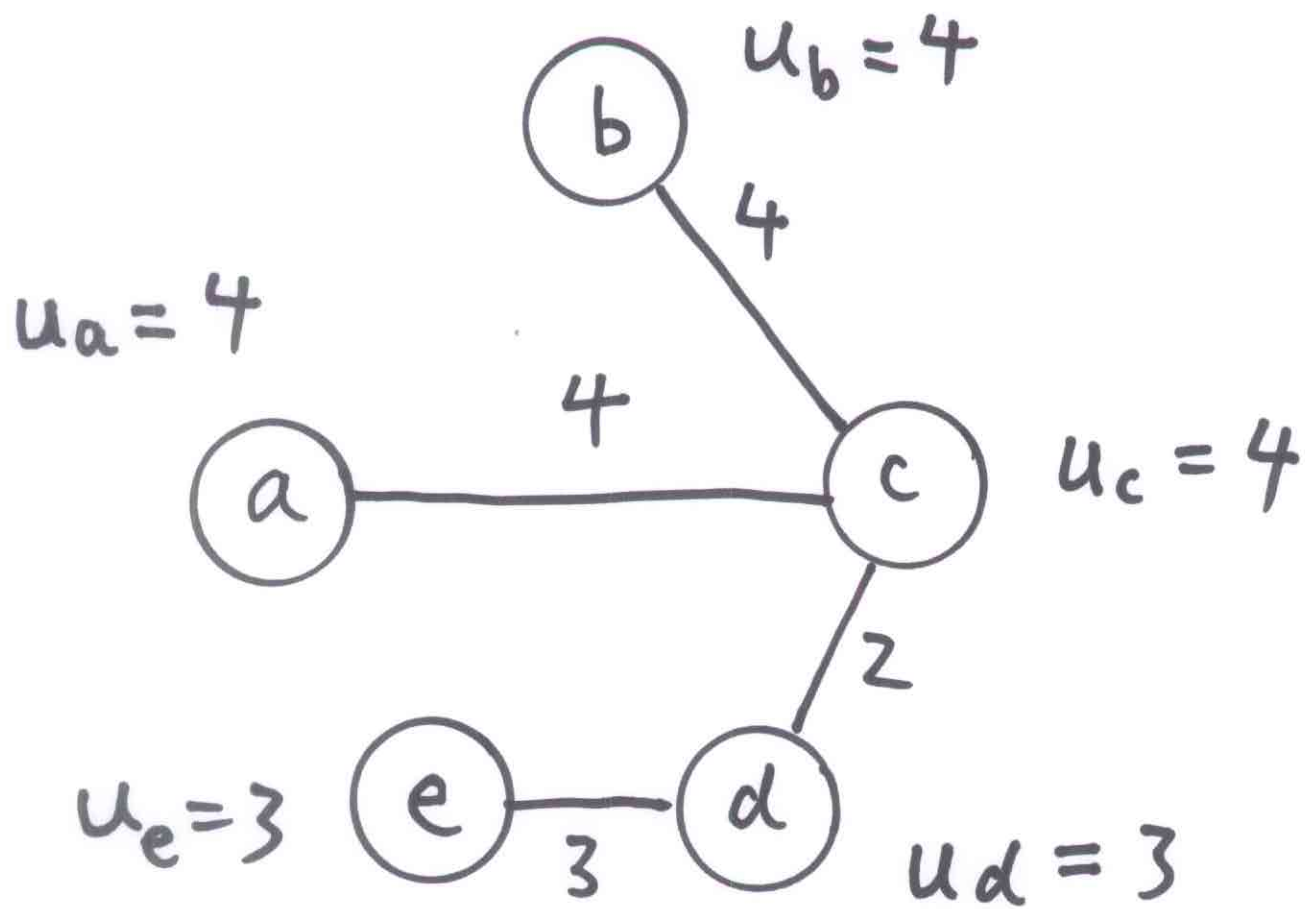
Is there a Superway to

get MAX Flows for all

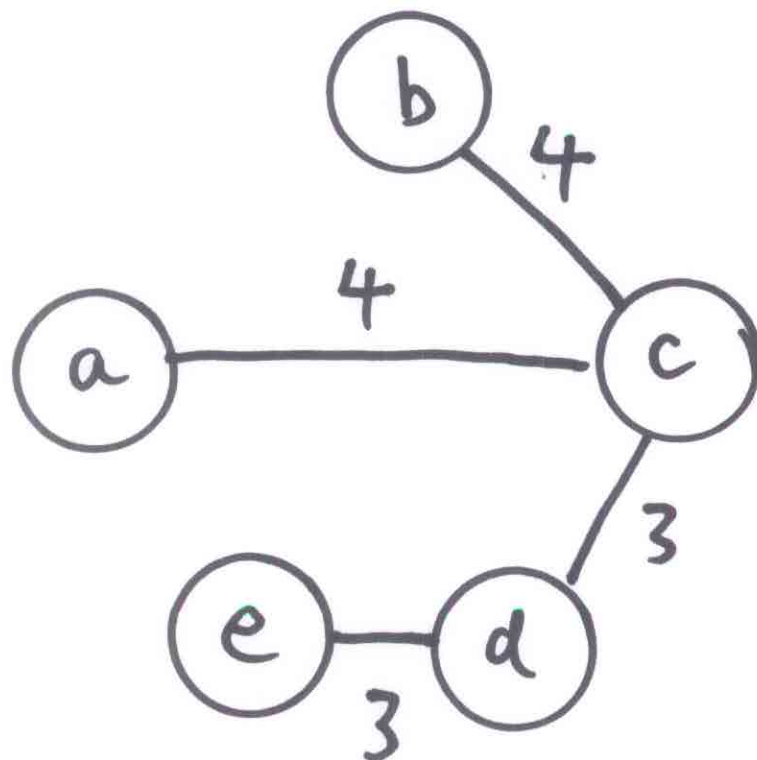
pairs & with min $\sum b_{ij}$?

Super Design Procedure

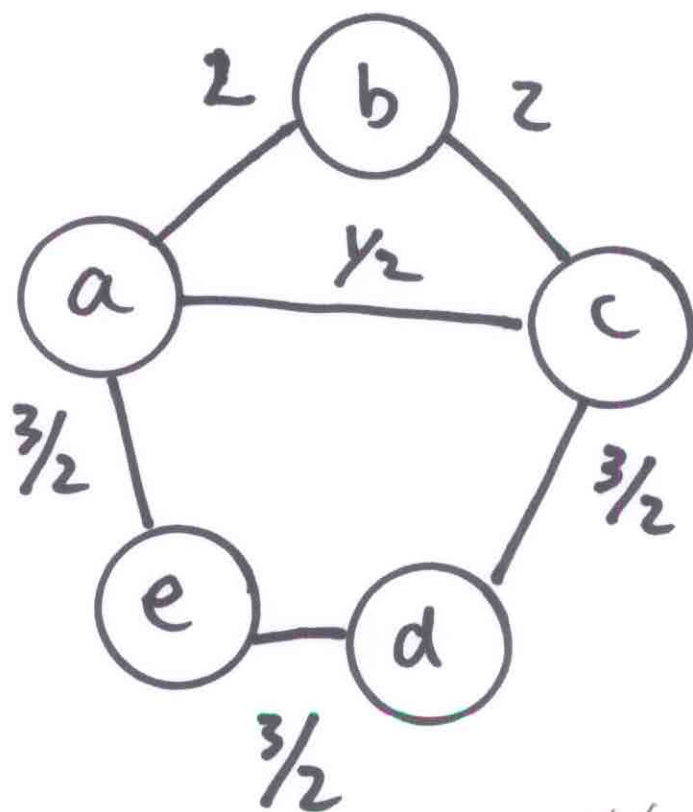
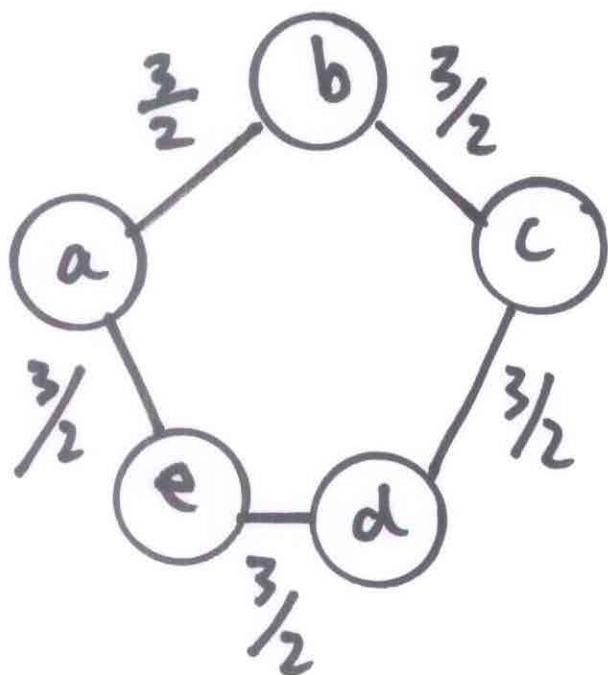
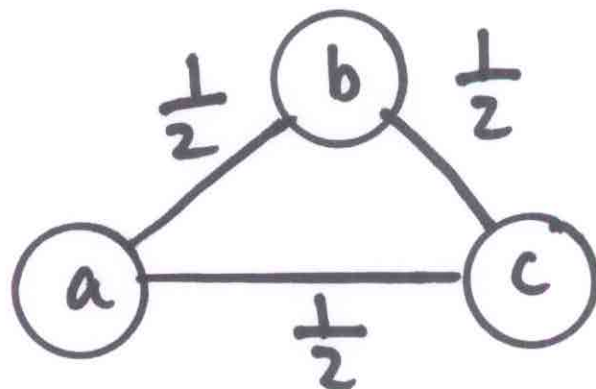
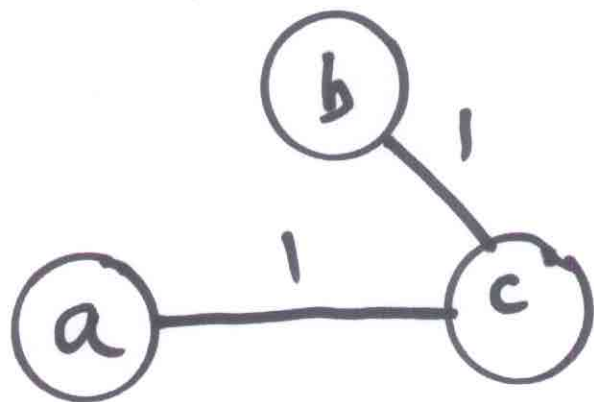
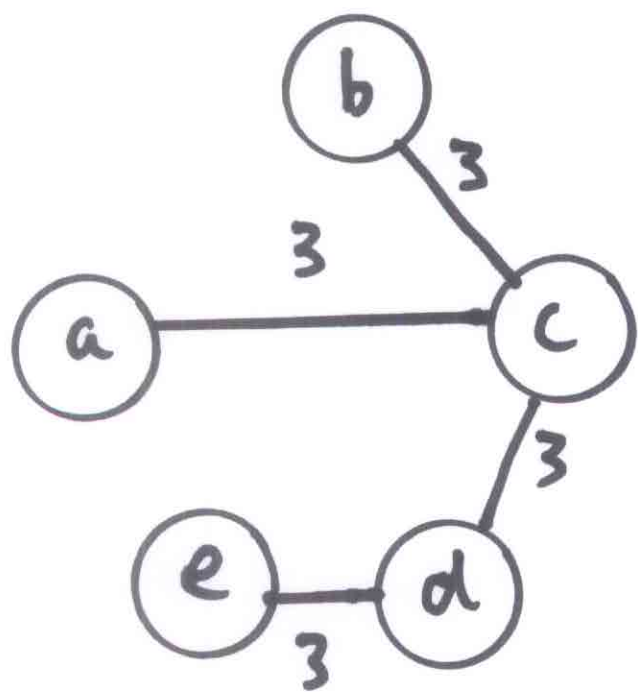
- From dominant R_{ij} ,
Max Spanning Tree
- Increase links of MST
if $\text{Min}(u_i, u_j) > R_{ij}$
- Use Modified MST
to design as before



Modified MAX Spanning Tree



15/19



EXACT R_{ij}

