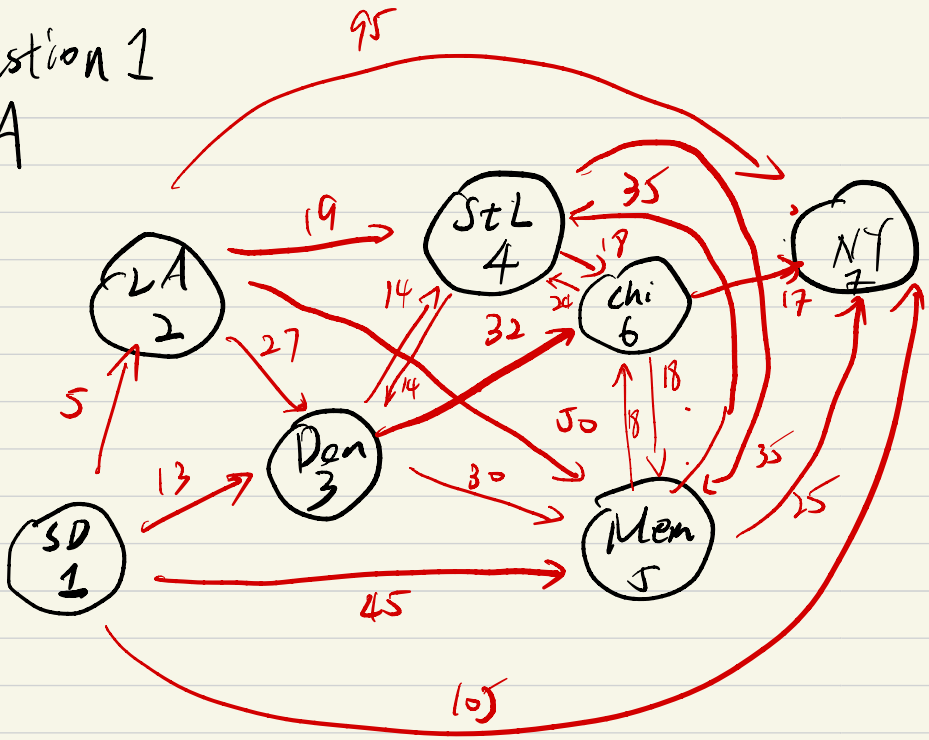
Question 1

A



B

$G(V, E)$

$V = [1, \cdots 7]$ $\forall i \in V$

$E = [(1,2), (1,3) \cdots (6,7)]$

$\forall (i,j) \in E$ Define X_{ij}, C_{ij}

$$\text{Min}: \sum_{(i,j)\in E} C_{ij} X_{ij}$$

$$\text{S.t.}: \forall i \in V, \sum_{(j,i)\in E} X_{ji} - \sum_{(i,j)} X_{ij} = \begin{cases} -1 & \text{for node 1} \\ 0 & \text{for node 2-6} \\ 1 & \text{for node 7} \end{cases}$$

$X_{ij} \geq 0$

Question 2

A: $G(V, E)$

$V = [1, \cdots 7]$

$E = [(1,3), (1,4), \cdots (6,7)]$

$\forall (i,j) \in E$ $\quad \forall i \in V$

Define X_{ij}, C_{ij} cost $\quad D_i$ supply / demand

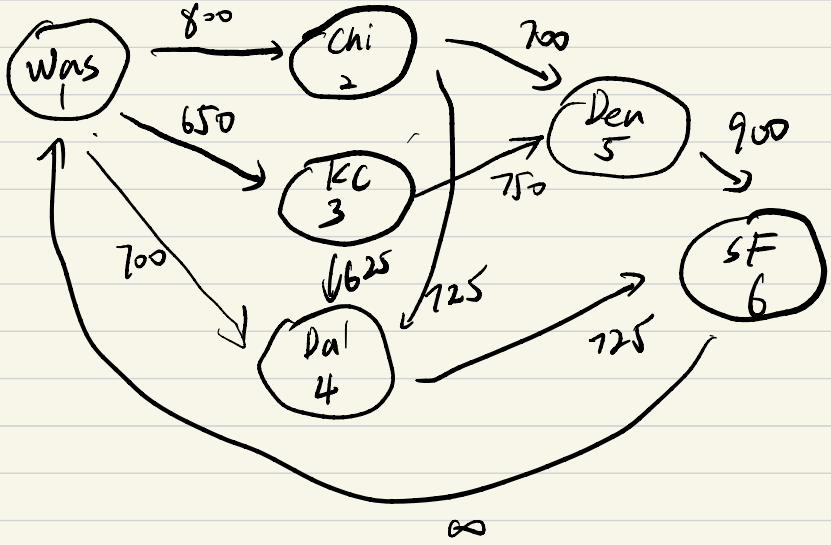
$$\text{Min} = \sum_{(i,j) \in E} C_{ij} X_{ij}$$

$$\text{s.t.} \sum_{(j,i) \in E} X_{ji} - \sum_{(i,j)} X_{ij} \geq D_i$$

$$X_{ij} \geq 0$$

Question 3

A



B $G(V, E)$

$V = [1, \ldots 6]$

$E = [(1,2), (1,3), \ldots (6,1)]$

$\forall (i,j) \in E$

Define X_{ij}, C_{ij} cost

$$\text{Max} \quad X_{61}$$

$$\text{s.t.} \ \forall (i,j) \in E$$

$$\sum_{(j,i)} X_{ji} - \sum_{(i,j)} X_{ij} = 0$$

$$0 \le X_{ij} \le C_{ij}$$