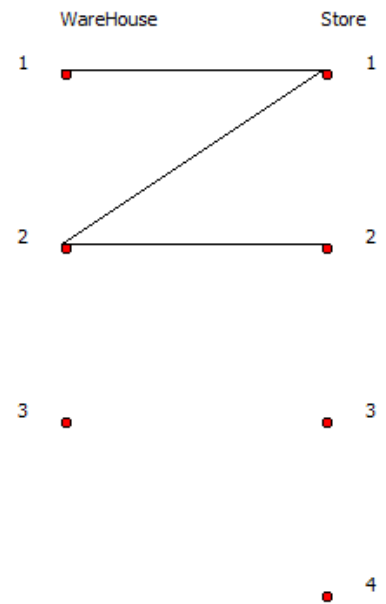
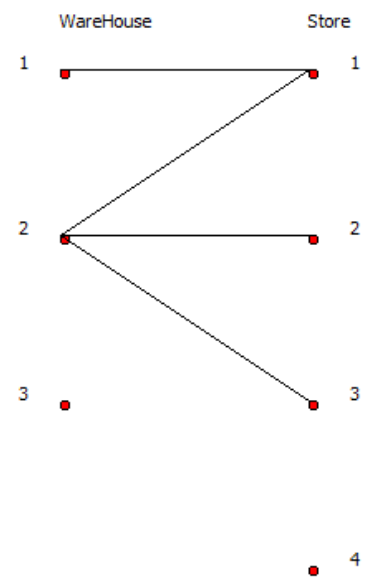


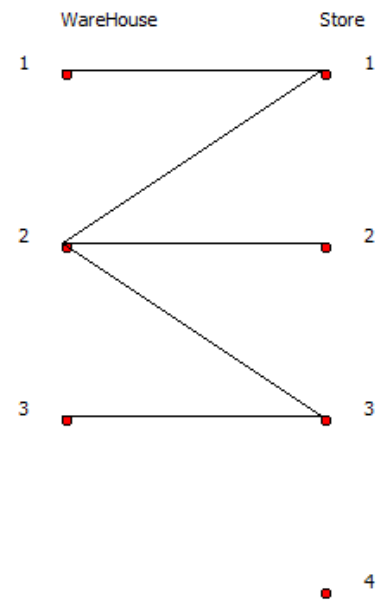
8 40	3 0	2 0	0 0	40
3 10	5 10	7 0	0 0	30
6 0	4 0	5 0	0 0	50
50	10	40	20	



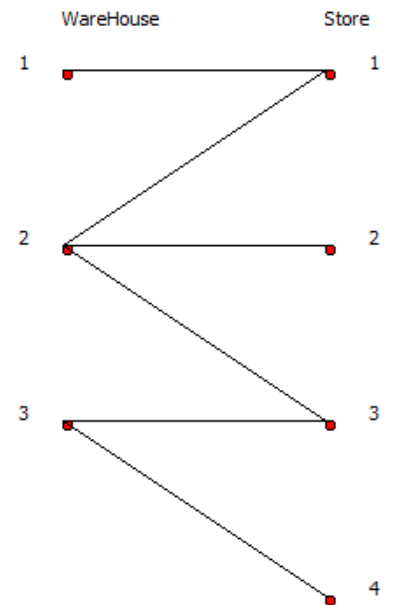
8 40	3 0	2 0	0 0	40
3 10	5 10	7 10	0 0	30
6 0	4 0	5 0	0 0	50
50	10	40	20	



8 40	3 0	2 0	0 0	40
3 10	5 10	7 10	0 0	30
6 0	4 0	5 30	0 0	50
50	10	40	20	



8 40	3 0	2 0	0 0	40
3 10	5 10	7 10	0 0	30
6 0	4 0	5 30	0 20	50
50	10	40	20	

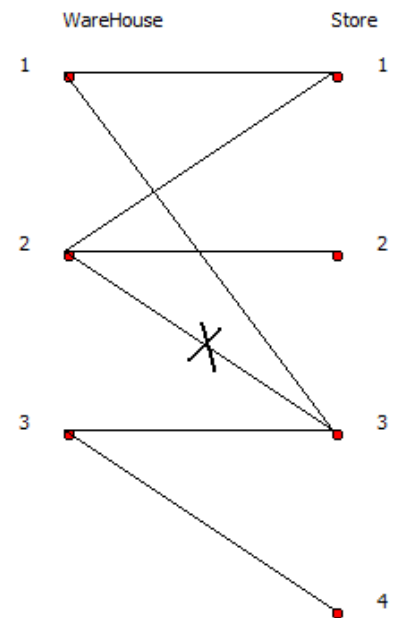


Total cost (by NWCST method) = 620\$

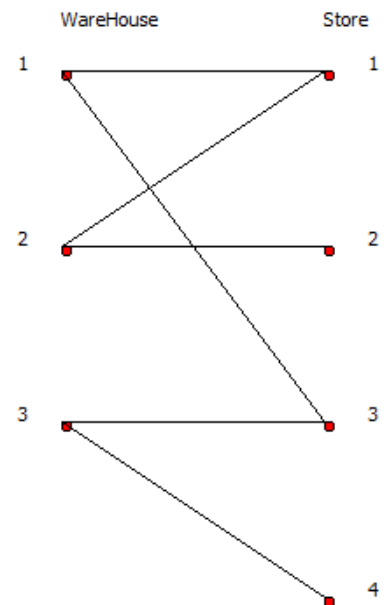
$u_1: 10 \quad v_1: 18$
 $u_2: 15 \quad v_2: 20$
 $u_3: 17 \quad v_3: 22$
 $v_4: 17$

$c_{12}: 3 \quad v_2 - u_1: 10 \Rightarrow \text{decrease of } \7
 $c_{13}: 2 \quad v_3 - u_1: 12 \Rightarrow \text{decrease of } \10
 $c_{14}: 0 \quad v_4 - u_1: 7 \Rightarrow \text{decrease of } \7
 $c_{24}: 0 \quad v_4 - u_2: 2 \Rightarrow \text{decrease of } \2
 $c_{31}: 6 \quad v_1 - u_3: 1 \Rightarrow \text{decrease of } \-5
 $c_{32}: 4 \quad v_2 - u_3: 3 \Rightarrow \text{decrease of } \-1

	8	3	2	0	
-10					
40		0	0	+10	40
	3	5	7	0	
+10					
10		10	10	0	30
	6	4	5	0	
0					
	0		30	20	50
50	10	40	20		



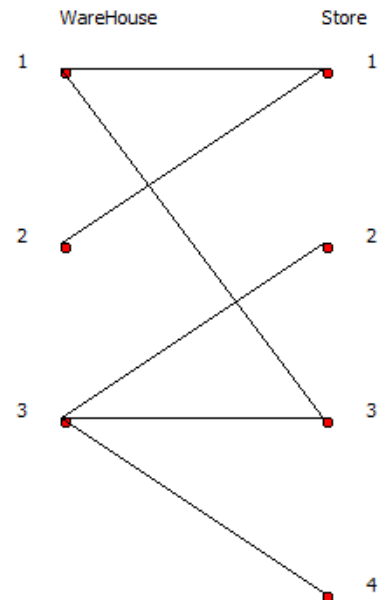
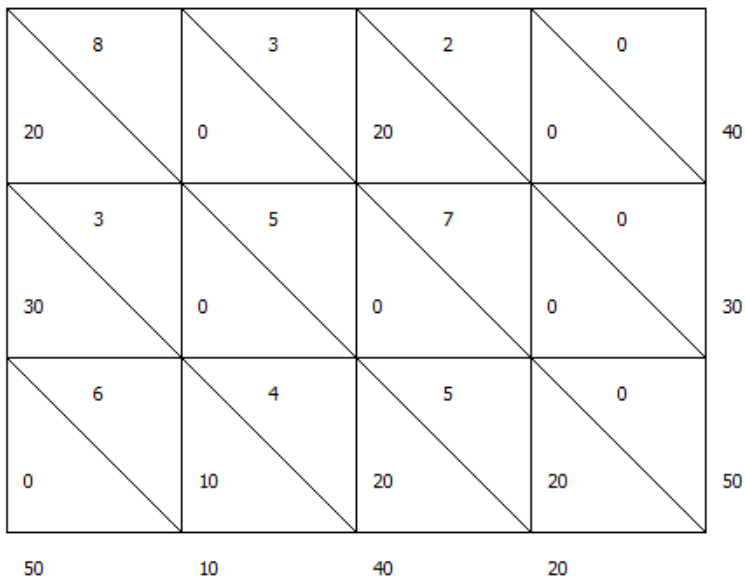
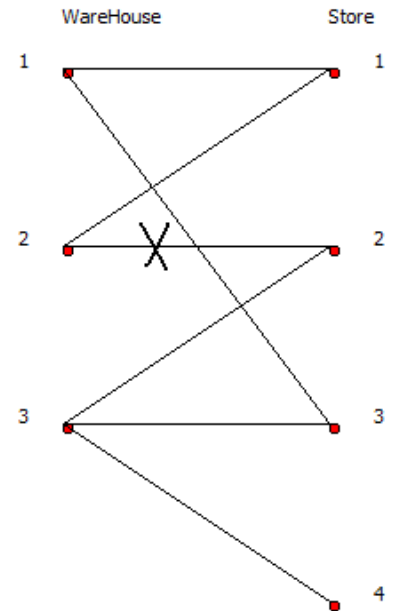
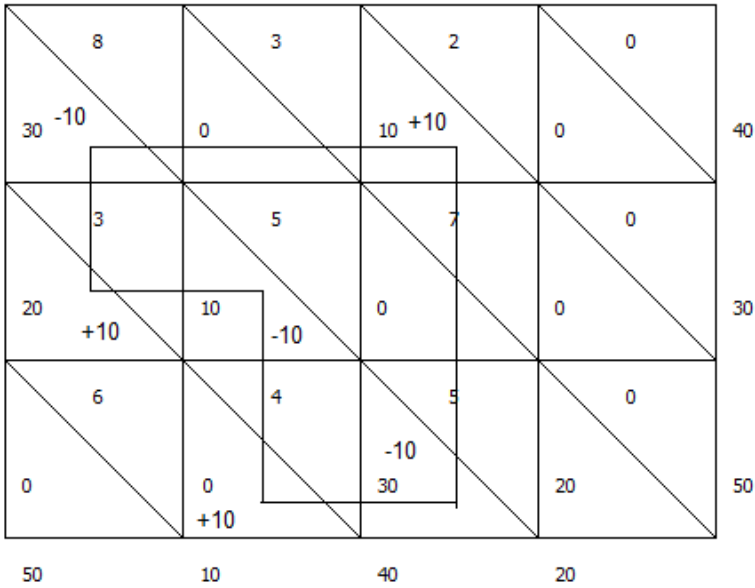
	8	3	2	0	
30					
	0		10	0	40
	3	5	7	0	
20					
	10	0	0	0	30
	6	4	5	0	
0					
	0		30	20	50
50	10	40	20		



Total cost = 520

$u_1: 10 \ v_1: 18$
 $u_2: 15 \ v_2: 20$
 $u_3: 7 \ v_3: 12$
 $v_4: 7$

$c_{12}: 3 \ v_2 - u_1: 10 \Rightarrow$ decrease of \$7
 $c_{14}: 0 \ v_4 - u_1: -3 \Rightarrow$ decrease of \$ -3
 $c_{23}: 7 \ v_3 - u_2: -3 \Rightarrow$ decrease of \$ -10
 $c_{24}: 0 \ v_4 - u_2: -8 \Rightarrow$ decrease of \$ -8
 $c_{31}: 6 \ v_1 - u_3: 11 \Rightarrow$ decrease of \$5
 $c_{32}: 4 \ v_2 - u_3: 13 \Rightarrow$ decrease of \$9

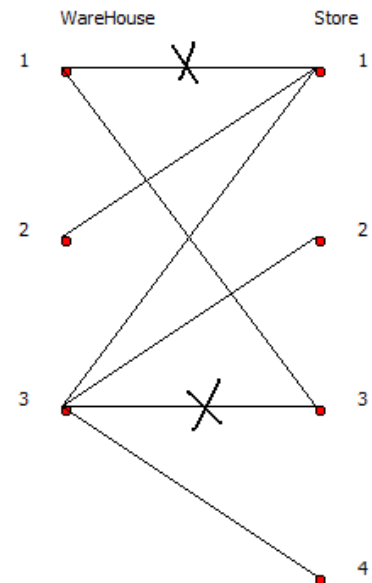


Total cost = 430

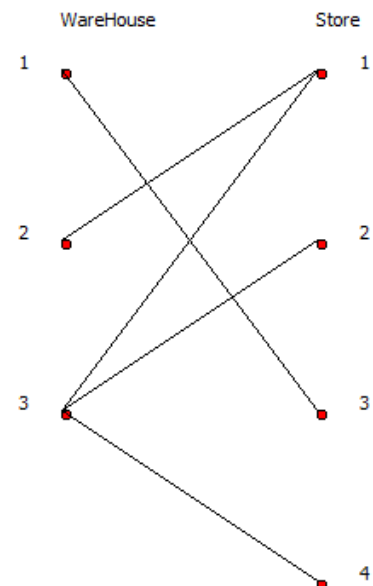
$u_1: 10 \quad v_1: 18$
 $u_2: 15 \quad v_2: 11$
 $u_3: 7 \quad v_3: 12$
 $v_4: 7$

$c_{12}: 3 \quad v_2 - u_1: 1 \Rightarrow \text{decrease of \$ } -2$
 $c_{14}: 0 \quad v_4 - u_1: -3 \Rightarrow \text{decrease of \$ } -3$
 $c_{22}: 5 \quad v_2 - u_2: -4 \Rightarrow \text{decrease of \$ } -9$
 $c_{23}: 7 \quad v_3 - u_2: -3 \Rightarrow \text{decrease of \$ } -10$
 $c_{24}: 0 \quad v_4 - u_2: -8 \Rightarrow \text{decrease of \$ } -8$
 $c_{31}: 6 \quad v_1 - u_3: 11 \Rightarrow \text{decrease of \$ } 5$

	8	3	2	0	
-20					
20		0	20		40
			+20		
	3	5	7	0	
30		0	0	0	30
	6	4	5	0	
0	+20	10	20	-20	50
50	10	40	20		



	8	3	2	0	
0		0	40	0	40
	3	5	7	0	
30		0	0	0	30
	6	4	5	0	
20		10	0	20	50
50	10	40	20		



Total cost = 330

The graph has become disconnected (forest),
start with $u_1 = 10$ from one component and
 $u_2 = 10$ from another (tree).

$u_1: 10$	$v_1: 13$
$u_2: 10$	$v_2: 11$
$u_3: 7$	$v_3: 12$
$v_4: 7$	

$c_{11}: 8, v_1 - u_1: 3 \Rightarrow$ decrease of \$-5
$c_{12}: 3, v_2 - u_1: 1 \Rightarrow$ decrease of \$-2
$c_{14}: 0, v_4 - u_1: -3 \Rightarrow$ decrease of \$-3
$c_{22}: 5, v_2 - u_2: 1 \Rightarrow$ decrease of \$-4
$c_{23}: 7, v_3 - u_2: 5 \Rightarrow$ decrease of \$-2
$c_{24}: 0, v_4 - u_2: -3 \Rightarrow$ decrease of \$-3
$c_{33}: 5, v_3 - u_3: 5 \Rightarrow$ decrease of \$0

Optimal solution!!!

Optimal cost = 330\$