Resource Allocation problem:

	Estimated profit of store 1	2	3	4
0	0	0	0	0
1	4	2	6	2
2	6	4	8	3
3	7	6	8	4
4	7	8	8	4
5	7	9	8	4
6	7	10	8	4

Stage I : store 1

Stage II : store 1+2

Stage III : store 1+2+3

Stage IV : store 1+2+3+4

Let x_1, x_2, x_3 and x_4 are the number of crates (boxes) allocated to store 1, store 2, store 3 and store 4 respectively.

$f_1(x_1)$, $f_2(x_2)$, $f_3(x_3)$ and $f_4(x_4)$ are respective profit from stores.

$$\text{Max } z = f_1(x_1) + f_2(x_2) + f_3(x_3) + f_4(x_4)$$

s.t.

$$x_1 + x_2 + x_3 + x_4 \leq 6$$

$$x_1, x_2, x_3, x_4 \geq 0.$$

Stage I : Store 1

x_1	0	1	2	3	4	5	6
$f_1(x_1)$	0	4	6	7	7	7	7

Stage 2 : Store 1 + Store 2

Store 1 →	x_1	0	1	2	3	4	5	6
	$f_1(x_1)$	0	4	6	7	7	7	7

Store 2 ↓ | $f_1(x_1) + f_2(x_2)$

x_2	$f_2(x_2)$							
0	0	0	4	6	7	7	7	7
1	2	2	6	8	9	9	9	–
2	4	4	8	10	11	11	–	–
3	6	6	10	12	13	–	–	–
4	8	8	12	14	–	–	–	–
5	9	9	13					
6	10	10						

Stage 3 : (Store 1 + Store 2) + Store 3

No. of Boxes	0	1	2	3	4	5	6
Max of $f_1(x_1) + f_2(x_2)$	0	4	6	8	10	12	14
Boxes in Store 1 + Store 2	0+0	1+0	2+0 1+1	2+1 1+2	2+2 1+3	2+3 1+4	2+4

Store 3 ↓ | Max of $[f_1(x_1) + f_2(x_2)] + f_3(x_3)$

x_3	$f_3(x_3)$							
0	0	0	4	6	8	10	12	14
1	6	6	10	12	14	16	18	–
2	8	8	12	14	16	18	–	–
3	8	8	12	14	–	–	–	–
4	8	8	12	–	–	–	–	–
5	8	8						
6	8	8						

No. of boxes	0	1	2	3	4	5	6
Max of $f_1(x_1) + f_2(x_2) + f_3(x_3)$	0	6	10	12	14	16	18
Boxes in Store (1+2+3)	0+0+0	0+0+1	1+0+1	2+0+1 1+1+1 1+0+2	2+2+1 1+3+1 2+1+2 1+2+2	2+1+1 1+2+1 2+0+2 1+1+2	2+3+1 1+4+1 2+2+2 1+3+2
Boxes in Store 4	6	5	4	3	2	1	0
$f_4(x_4)$	4	4	4	4	3	2	0
$f_1(x_1) + f_2(x_2) + f_3(x_3) + f_4(x_4)$	4	10	14	16	17	(18)	(18)

Maximum profit is 18 and possible optimal allocations are:

Store 1	Store 2	Store 3	Store 4
2	2	1	1
1	3	1	1
2	1	2	1
1	2	2	1
2	3	1	0
1	4	1	0
2	2	2	0
1	3	2	0