

Example : close loop 优化 optimal

| | 1 | 2 | 3 | 4 | Supply | u_i |
|--------|------------------|-------------------|-------------------|-------------------|--------|-------|
| 1 | ¹⁰ 6 | ⁵ 8 | ¹ (10) | ⁵ -3 | 10 | -5 |
| 2 | ² (8) | ⁵ 10 | ⁷ 8 | ⁶ (7) | 15 | -7 |
| 3 | ¹² 3 | ² (20) | ⁶ (2) | ¹³ (3) | 25 | (0) |
| Demand | 8 | 20 | 12 | 10 | | |
| v_j | 9 | 2 | 6 | (13) | | |

Solution ① loop + 1 2 3 4 ...

| | 1 | 2 | 3 | 4 | Supply | u_i |
|--------|------------------|-------------------|-------------------|-------------------|--------|-------|
| 1 | ¹⁰ 6 | ⁵ 8 | ¹ (10) | ⁵ -3 | 10 | -5 |
| 2 | ² (8) | ⁵ 10 | ⁷ 8 | ⁶ (7) | 15 | -7 |
| 3 | ¹² 3 | ² (20) | ⁶ (2) | ¹³ (3) | 25 | (0) |
| Demand | 8 | 20 | 12 | 10 | | |
| v_j | 9 | 2 | 6 | (13) | | |

② find even position min value

$3 < 10 \Rightarrow \text{min value is } 3$

③ odd position + min value
even - min value

| | 1 | 2 | 3 | 4 | Supply | u_i |
|--------|-----------------|-----------------|------------------------------|------------------------------|--------|-------|
| 1 | ¹⁰ 6 | ⁵ 8 | ¹ 7 ¹⁰ | ⁵ 12 ³ | 10 | -5 |
| 2 | ² 8 | ⁵ 10 | ⁷ 8 | ⁶ 7 | 15 | -7 |
| 3 | ¹² 3 | ² 20 | ⁶ 5 ² | ¹³ 3 | 25 | 0 |
| Demand | 8 | 20 | 12 | 10 | | |
| v_j | 9 | 2 | 6 | 13 | | |

④ result

| | 1 | 2 | 3 | 4 | Supply | u_i |
|--------|----------------|-----------------|----------------|----------------|--------|-------|
| 1 | ¹⁰ | ⁵ | ¹ 7 | ⁵ 3 | 10 | |
| 2 | ² 8 | ⁵ | ⁷ | ⁶ 7 | 15 | |
| 3 | ¹² | ² 20 | ⁶ 5 | ¹³ | 25 | |
| Demand | 8 | 20 | 12 | 10 | | |
| v_j | | | | | | |