

GUROBI SOLVING OF ② - ALTERNATIVE

$C(i, j) \rightarrow$ Completion time of operation i of job j in the sequence

$OR(j) \rightarrow$ 1 if job j patient of schedule occurs in the OR.

$z(s, j) \rightarrow$ Binary, 1 if job j is in s th position of the schedule

$$OF = \min_i C(3, i)$$

$$! S(2, k, j) = \sum_{i=1}^j P(i+1, k) z(i, j) !$$

MODEL:	①	$C(1, 1, 1) - S(1, k, 1) = 0$			Initialization and finalization
	②	$OR(N, j) = 1$			
	③	$\sum_{j=1}^N z(j, j) = 1$	$\forall j$		Only one job per position.
	④	$\sum_{j=1}^N z(j, j) = 1$	$\forall j$		
	⑤	$C(2, j) - S(2, k, j) = C(1, j)$	$\forall j$		No Time Between $A(1), S(2), A(2)$
	⑥	$C(3, j) - S(3, k, j) = C(2, j)$	$\forall j$		
	⑦	$C(1, j+1) - S(1, k, j+1) \geq C(1, j)$	$\forall j \in [1 \dots N-1]$		Ordering of patients.
	⑧	$C(3, j+1) - S(3, k, j+1) \geq C(3, j) - S(3, k, j)$	$\forall j \in [1 \dots N-1]$		
	⑨	$C(2, j+1) - S(2, k, j+1) \geq C(2, j)$	$\forall j \in [1 \dots N-1]$		Non overlapping in the OR.
	⑩	$C(2, j+1) - S(2, k, j+1) \geq C(2, j) + S(3, k, j) + M \cdot (1 - OR(j))$	$\forall j \in [1 \dots N-1]$		Non overlapping in the OR when $OR=1$
	⑪	$C(3, j) - S(3, k, j) \geq C(1, j+1) - M \cdot OR(j)$	$\forall j \in [1, N-1]$		Non overlapping of $A(1)$ and $A(2)$
	⑫	$C(1, j+1) - S(1, k, j+1) \geq C(3, j) - M \cdot OR(j)$	$\forall j \in [1, N-1]$		Non overlapping of $A(1)$ and $A(2)$ if $A(1)$ is not