ISE321-Exercise on Rotation Model

Chang Wang, Hangyi Li, Sinan Aksu

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1 Exercise 3

1. (2.4f)If the combination of resident, rotation and block is in the impossible set, exclude this combination.
2. (2.4g)If the resident cannot work in block b, then exclude this resident p from each rotation in that block b.
3. (2.4h)If resident p cannot perform in rotation r, this resident p is excluded from each block in that rotation.
4. (2.4i)If rotation r cannot be performed in block b, no resident could be assigned to this rotation r in block b.
5. (2.4j)for a all-year resident, he or she must be assigned to have at least one block in a must-do rotation.

2 Food for Thought

1. Busy Rotation i)
$$\sum_{r \in R_{busy}} X_{p,r,b} = 0, \quad \forall (p,b) \in B_{vac}$$
2. ii)
$$X_{p,r,b} + X_{p,r,b+1} \leq 1, \quad \forall p \in P, r \in R_{busy}, b \in B$$
3. Interface with solvers

   In our interface, users are required to record their time availability, Rotation and Block status. After those data are processed in our optimization model, the interface will output the optimized desirable time period. We are thinking of using Python(django framework) for the back-end and HTML, CSS and JavaScript for the front-end.
4. Other Practical Constraints
   (a) Maybe among the residents, some of them are new in the hospital, so we want to avoid having more than n new residents in the same rotation. P_{new} as the set of new residents.
$$\sum_{p \in P_{new}} X_{p,r,b} \leq n, \quad \forall r \in R, b \in B$$