You can’t always get what you want...
Especially if you don’t know what that is.

Lessons in Building Annual Residency Block Schedules

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Residents have a life too!
Vacation  Free weekends  Electives

Fancy Math!
We have designed and implemented a computerized algorithm to produce valid schedules for consideration:

Decision Variables
- \( x_{r,s,t} \): Whether resident \( r \) starts to do rotation \( a \) at time period \( t \)
- \( y_{r,s,t} \): Whether resident \( r \) is assigned to service \( s \) during time period \( t \)

\[
\sum_{a \in A} x_{r,s,t} = 1 \quad \forall r \in R, t \in T
\]

\[
x_{r,s,t} = \frac{1}{\sum_{a \in A} x_{r,s,t}} \sum_{s \in S} x_{r,s,t} \quad \forall r \in R, s \in S, t \in T
\]

\[
w_{r,s,t} \geq \sum_{a \in F} \sum_{s \in S} x_{r,s,t} \geq w_{r,s,t} \quad \forall (r,s,t) \in R \times S \times T, w_{r,s,t}
\]

\[
w_{r,s,t} \geq \sum_{a \in F} \sum_{s \in S} x_{r,s,t} \geq w_{r,s,t} \quad \forall (r,s,t) \in R \times S \times T, w_{r,s,t}
\]

Avoid “bad assignments”
Grant as many requests as possible
Ensure everyone gets their electives
Provide compatible schedules between resident partners
Guarantee all residents’ vacations
Balance workload between residents

Run Algorithm As Many Times As Needed
A schedule is generated
Inputs changed based on feedback
Program Director reviews and gives feedback

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