Optimal Scheduling for Quality Control Labs

1. Problem Statement

**Background**
Quality Control Labs are essential to ensuring safe and effective medication

**Objective**
Develop a personalized weekly schedule for analysts working in labs

2. Project Scope

<table>
<thead>
<tr>
<th>Lab #1</th>
<th>Lab #2</th>
</tr>
</thead>
<tbody>
<tr>
<td># analysts: 15</td>
<td># analysts: 28</td>
</tr>
<tr>
<td># samples: ~250 per week</td>
<td># samples: ~1 250 per week</td>
</tr>
</tbody>
</table>

3. Exploratory Data Analysis

**Data**
- Demand for quality control testing
- Lab capabilities e.g., # analysts
- Testing and regulatory requirements
- Expected test/review time per analysis

4. Current Approach

Lab-specific, heuristic scheduling, which requires multiple manual procedures

**Limitations**
Time consuming Not optimal

5. Challenges

Lab-specific data format
Combining scheduling and assignment problems

6. Optimization

**Decisions**
- When a sample is pulled out of storage
- Who tests a sample and when
- Who reviews a sample and when

**Objective**

Trade-off: Testing Time vs Cycle Time

Analyst’s Average Daily Working Hours

7. Results

8. Scheduling Tool

**User Interface**

9. Future Work

- Extend the number of collaborating labs
- Perform a sensitivity analysis for key components of the process e.g., maximum testing size

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