Committee Assignment

Problem

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Furman University Faculty Governance

- Furman professors are expected to serve on one committee a year as per the Faculty Governance.
- Committee service is considered as part of a tenure package.
- Each committee assignment lasts for three years.
- Faculty members fill out a preference survey.
  - Rank as many preferred committees as they want
  - Rank at most four non-preferred
- The nominating committee assigns new positions.
The Problem

- Assign faculty member to committee so that all committee seats are filled

- **Objective:** Maximize faculty assignment preferences
Decision Variables

\[ x_{ij} = \begin{cases} 
1 & \text{if faculty member } i \text{ is assigned to committee } j \\
0 & \text{if else}
\end{cases} \]

Objective Function

Maximize \[ Z(X) = \vec{1}^T (P^T X + \alpha A^T X) \vec{1} \]

Where \( P \) is a matrix of faculty preferences  
\( \alpha \) is a scalar  
\( A \) is a matrix of eligible assistant professors
Model Constraints

One assignment per professor:
For Faculty Member $i$, $\sum_{j=1}^{c} x_{ij} = 1$

Committee size:
For Committee $j$, $\sum_{i=1}^{f} x_{ij} = S_j$

At least one tenured professor per committee:
For Committee $j$, $\sum_{i=1}^{f} t_{ij} x_{ij} \geq 1$

At least one man per committee:
For Committee $j$, $\sum_{i=1}^{f} m_{ij} x_{ij} \geq 1$

At least one woman per committee:
For Committee $j$, $\sum_{i=1}^{f} w_{ij} x_{ij} \geq 1$

Where $c$ is the number of committees
$f$ is the number of faculty members
$S_j$ is the size of committee $j$
$t_i$ is tenured professors
$m$ is male professors
$w$ is female professors
More Constraints

- Eligibility
- Third year chairs
- Due Process, Faculty Status
- Library
- No repeat assignment
- Divisional balancing constraints

“Here are the minutes from our last meeting: Marty wasted 12 minutes, Janice wasted 7 minutes, Carl wasted 27 minutes, Eileen wasted 9 minutes...”
Results

![Bar chart showing gender distribution across different committees](image-url)
Results

Rank

Committees

- Assistant
- Associate
- Full
Exploring Gender Imbalance

- Males: Serving - 18%, Not Serving - 21%
- Females: Serving - 26%, Not Serving - 22%
Benefits

● 100 person hours required to solve this problem by hand
● Personal politics reduced
● Increased workload will not require an increase in time commitment
● Flexible application that can adapt with changes in committee structure
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Questions?