**WORKFORCE SCHEDULING AT WEATHERTECH CAFE**

**TEAM MEMBERS**

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**INTRODUCTION**

Every workplace is unique, with its own operating costs and set of requirements. As a result, the execution of workforce scheduling is subject to numerous constraints, which can have a significant negative impact on the overall performance of the system. Constraints refer to any condition that might prevent the achievement of goals. The successful execution and control of a workplace rely on effective management of these constraints through planning and short-term look-ahead scheduling. The look-ahead schedule provides a detailed plan of operations and tasks to be accomplished. This project will offer an overview of Weathertech’s workforce scheduling analysis and propose a conceptual framework for managing constraints.

**PROBLEM STATEMENT**

Weathertech café is open seven days a week. The staff consists of both full-time and part-time employees working in different shifts. Each day presents varying levels of demand, requiring different numbers of staff members for each shift. At least one full-time employee is required for closing. Full-time employees must work a minimum of 40 hours a week, while part-time employees, who are students, can select shifts based on their class schedules. Due to budget constraints, the decision was made to either randomly reduce hours or let some people go. On average, full-time employees earn $20 per hour, and part-time employees earn $16 per hour. Moreover, during summer holidays, most students are absent, so only full-time employees work during that period. Optimizing the workforce using linear programming would be beneficial in this scenario, and this approach could also be applied in other areas where the university employs shift workers.

**PLAN**

The team will work on the following project phases over the course:

1. Understand and clean the data.
2. Linear programming formulation of the problem
3. Formulating Excel Solver (To see if it works)
4. Creating a Gurobi Model
5. Validation
6. Evaluating the model
7. Re-engineering or tuning the model as needed.
8. Final model presentation

**DATA**

We met with the shift manager of the Weathertech café to obtain the following data.

Minimum Number of people required in fall on each day:

* Monday to Thursday: 2 Full-Time Employees and 3 Students
* Friday to Sunday: 1 Full-Time Employee and 6 Students

During summer, since students have holidays, 8 full-time employees are required.

Each full-time employee must have a day off each week.

Different items have different selling prices.

NOTE: The below data is for a particular week in summer and fall.

|  |  |  |
| --- | --- | --- |
| **DAY** | **SUMMER** | **FALL** |
| MONDAY | 456 | 1603 |
| TUESDAY | 417 | 1943 |
| WEDNESDAY | 534 | 2031 |
| THURSDAY | 499 | 1795 |
| FRIDAY | 382 | 2013 |
| SATURDAY | CLOSED | 1582 |
| SUNDAY | CLOSED | 1363 |