

# ISE 3230 Project

2024-11-26

## Objective Function

### Travel Cost

$$Travel\ Cost = \sum_i \sum_j (0.81 \cdot d_{ij} \cdot x_{ij})$$

### Mowing Cost

$$Mowing\ Cost = \sum_i t_{ij} \sum_j (x_{ij} \cdot 40)$$

### ##### Blade Change Cost

$$Blade\ Change\ Cost = \sum_i \sum_j (x_{ij} \cdot blade\_change\_cost_k \cdot (blade\_type_i \neq blade\_type_j))$$

## Constraints

Each house has exactly one outgoing route:

$$\sum_{j=0}^n x_{ij} = 1 \quad \forall i$$

Each house has exactly one incoming route:

$$\sum_{i=0}^n x_{ij} = 1 \quad \forall j$$

No self-loops:

$$x_{ii} = 0 \quad \forall i$$

Eliminate sub tours:

$$y_i - y_j + n \cdot x_{ij} \leq n - 1 \quad \forall i, j \quad (i \neq j)$$