

## How This LP Works

- **Decision Variables:** The amount of each food to consume (in grams).
- **Objective Function:** Minimize total cost of the diet.
- **Constraints:**
  - Ensure at least **2500 kcal** of energy.
  - Ensure at least **100g of protein**.
  - Ensure at least **130g of carbs**.
  - Do **not exceed 70g of fat**.

## Brief Explanation of the Code

The Python script **solves a Linear Programming (LP) problem** using the **PuLP** library. The goal is to **minimize the total cost** of a diet while meeting nutritional requirements.

### **Libraries Used**

- `pulp.LpProblem`: Creates the optimization problem.
- `pulp.LpMinimize`: Specifies that we want to minimize an objective function.
- `pulp.LpVariable`: Defines decision variables (amount of each food in grams).
- `pulp.lpSum`: Computes the sum of multiple terms efficiently.

- `pulp.value`: Extracts the final optimized value.

## How the Code Works

1. **Defines the problem** as a minimization problem (`LpProblem`).
2. **Creates decision variables** (`LpVariable`) for each food item.
3. **Sets the objective function to minimize the total cost** of food.
4. **Adds constraints** for:
  - Minimum **calories** ( $\geq 2500$  kcal).
  - Minimum **protein** ( $\geq 100$ g).
  - Minimum **carbs** ( $\geq 130$ g).
  - Maximum **fat** ( $\leq 70$ g).
5. **Solves the problem** using the built-in PuLP solver.
6. **Prints the results**, showing the optimal amount of each food and the minimum cost.

## Results

```
Optimal Diet Plan:  
Rice: 1587.30 grams  
Chicken: 174.60 grams  
Beef: 0.00 grams  
Lentils: 0.00 grams  
Milk: 0.00 grams  
Eggs: 0.00 grams  
Vegetables: 0.00 grams
```

Total Minimum Cost: €48.41