Weekly Diet Preference Optimization

Baihan Lin, Daehyun Kim, Xinyuan Liu, Yijun Ma

**1. Introduction**

In this first project, our group is doing a diet problem. In particular, we are modeling a weekly diet problem to maximize the happiness of every group member in our group. That is, hoping to get the greatest joy, what is the possible diet we can eat every week and still be healthy, meeting all the nutrition levels each person needs per day and also controlling our daily calories intake. In this project, we are basically using the linear programming method to solve our model and get an optimal solution for each one in our group. Specifically, we give advice for our group members on what recipe or what combination of food we should eat to make our week the most cheerful, based on the given solution of solving the linear program of our model.

**2. Background**

(Give history of similar and related problems)

Our weekly diet preference optimization basically likes diet problem. The diet problem is a classic application of linear programming. It was one of the first optimization problems researched in the 1930s and 1940s. The main goal is to select different types of food to meet daily nutritional requirements at minimum cost. Geroge Stigle, one of the earliest researchers studying the problem, came up with an optimization problem called the Stifler diet. He wanted to find the amount of each of 77 foods should be eaten per day in order to at least meet the requirements of dietary allowances suggested by National Research Council with minimal cost. Both of diet problem and diet preference optimization are trying to fulfill the requirements of each different nutrients. In diet problem, it wants to minimize the cost of food with the constraints of nutrition. While, in diet preference optimization, we want to maximize the happiness for people from having meals each week with the constraints of nutrition. We define happiness in different categories of food as a Likert scale of 0 to 10.

**3. The model itself**

**4. Solution**

From the format of the question,

**5. Commentary on solution**

**6. Variations**

**7. Conclusion**

**8. References/bibliography**

**9. Appendixes (optional)**