Project 2 - Linear Programming

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1 Setup

Using data from the United States Department of Agriculture (https://ndb.nal.usda.gov/ndb/), I downloaded nutritional information for five food items, and stored them in *.csv* format in the /Data section of my project directory. The food items are avocado, beans, rice, cheese, and spinach. I imported the *.csv* files using Python in /Code/parse_data.py, and organized the nutritional information according to certain nutritional properties: Protien, Calories, Vitamin C, Vitamin D, Sodium, and Saturated Fat. In the /Code/script.py file, I imported the organized data, in addition to the PulP library to manage the details of the linear program. From there I set up the various food items as variables, added an objective function of the costs associated with the different variables, and specified that I wanted to minimize the objective function. The nutritional information was added as contraints in the linear program.

1.1 Nutritional Information

blah blah Figure 1.1 lakdjf;a a;lsdkfjdkd

	Cheese	Rice	Beans	Avocado	Spinach
Serving Size (g)	28.0	42.0	130.0	136.0	340.0
Protein	7.0	3.0	10.0	2.67	9.72
Calories	110.0	150.0	150.0	227.0	78.0
Sodium	180.0	0.0	341.0	11.0	269.0
Vitamin A	589.0	0.0	0.0	200.0	31882.0
Vitamin C	0.0	0.0	0.0	12.0	95.5
Saturated Fat	5.001	0.0	0.0	2.891	0.214

(a) Nutritional Information

Food	Dollar cost per pound
Cheese	7.71
Rice	1.00
Beans	1.00
Avocado	1.25
Spinach	7.00

(b) Food Costs

Figure 1.1: Global Caption TODO

1.2 Variables

1.3 Objective Function

1.4 Constraints

2 Results

3 Menu

$$\begin{aligned}(x+y)^3 &= (x+y)^2(x+y)\\ &= (x^2+2xy+y^2)(x+y)\\ &= (x^3+2x^2y+xy^2)+(x^2y+2xy^2+y^3)\\ &= x^3+3x^2y+3xy^2+y^3\end{aligned} \tag{3.1}$$

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3.1 Heading on level 2 (subsection)

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3.1.1 Heading on level 3 (subsubsection)

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4 Lists

4.1 Example for list (3*itemize)

- First item in a list
  - First item in a list
    - First item in a list
    - Second item in a list
  - Second item in a list
- Second item in a list

4.2 Example for list (enumerate)

1. First item in a list
2. Second item in a list
3. Third item in a list