PART A

(1/1 point)

Consider a diet problem with two different foods (Food 1 and Food 2) and three different nutrients (Nutrient 1, Nutrient 2, and Nutrient 3). The amount of ounces of each nutrient per unit of food is given in Table 1. The price of Food 1 is $2. The price of Food 2 is $3. The minimum requirements for the Nutrients 1, 2 and 3 are 30, 20, and 12 ounces, respectively. The optimization problem is to find the minimum cost diet that meets the minimum nutritional requirements.

Table 1: Ounces of nutrients on each unit of food

	Food 1	Food 2
Nutrient 1	4	6
Nutrient 2	6	2
Nutrient 3	1	2

The decision variables are

- x how much of food 1 to buy
- y how much of food 2 to buy

The formulation is

$$\left.\begin{array}{rrcl} & \min 2x+3y & & \\ \textbf{s.t.:} & & & \\ \textbf{Nutrient1} & 4x+6y & \geq & 30 \\ \textbf{Nutrient2} & 6x+2y & \geq & 20 \\ \textbf{Nutrient3} & x+2y & \geq & 12 \\ \textbf{Non negativity} & x,y & \geq & 0 \end{array}\right\}$$

Solve the optimization problem in Julia. (You may use spreadsheet optimization instead. But we recommend, as before, that you try using Julia. At first, Julia is much more challenging to use than spreadsheets. In fact, this may continue to be true for a long time. The advantage of Julia is its flexibility, and its ability to deal with complex problems.)

Enter the sum of the optimal values of the decision variables. It will include 1 digit to the right of the decimal point (using rounding, not truncation).

6.8 ✔

6.8

You have used 1 of 2 submissions

PART B

(1/1 point)

Enter the optimal objective value for the problem in Part A. Your (rounded) answer will have one digit to the right of the decimal point.

18.8 ✔

18.8

You have used 1 of 3 submissions

PART C

(1/1 point)

Download fooddata.csv , which contains randomly generated nutritional values for 10 different types of food.

We wish to minimize the number of calories consumed while intaking at least 50 fats, 300 carbohydrates, 60 proteins, and no more than 20 saturated fats.

Formulate a linear program, and determine the minimum number of calories consumed. The "read_csv" or "readtable" function in Julia will be helpful in reading the data set into memory.

Enter the (rounded) optimal number of calories (2 digits to the right of the decimal).

1449.23 ✔

1449.23

You have used 3 of 3 submissions