Linear Regression – Exercise 2

The Cheese

You changed your job and are now working for a cheese manufacturer. Your product management department needs a better understanding of why certain cheeses sell very well, and others sell very slowly. They have identified three properties of the cheese they believe influence the units sold, all rated on a scale of 0 to 10:

- darkness of the color of the cheese: 0=pale as the moon; 10=brown as mud
- smelliness of the cheese: 0=not smelly at all; 10=definitely needs to be stored outside the house
- texture of the cheese: 0=so soft and fluid it may walk away by itself;10=hard as a rock

Cheese	1	2	3	4	5	6	7	8
Color	2	8	4	10	4	7	1	3
Smelliness	4	10	3	0	6	3	1	5
Texture	5	1	5	10	6	6	1	3
Units Sold	1635	261	3615	2453	523	4212	1121	2321

You decide to use multiple linear regression to build a model based on this data. As doing the actual calculations is a lot of work, we will only express the problem so that we can use a computer to perform the calculations.

a) Frame this problem as a multiple regression problem in vector form $\boldsymbol{y} = \boldsymbol{Xb} + \boldsymbol{\varepsilon}$. (we use $\boldsymbol{b}$ instead of $\boldsymbol{\beta}$, as we have actual numbers).

b) How many parameters does the problem have and what are their interpretations?