Overview of Statistics

Statistics is a scientific discipline that provides methods to help us make sense of data. For our purposes, Statistics is comprised of the following components:

1. Conducting studies and collecting data.

2. Summarizing and analyzing data in order to extract the maximum amount of information from data.

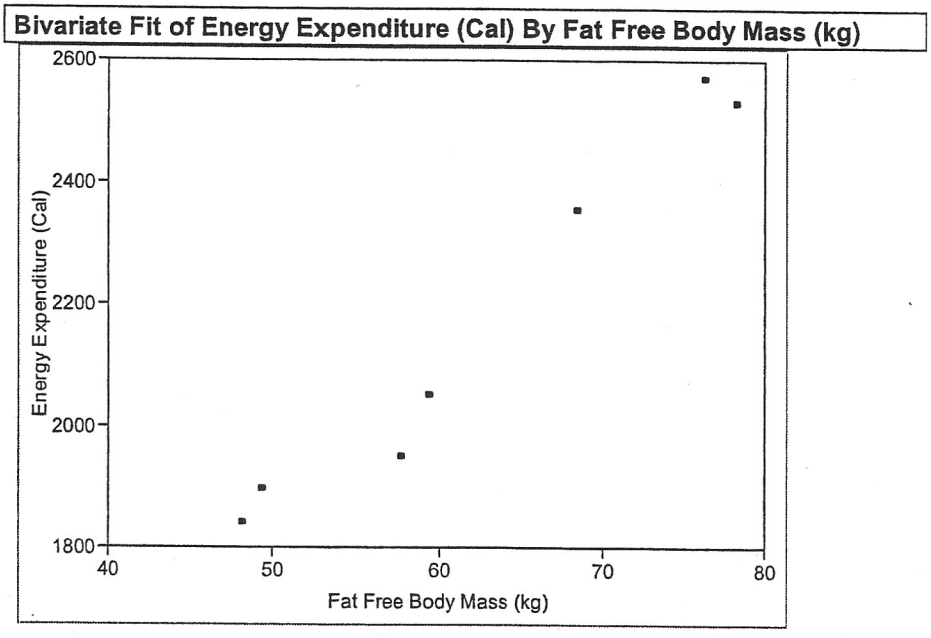
3. Drawing conclusions and making decisions based on data.

Regression analysis is a statistical method used to accomplish the above when the focus of attention is on identifying and fitting relationships between two or more variables.

EXAMPLE: To investigate the dependence of energy expenditure on body build, an underwater weighing device was used to measure the fat-free body mass of seven men. In addition, the 24 hour energy expenditure for each man was measured.

X = fat-free body mass (kg)
Y = energy expenditure (Cal)

Rows	Fat Free Body Mass (kg)	Energy Expenditure (Cal)
1	49.3	1894
2	59.3	2050
3	68.3	2353
4	48.1	1838
5	57.6	1948
6	78.1	2528
7	76.1	2568



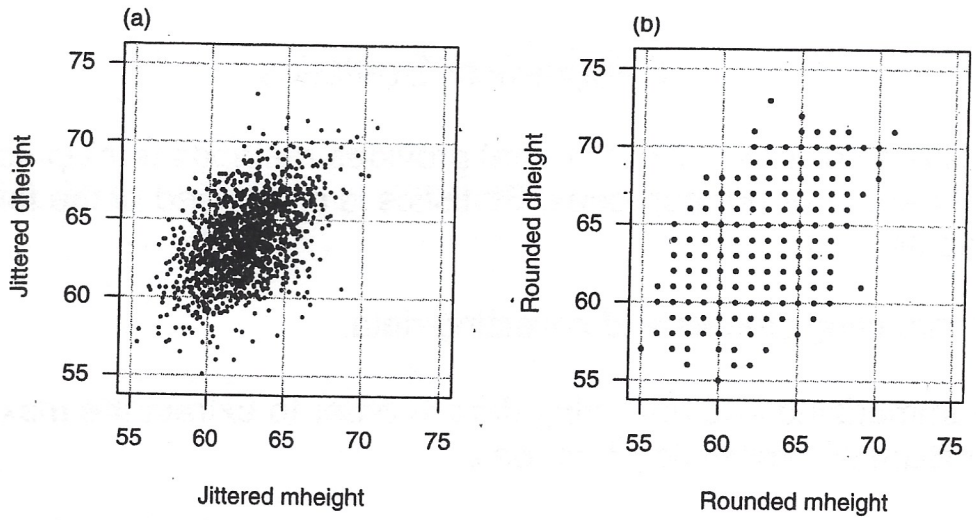


Figure 1.1 Scatterplot of mothers' and daughters' heights in the Pearson and Lee data. The original data have been jittered to avoid overplotting in (a). Plot (b) shows the original data, so each point in the plot refers to one or more mother–daughter pairs.