Exercises: Part 4

1. (Hubble's Law) In 1929, Edwin Hubble investigated the relationship between distance and velocity of celestial objects. Knowledge of this relationship might give clues as to how the universe was formed and what may happen in the future. Hubble's Law is Recession Velocity = $H_0 \times$ Distance, where H_0 is Hubble's constant. This model is a straight line through the origin with slope H_0. Please download the attached Hubble data. Estimate the Hubble constant H_0 by the linear regression model: recession-velocity $= H_0 \times$ distance, check if H_0 is different from zero.
   Plot the observed data Recession Velocity and the fitted values against the distance.

2. Download the attached Cereal rating data. Estimate linear dependence using linear regression model: $\text{rating}_i = \beta_1 \text{sugars}_i + \beta_2 \text{fat}_i + \varepsilon_i$, check if all β's are different from zero and if they all together are significant.
   Plot the data points and the fitted values in 3D scatterplot.