Assignment 2

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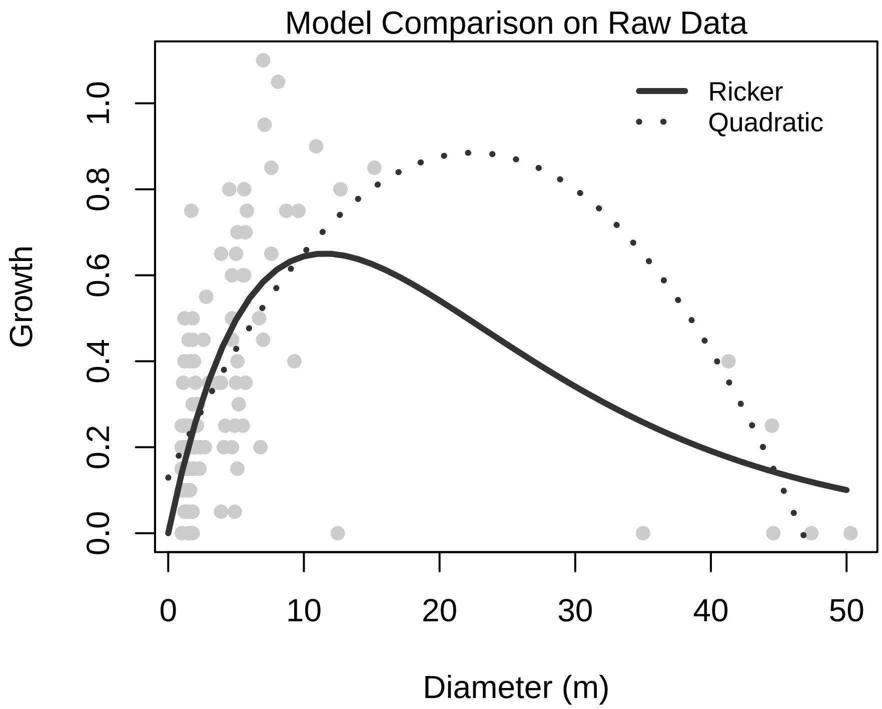
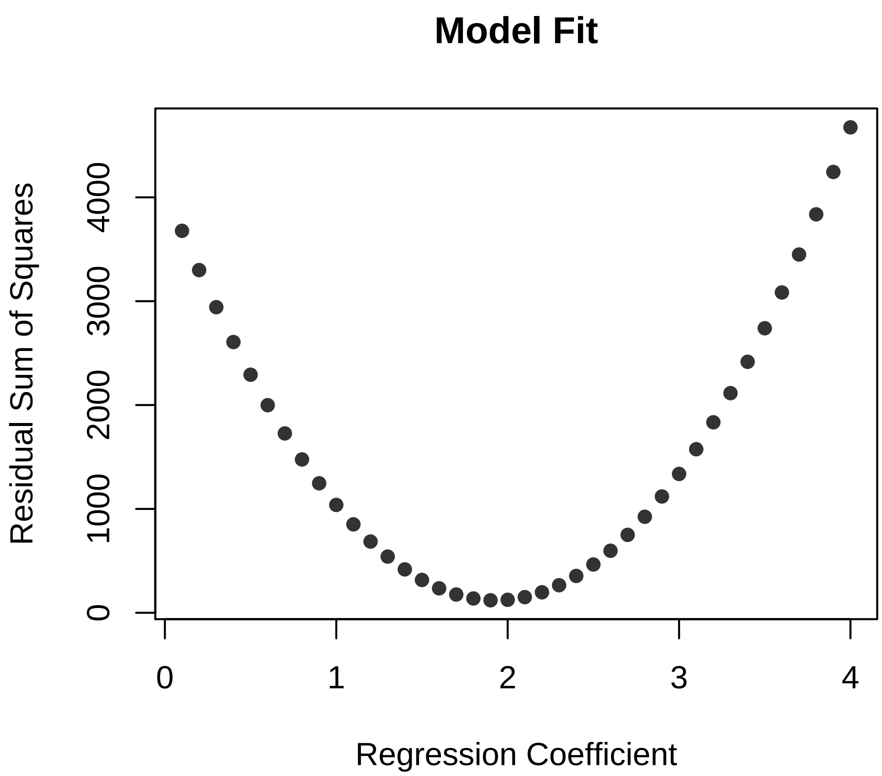
Exercise 1



Exercise 2

```
set.seed(101)
# Generate random x and y data
x <- runif(30, min = 0, max = 10)
y <- rnorm(30, mean = 2 * x, sd = 2)
# Make a vector of potential slope values
slopes <- seq(from = 0.1, to = 4, by = 0.1)
# Make a vector to store the residual sums of squares
ss <- numeric(length(slopes))
# Loop through the slope values
for (i in 1:length(slopes)){
   #calculate predicted y (fx)
  fx <- x * slopes[i] #assume intercept=0
  ss[i] <- sum((fx-y)^2) #calculate RSS and save
}
```



Exercise 3

Rearranged "linearized" equation:

$$\frac{N_{t+1} - N_t}{N_t} = r - \frac{r}{k} N_t$$

where $Y = \frac{N_{t+1} - N_t}{N_t}$, the intercept is r, and the slope is $-\frac{r}{k}$. I then fit this linear regression model to the data to estimate r and k.

Based on the linear regression, r = 0.22 and k = 1208823 (ignoring uncertainty for the sake of simplicity).