Homework 5

due Apr 7, 2020

(For questions **1, 2, 3**) Consider the following paired data sets of length 20:

```
x <- c(6.82, 1.44, 9.39,  8.51, 10.38,  4.59, 14.96,  9.68, 13.54,  6.42, 11.03,
       3.53, 16.91,  9.52,  8.16,  8.97,  8.32,  3.58, 13.57,  9.99)
y <- c(36.69, 6.39, 49.59, 45.65, 52.18, 27.66, 79.35, 54.10, 71.01, 34.60, 61.17,
       22.79, 91.20, 50.57, 44.11, 53.51, 45.96, 22.20, 73.01, 55.70)
```

1. Create a scatter plot to visualize the data (*Hint*: you may want to start with making a data frame and then use `geom_point()`, `x` as x-axis and `y` as y-axis).

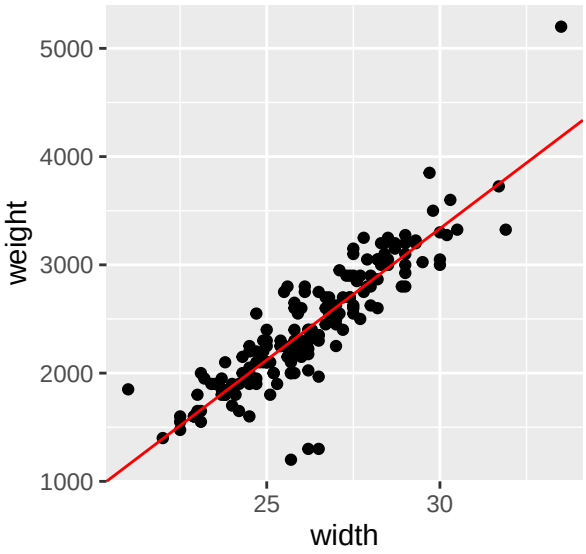
2. Do you think there is a strong linear association between `x` and `y`? Compute the sample correlation coefficient between `x` and `y` to justify your claim.

3. Assume that `y` is an outcome in a certain experiment, and `x` is a predictor. Find the best fitting line describing the association between `x` and `y` by specifying its y-intercept (β_0) and slope (β_1). Overlay the best fitting line to the plot you obtained in **1.** above.

(For questions **4, 5**) Consider the `crabs` data set – you can read in the data using the following code:

```
crabs <- read.table("crabs.tsv", header = T, sep = "\t")
```

4. Obtain the following scatter plot with the best fitting line:



5.. Compute R^2, the coefficient of determination.