## 3.4: Exercises

The age ($x$) and resting heart rate (RHR, $y$) were measured for nine men, yielding this dataset:

$$\begin{array}{lccccccccc} x: & 20 & 23 & 30 & 37 & 35 & 45 & 51 & 60 & 63 \\ y: & 72 & 71 & 73 & 74 & 74 & 73 & 75 & 75 & 77 \end{array} \tag{3.4.1}$$

Make a scatterplot of these data.

Based on the scatterplot, what do you think the correlation coefficient $r$ will be?

Now compute $r$.

Compute the LSRL for these data, write down its equation, and sketch it on top of your scatterplot.

*[You may, of course, do as much of this with electronic tools as you like. However, you should explain what tool you are using, how you used it, and what it must have been doing behind the scenes to get the results which it displayed and you are turning in.]*

Continuing with the data and computations of the previous problem:

What percentage of the variation in RHR is associated with variation in age?

Write the following sentences with blanks filled in: "If I measured the RHR of a 55 year-old man, I would expect it to be . Making an estimate like this is called ."

Just looking at the equation of the LSRL, what does it suggest should be the RHR of a newborn baby? Explain.

Also explain what an estimate like yours for the RHR of a baby is called. This kind of estimate is considered a bad idea in many cases – explain why in general, and also use specifics from this particular case.

Write down a bivariate quantitative dataset for a population of only two individuals whose LSRL is $\hat{y} = 2x - 1$ .

What is the correlation coefficient of your dataset?

Next, add one more point to the dataset in such a way that you don't change the LSRL or correlation coefficient.

Finally, can your find a dataset with the same LSRL but having a larger correlation coefficient than you just had?

*[Hint: fool around with modifications or additions to the datasets in you already found in this problem, using an electronic tool to do all the computational work. When you find a good one, write it down and explain what you thinking was as you searched for it.*