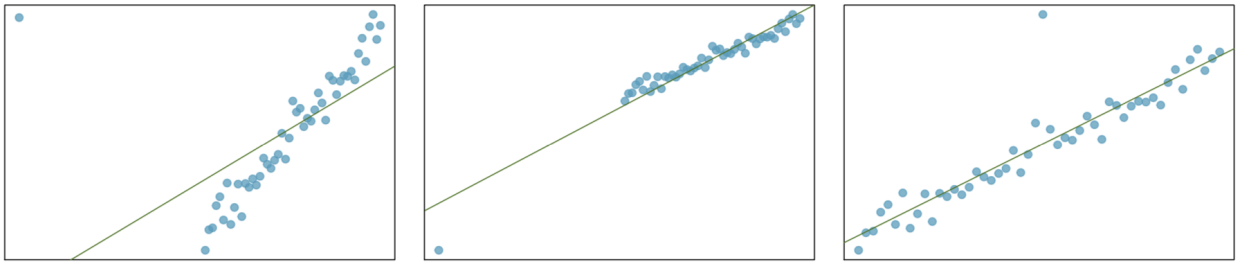
Note: "OIS" refers to OpenIntro Statistics, the textbook for this class.

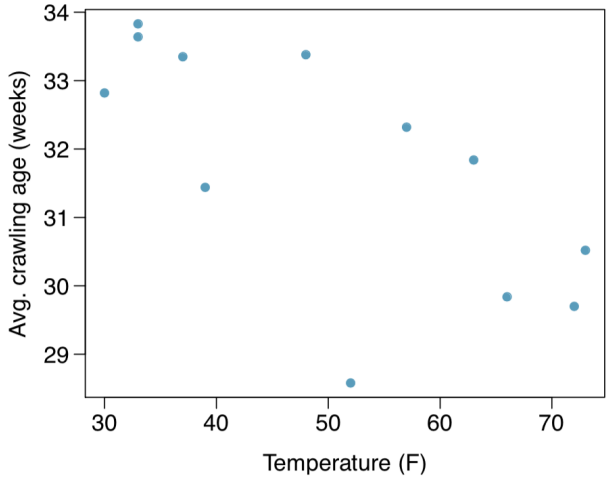
Problem 1: OIS Exercise 8.28, page 330 (3 pts)

Identify the outliers in the scatterplots shown below and determine what type of outliers they are. Explain your reasoning.



Problem 2: OIS Exercise 8.30, page 330 (2 pts)

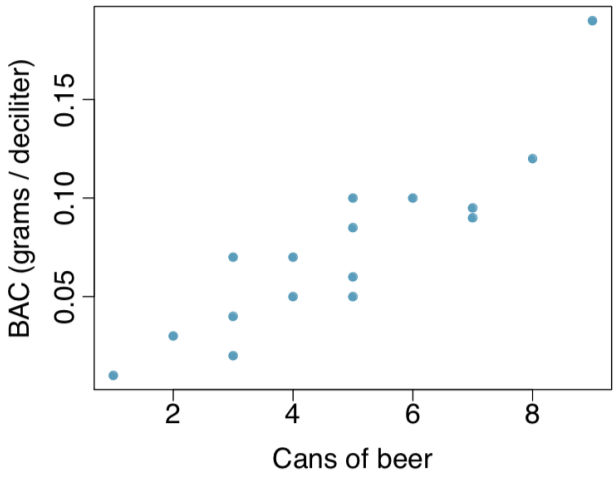
Exercise 8.12 introduces data on the average monthly temperature during the month babies first try to crawl (about 6 months after birth) and the average first crawling age for babies born in a given month. A scatterplot of these two variables reveals a potential outlying month when the average temperature is about 53 degrees F and average crawling age is about 28.5 weeks. Does this point have high leverage? Is it an influential point?



Problem 3: OIS Exercise 8.32a-d, page 335 (10 pts)

Many people believe that gender, weight, drinking habits, and many other factors are much more important in predicting blood alcohol content (BAC) than simply considering the number of drinks a person consumed.

Here we examine data from sixteen student volunteers at Ohio State University who each drank a randomly assigned number of cans of beer. These students were evenly divided between men and women, and they differed in weight and drinking habits. Thirty minutes later, a police officer measured their blood alcohol content (BAC) in grams of alcohol per deciliter of blood.[19] The scatterplot and regression table summarize the findings.



	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	-0.0127	0.0126	-1.00	0.3320
beers	0.0180	0.0024	7.48	0.0000

(a) Describe the relationship between the number of cans of beer and BAC (2 pts).

(b) Write the equation of the regression line. Interpret the slope and intercept in context (3 pts).

(c) Do the data provide strong evidence that drinking more cans of beer is associated with an increase in blood alcohol? State the null and alternative hypotheses, report the p-value, and state your conclusion (3 pts).

[19] J. Malkevitch and L.M. Lesser. *For All Practical Purposes: Mathematical Literacy in Today's World.* WH Freeman & Co, 2008.

Problem 4: OIS Exercise 8.32, extended (5 pts)

(a) Using the link https://www.openintro.org/stat/data/csv/bac.csv, load the blood alcohol dataset into R.

```
bac <- read.csv("https://www.openintro.org/stat/data/csv/bac.csv")
```

(b) Rebuild the linear model predicting BAC from beers (1 pt).

(c) Create the residual plot for the model. Are there any patterns present (4 pts)?