

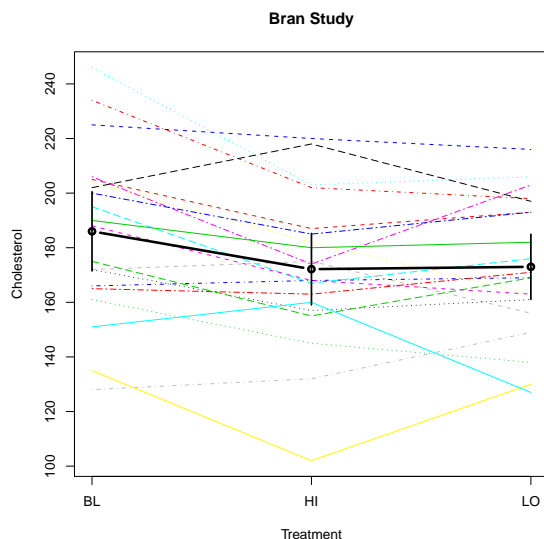
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36-402/608 ADA-II Breakout #12 Results

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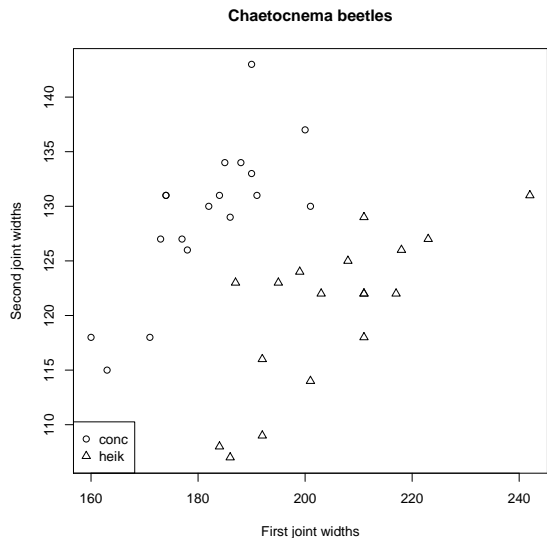
The bran data (case1602.csv) are from 20 subjects studied in a randomized, double-blind diet manipulation trial. For each subject, cholesterol was measured 1) during a baseline period while the subject was on their normal diet, 2) at the end of the first 6 week diet trial, and 3) at the end of the second six week diet trial. (There was a return to normal diet for two weeks between the trials.) The two experimental diets were low-fiber (from wheat) and high-fiber (from oat bran). The order of the diets was randomly assigned. The scientific questions were whether or not the high fiber diet lowered cholesterol relative to baseline and whether the effect might be just due to reduced fat calories rather than the high fiber content of the oat bran.

```
# Raw bran data and means
plot(c(1,3), lim, type="n", xlab="Treatment", ylab="Cholesterol",
     main="Bran Study", axes=FALSE)
box() # bounding box for graph
axis(2) # normal y-axis
axis(1, at=1:3, labels=c("BL","HI","LO")) # custom x-axis
# individual data as lines:
for (i in 1:nrow(bran)) lines(1:3, bran[i,1:3], col=i+1, lty=i+1)
# Group means and SEs:
means = sapply(bran[,1:3],mean)
lines(1:3, means, lwd=3, type="b")
SE = sqrt(sapply(bran[,1:3],var)/nrow(bran)) # (allow non-constant variance)
multiplier = qt(0.975, nrow(bran)-1)
segments(1:3, means-SE*multiplier, 1:3, means+SE*multiplier, lwd=2)
```



Question 1: What type of study is this? What should we test? How does the graphics code work?

The flea beetle data (ex1613.csv) consists of measurements of the first and second joint widths of the feet of flea beetles from two different species. These measurements are intended to distinguish between the two species more clearly than either individual measurement.



Question 2: What type of study is this? How might you use these data to classify future beetles?

The Skodak and Skeels data (ex1605.csv) looks at IQ in adopted children at ages 2, 4, 8 and 13. The foster mothers education (fmed) and the birth mothers IQ (tmiq) are also measured for each child.

| | fmed | tmiq | age2iq | age4iq | age8iq | age13iq |
|-----|------|------|--------|--------|--------|---------|
| 1 | 10 | 100 | 120 | 115 | 109 | 106 |
| 2 | 10 | 71 | 131 | 109 | 113 | 95 |
| 3 | 14 | 89 | 126 | 115 | 113 | 90 |
| ... | | | | | | |
| 60 | 10 | 90 | 122 | 127 | 129 | 126 |
| 61 | 15 | 104 | 108 | 124 | 116 | 113 |
| 62 | 8 | 88 | 122 | 112 | 119 | 97 |

Question 3: What type of study is this? What EDA would you produce? Consider what simplified data might be most appropriate, then choose what testing you might do to find out the effects of the two mothers on the child's IQ.