

Consider the following common ANCOVA situation: you have a dependent variable  $Y$  and a covariate  $X$ . The data are below:

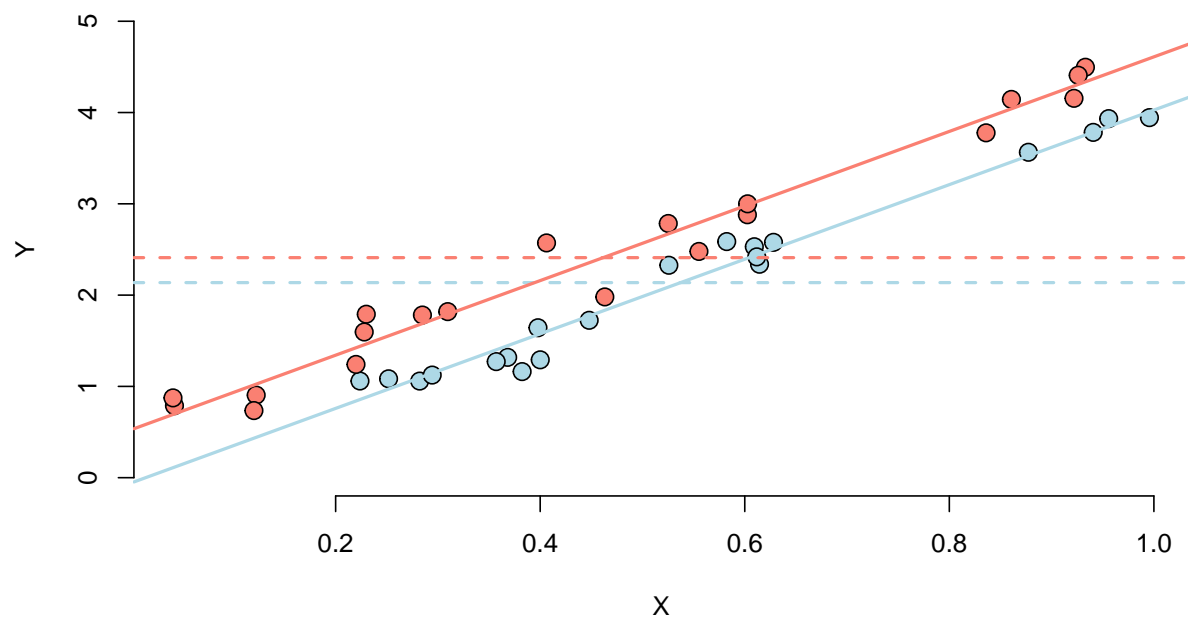
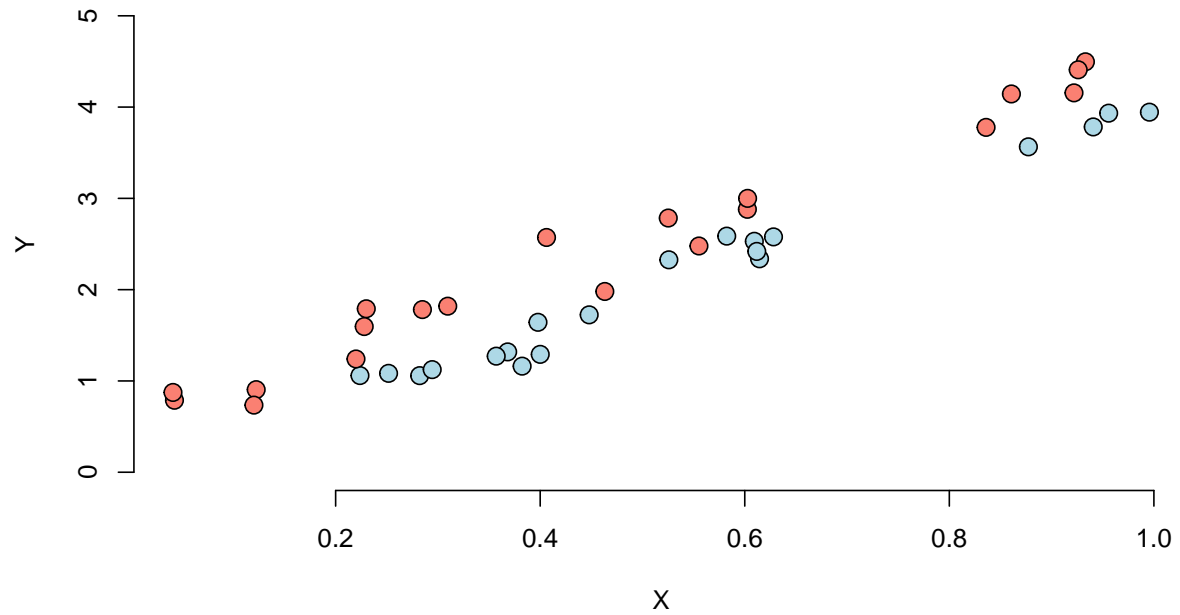
Group	$X$	$Y$
1	1	7.0
	2	10.5
	3	13.0
	4	14.5
2	0	7.5
	1	11.0
	2	13.5
	3	15.0

- Calculate the group means  $\bar{Y}_j$  for  $j = 1, 2$ .
- Assuming that  $\beta = 2.5$ , calculate the adjusted group means  $\bar{Y}'_j$  for  $j = 1, 2$ .
- What effect (if any) did the covariate adjustment have on the overall results? Explain.

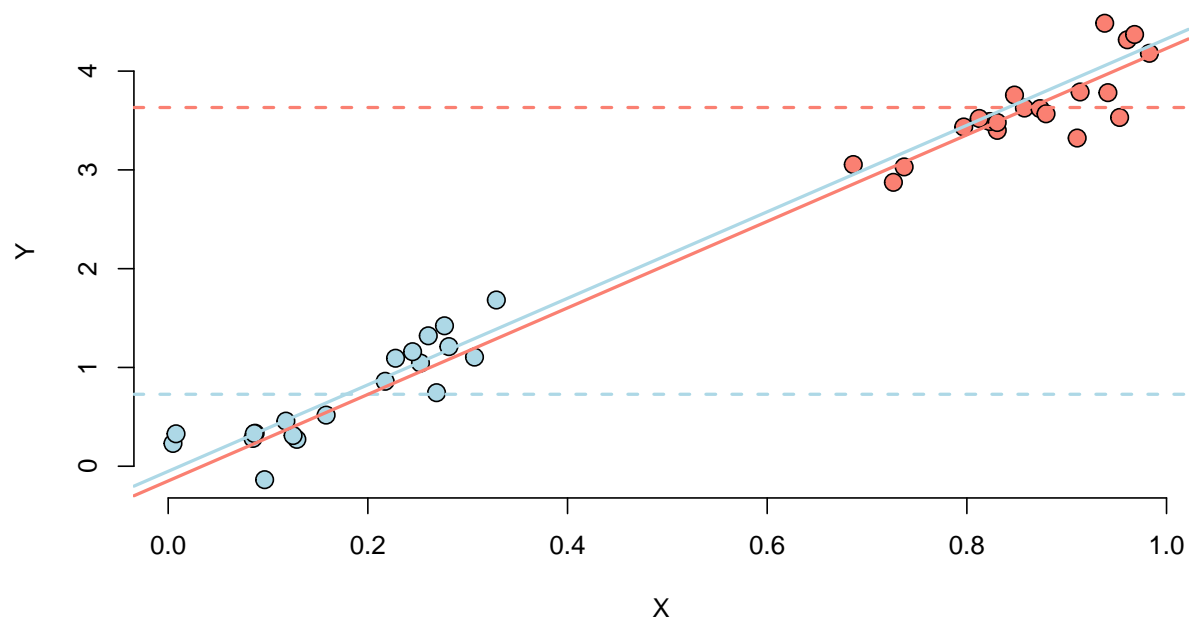
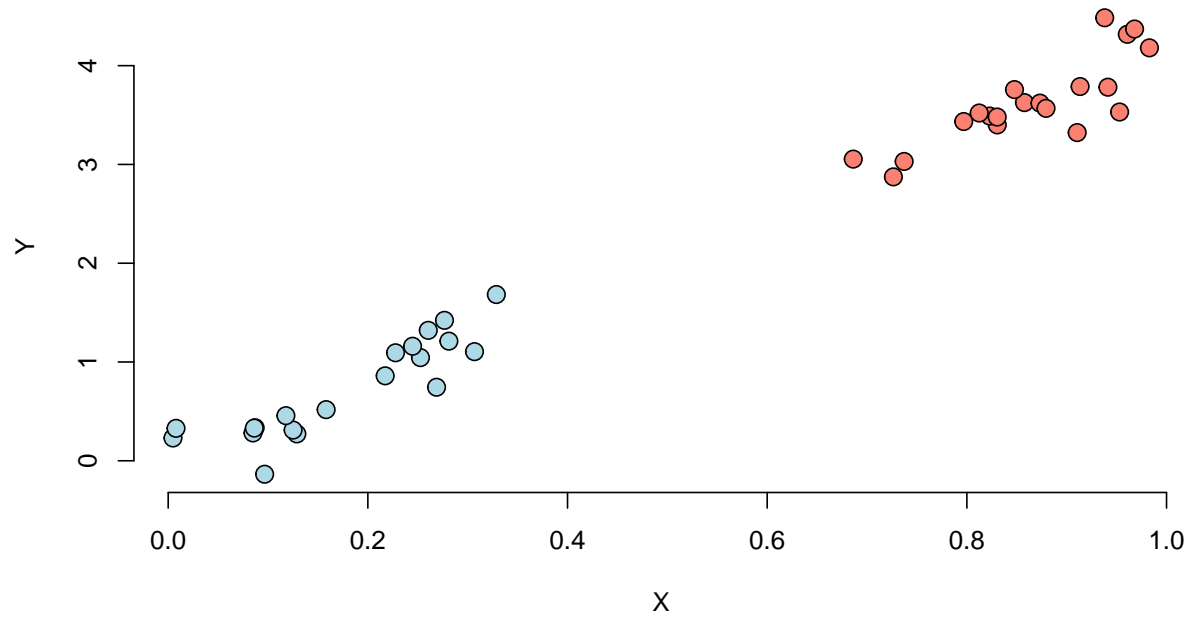
A researcher is interested in how two drugs affect pulse rate in rats. Eighteen rats are randomly allocated to one of two drug treatment conditions. The first group receives drug 1, whereas the second group receives drug 2. For each rat, the weight in grams was also recorded. The data may be downloaded from <https://bit.ly/395BMP9>

- Perform an ANOVA testing whether there are significant differences in pulse rate between the two drugs. Report the results of your test along with the group means.
- Perform an ANCOVA to include the effect of weight. Report the results of your test along with the adjusted group means.

Describe what is happening in this picture:



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