

Multiple Regression handout (Ozone pollution)

(two pages, two sheets, pages 195-202 reduced)

- ① What does `pairs()` do?
- ② What is it used for or used to look at?
(`pairs(ozone.pollution, panel = panel.smooth)`)
— page 195 of handout —
- ③ `par(mfrow = c(1,2))` two plots, side by side, in 1 row 2 columns.
`par(mfrow = c(2,2))` four plots in 2x2 array — (p196)
- ④ What does the acronym GAM stand for?
(p196)
- ⑤ "It is well to remember the following truths about models:"

all models

p119

some models

the correct model

the simpler the model,

Four truths about models —

Model Criticism
(p119)

(p119) GAMs: Generalized Additive Models

"There are several ways that we can improve things if it turns out that our present model is inadequate."

— Be able to list 3 of the 6 — any 3 —

⑥ What does `par(mfrow = c(1,1))` do?

⑦ Be able to interpret the tree model output from R. (See page 197)

⑧ What is the `I` function for in R?
`I()` stands for "as is", and it overrides R interpreting a model symbol as an operator, as a formula operator.
See page 198

`model1 ~ I(rad^2) + I(temp^2) + I(wind^2)`

`I()`
needed

quadratic terms, only if function `I()` is used to keep the \wedge "as is", i.e. as meaning "to the power"
 rad^2 and $temp^2$ and $wind^2$

⑨ What is the syntax in R for `update()` function? p 198-200

p199 `model5 ← update(model4, ~. - I(rad^2))`

⑩ \sim what is there already
tilde dot or tilde period

$\sim.$

⑪ - (minus) indicates deletion of an explanatory variable from the model

`model2 <- update(model1, ~. - temp:wind:rad)`

page 198

- removing the 3 way interaction term from the model

⑫ Why was a log transformation done on the OZONE response variable?

See plot(model6) output (page 199-200)

Bad news #1?

Bad news #2?

How do you tell from the plots the bad news (or not)?

What is the syntax for log transforming of a response variable like ozone?