

~ 20 minutes
do old in class

some students
are not writing
enough information

	variables	AIC
treat	age sex height weight pattern cort anti	384.226
treat	age sex weight pattern cort anti	382.357
treat	age weight pattern cort anti	380.718
treat	age weight cort anti	379.133
treat	age weight cort	377.674
treat ^{ea} <u>treat</u>	age weight	377.699
treat	age	377.524 $\leftarrow I_{min}$
treat		378.433

for this to be
useful exam
notes, they
will likely
forget
formulas

1) Data from Collett (2003, p. 367) is from a study on chronic granulomatous disease. The response variable is *time* until infection. Predictors include *treatment* (0=placebo 1=interferon), *age*, *sex* (1=male 2=female), *height*, *weight*, *pattern* of inheritance (1=x-linked 2=autosomal recessive), *cort* (1=corticosteroids used at trial entry 2=not used), and *anti* (1=antibiotics used 0=not used). Results from backward elimination are shown.

a) What is the minimum AIC submodel I_{min} ?

treat, age

b) What is the best starting submodel I_I ?

treat

$$378.433 = AIC(I_I) \leq AIC(I_{min}) + 2 = 379.524$$

c) Are there any other candidate submodels? Explain briefly.

no want candidates to have fewer predictors than I_I .

(or there are no candidate submodels with fewer predictors than I_I .)

	M1	M2	M3	M4
# of predictors	8	3	2	1
# with $0.01 \leq p\text{-value} \leq 0.05$	0	0	0	0
# with $p\text{-value} > 0.05$	7	2	1	0
$-2 \log(L)$	368.266	371.699	373.524	376.433
$AIC(I)$	384.226	377.699	377.524	378.433
p-value for change in PLR test	1.0	0.634	0.511	0.318

2) The above table gives summary statistics for 4 PH regression models considered as final submodels after performing variable selection. Assume that the PH assumptions hold for all 4 models. The full model was M1, and M3 was the minimum AIC model found. Which model should be considered as the first starting submodel I_0 ? Explain briefly why each of the other 3 submodels should not be used as the starting submodel.

I_0 ?

$$AIC(I_{\min}) + 2 = 379.524$$

$$I_0 = M4$$

M1, M2, M3 have too many predictors