Biology 4605/7220
Quiz #7b

Name Key
28 October 2015

For each of the following data situations (1 and 2):

(A) Define variables in a tabular format, as follows: name symbol scale [3]/variable
scale = nominal, ordinal, or cardinal (where cardinal = interval or ratio scale)

(B) Using your symbols, write a general linear model relating the response variable to explanatory variable(s) and interaction terms (if appropriate). [1]/term

(C) Write the degrees of freedom below the response variable, each explanatory variable, and the error term in the model [1]/term

(D) Complete the first two columns of the ANOVA table [2]/term

(E) State the name of the analysis, from the following list.
t-test, one-way ANOVA
regression (one explanatory variable), multiple regression (two or more explanatory)
2-way ANOVA = 2 nominal scale (categorical) explanatory variables [1]
none of the above.

1. Height is frequently named as a good predictor variable of weight among people of the same age and gender. Roberts (*American Journal of Clinical Nutrition* 54:499) measured the heights (cm) and weights (kg) of 14 males between the ages of 19 and 26 years of age. Does weight depend on height ?

A.

name	symbol	scale
Weight	Wt	cardinal
Height	Ht	cardinal

D.

source	df
Height	1
residual	12
total	13

B. $Wt = \beta_0 + \beta_{Ht} Ht + \epsilon$

C. $13 \quad 1 \quad 12$

E. Regression

2. Does blood pressure in hypertensive people depend on stress, as well as age and weight? For a random sample of 20 patients with hypertension, Daniel (*Biostatistics*, 1995,p 427) reported mean arterial blood pressure (mm Hg) in relation to 3 variables: age (years), weight (kg), and a measure of stress ranging from 8 to 99. (Assume no interactive effects of explanatory variables on the response variable).

A.

name	symbol	scale
Blood Pressure	BP	cardinal
stress	S	"
Age	A	"
Weight	W	"

D.

source	df
Stress	1
Age	1
Weight	1
residual	16
total	19

B. $BP = \beta_0 + \beta_S \cdot S + \beta_A \cdot A + \beta_W \cdot W + \epsilon$

C. $19 = 1 \quad 1 \quad 1 \quad 1 \quad + 16$

E. Multiple regression