Advanced Biostatistics   **Quiz 1**   **Name** _____
February 9, 2005   **13 Total Points**

Directions: <u>Thoroughly, clearly and neatly</u> answer the following two problems in the space given, showing all relevant calculations. Unless otherwise noted, use $\alpha = 5\%$ throughout.

1. (1.5 + 3 + 1.5 = 6 points) Age (in years) and plasma levels of total cholesterol (in mg/ml) were recorded for 24 patients suffering from hyperlipoproteinaemia, and medical researchers assumed a linear relationship between age and chole sterol with age serving as the linear predictor variable. The data are plotted and SLR performed on the attached Addendum.

    (a) State the assumptions that must be made for the SLR analysis in the context of this study. Be specific.

    (b) ***Clearly*** interpret the estimate of the slope parameter in this SLR model in the context of this study, remembering to give the units. Hint: It may be easiest to consider what this model predicts will happen to a similar patient's cholesterol as his/her age increases by 19 years.

    (c) Comment on the adequacy of the assumed model in the context of this study.

2. (2.5 + 4.5 = 7 points) Bishop (1969) reported the following table of data corresponding to 715 babies classified according to the level of antenatal car they received and whether or not they survived..

		Survival	
		Survived	Died
Antenatal	Low	373	20
Care	High	316	6

(a) Obtain and ***clearly interpret*** the sample odds ratio for these data, paying particular attention to your detailed interpretation.

(b) Obtain and ***clearly interpret*** the **90%** confidence interval for the true odds ratio for these data, paying particular attention to your detailed interpretation. What are the ramifications of these data?

Minitab Output for Question 1
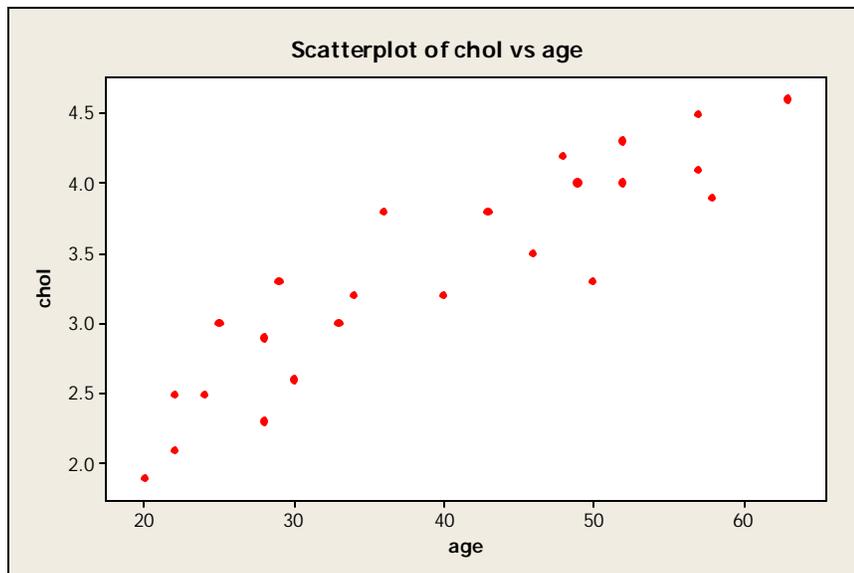
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Regression Analysis: chol versus age

The regression equation is
chol = 1.28 + 0.0526 age

Predictor       Coef    SE Coef       T      P
Constant      1.2799     0.2157    5.93  0.000
age         0.052625   0.005192  10.14  0.000

S = 0.334039   R-Sq = 82.4%   R-Sq(adj) = 81.6%

Analysis of Variance
Source          DF      SS      MS       F      P
Regression       1  11.465  11.465  102.75  0.000
Residual Error  22   2.455   0.112
Total           23  13.920
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Minitab Scatterplot for Question 1

Use the back of this page for scratch paper, and put your name at the top and turn it in if you want it considered; otherwise, retain this page for your future reference.