

HW 12 [PG] : Due Friday, Nov 21, 2003

Chapter 12: Exercise: 11 Chapter 17: Exercises: 5, 7

Ch12, 11: a. Using the two-sample t test with equal variances, the test statistic $t = -0.6072$ and $p = 0.5451$. We are unable to reject the null hypothesis that mean systolic blood pressure is the same for boys and girls.

b. Using the one-way ANOVA, the test statistic $F = 0.37$ and $p = 0.5451$. Again, we are unable to reject the null hypothesis.

Note that we have discussed this in class. For the two-sample problem assuming equal variances, $F = t^2$. So t test and ANOVA give the same answer.

Ch 17, 5: a. scatter plot.

b. There appears to be a slight tendency for the cholesterol to increase as triglyceride increases.

c. The Pearson correlation is $r = 0.650$.

d. To test the null hypothesis that the population correlation ρ is 0, we calculate the statistic

$$t = \frac{r}{\sqrt{(1-r^2)/(n-2)}} = \frac{0.650}{\sqrt{(1-0.650^2)/(10-2)}} = 2.42.$$

For a t distribution with $10 - 2 = 8$ df, $0.02 < p < 0.05$. Therefore, we reject the null hypothesis that the correlation is 0.

e. The Spearman rank correlation

$$r_s = 0.418.$$

f. The rank correlation is smaller in magnitude than the Pearson correlation coefficient r . However, it still suggests a moderate positive relationship between cholesterol and triglyceride levels.

g. To test $H_0 : \rho = 0$ using r_s , we calculate

$$t = \frac{r_s}{\sqrt{(1-r_s^2)/(n-2)}} = \frac{0.418}{\sqrt{(1-0.418^2)/(10-2)}} = 1.30.$$

In this case, $p > 0.10$ and we are unable to reject the null hypothesis.

Ch 17, 7: a. Since *Apgar5* is an ordinal variable, Spearman's rank correlation must be used. The rank correlation $r_s = 0.1084$.

b. Because the rank correlation is positive, *Apgar5* score tends to increase as systolic blood pressure increases.

c. For the test of null hypothesis that ρ is 0, $p = 0.2832$. We are unable to reject the null hypothesis.