Chapter 11: Section Exercises #3, 4, 6, 14 , 16
NO P-Values are necessary for these problems

**11.3 Semester GPAs are compared for seven randomly chosen students in each class level at Oxnard**

**University. Does the data prove a significant difference in mean GPAs? GPA1**

**GPA for Randomly Selected Students in Four Business Majors**

***Accounting Finance Human Resources Marketing***

2.48 3.16 2.93 3.54

2.19 3.01 2.89 3.71

2.62 3.07 3.48 2.94

3.15 2.88 3.33 3.46

3.56 3.33 3.53 3.50

2.53 2.87 2.95 3.25

3.31 2.85 3.58 3.20

**11.4 Sales of *People* magazine are compared over a 5-week period at four Borders outlets in Chicago.**

**Does the data prove a significant difference in mean weekly sales? Magazines**

**Weekly Sales**

***Store 1 Store 2 Store 3 Store 4***

102 97 89 100

106 77 91 116

105 82 75 87

115 80 106 102

112 101 94 100

**11.6 Refer to Exercise 11.2. Which pairs of mean examination times differ significantly (4 physicians)?**

**Physicians**

 ***11.2*** *One particular morning, the length of time spent in the examination rooms is recorded for each*

*patient seen by each physician at an orthopedic clinic. Does the data prove a significant difference*

*in mean times?* ***Physicians***

 ***Time in Exam Rooms (Minutes)FIGURE 11.12***

***Physician 1 Physician 2 Physician 3 Physician 4***

*34 33 17 28*

*25 35 30 33*

*27 31 30 31*

*31 31 26 27*

*26 42 32 32*

*34 33 28 33*

*21 26 40*

*29*

**11.14 Engineers are testing company fleet vehicle fuel economy (miles per gallon) performance by**

**using different types of fuel. One vehicle of each size is tested. Does this sample prove that there**

**is a significant difference in treatment means? MPG2**

***87 Octane 89 Octane 91 Octane Ethanol 5% Ethanol 10%***

*Compact* 27.2 30.0 30.3 26.8 25.8

*Mid-Size* 23.0 25.6 28.6 26.6 23.3

*Full-Size* 21.4 22.5 22.2 18.9 20.8

*SUV* 18.7 24.1 22.1 18.7 17.4

**11.16 A beer distributor is comparing quarterly sales of Coors Light (number of six-packs sold) at**

**three convenience stores. Does this sample prove a significant difference in treatment means?**

**BeerSales**

***Store 1 Store 2 Store 3***

*Qtr 1* 1,521 1,298 1,708

*Qtr 2* 1,396 1,492 1,382

*Qtr 3* 1,178 1,052 1,132

*Qtr 4* 1,730 1,659 1,851

Chapter 12: Section Exercise #2, 4, 6, 8, 10

*Instructions for Exercises 12.2 and 12.3:* (a) Make an Excel scatter plot. What does it suggest about

the population correlation between *X* and *Y*? (b) Make an Excel worksheet to calculate *SSxx* , *SSyy* , and

*SSxy* . Use these sums to calculate the sample correlation coefficient. Check your work by using Excel’s

function =CORREL(array1,array2). (c) Use Appendix D to find *t.*05 for a two-tailed test for zero correlation.

(d) Calculate the *t* test statistic. Can you reject *ρ* = 0? (e) Use Excel’s function =TDIST(t,deg\_freedom,tails)

to calculate the two-tail *p*-value.

**12.2 Part-Time Weekly Earnings ($) by College Students WeekPay**

***Hours Worked (X) Weekly Pay (Y)***

10 93

15 171

20 204

20 156

35 261

*Instructions for Exercises 12.4–12.6:* (a) Make a scatter plot of the data. What does it suggest about the

correlation between *X* and *Y*? (b) Use Excel, MegaStat, or MINITAB to calculate the correlation coefficient.

(c) Use Excel or Appendix D to find *t.*05 for a two-tailed test. (d) Calculate the *t* test statistic.

(e) Calculate the critical value of *rα*. (f) Can you reject *ρ* = 0?

**12.4 Moviegoer Spending ($) on Snacks Movies**

***Age (X) Spent (Y)***

30 2.85

50 6.50

34 1.50

12 6.35

37 6.20

33 6.75

36 3.60

26 6.10

18 8.35

46 4.35

**12.6 Number of Orders and Shipping Cost ($) ShipCost**

***Orders (X) Ship Cost (Y)***

1,068 4,489

1,026 5,611

767 3,290

885 4,113

1,156 4,883

1,146 5,425

892 4,414

938 5,506

769 3,346

677 3,673

1,174 6,542

1,009 5,088

**12.8** (a) Interpret the slope of the fitted regression *Sales* = 842 − 37*.*5 *Price*. (b) If *Price* = 20, what is

the prediction for *Sales*? (c) Would the intercept be meaningful if this regression represents DVD

sales at Blockbuster?

**12.10** The regression equation *NetIncome* = 2,277 + *.*0307 *Revenue* was fitted from a sample of 100

leading world companies (variables are in millions of dollars). (a) Interpret the slope. (b) Is the intercept

meaningful? Explain. (c) Make a prediction of *NetIncome* when *Revenue* = 1,000. (Data are

from www.forbes.com and *Forbes* 172, no. 2 [July 21, 2003], pp. 108–110.) **Global100**

Chapter 13 (no p-values): Section Exercise # 2, 4 ,6

**13.2** Observations are taken on sales of a certain mountain bike in 30 sporting goods stores. The

regression model was *Y* = total sales (thousands of dollars), *X*1 = display floor space (square

meters), *X*2 = competitors’ advertising expenditures (thousands of dollars), *X*3 = advertised price

(dollars per unit). (a) Write the fitted regression equation. (b) Interpret each coefficient. (c) Would

the intercept seem to have meaning in this regression? (d) Make a prediction for *Sales* when

*FloorSpace* = 80, *CompetingAds* = 100, and *Price* = 1,200. **Bikes**

**13.4** Refer to the ANOVA table for this regression. (a) State the degrees of freedom for the *F* test for

overall significance. (b) Use Appendix F to look up the critical value of *F* for *α* = *.*05*.* (c) Calculate

the *F* statistic. Is the regression significant overall? (d) Calculate *R*2 and *R*2

adj, showing your

formulas clearly. **Bikes**

***Source d.f. SS MS***

Regression 3 1,196,410 398,803

Error 26 379,332 14,590

Total 29 1,575,742

**13.6** Observations are taken on sales of a certain mountain bike in 30 sporting goods stores. The

regression model was *Y* = total sales (thousands of dollars), *X*1 = display floor space (square

meters), *X*2 = competitors’ advertising expenditures (thousands of dollars), *X*3 = advertised

price (dollars per unit), *X*4 = rebate rate (percent of retail price). (a) Calculate the *t* statistic for

each coefficient to test for *β* = 0*.* (b) Look up the critical value of Student’s *t* in Appendix D for a

two-tailed test at *α* = *.*01*.* Which coefficients differ significantly from zero? (c) Use Excel to find

the *p*-value for each coefficient. **Bikes**

***Predictor Coefficient SE***

*Intercept* 1225.4 397.3

*FloorSpace* 11.522 1.330

*CompetingAds* −6.935 3.905

*Price* −0.14955 0.08927