

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICAL SCIENCES
DHAHRAN, SAUDI ARABIA

STAT 212: BUSINESS STATISTICS II

Semester 051

Mid Term Exam No.2

Saturday December 3, 2005

7:00 - 8:30 pm

Please **circle** your instructor's name:

Hassen Muttlak

Walid Al-Sabah

Marwan Al-Momani

Name: _____

ID#: _____

Section: _____

Question No	Full Marks	Marks Obtained
1	10	
2	12	
3	18	
4	10	
Total	50	

Note: For each question: Clearly state your hypotheses, assumptions and your conclusions. Use 5% level of significance unless specified other wise in the problem.

1. (10 Marks) A recent study at a university concluded that the distribution for the number of soft drinks consumed by students per week on campus is uniformly distributed. A random sample of $n = 300$ students produced the following data:

x = drinks	0	1	2	3	4	5
number of students	55	60	50	45	50	40

Test this claim at 1% significance level.

2. (12 Marks) A study was recently conducted in which people were asked to indicate which new medium was their preferred choice for national news. The following data were observed:

	radio	television	newspaper	total
under 21	30	50	5	85
21-40	20	25	30	75
41 and over	30	30	50	110
total	80	105	85	270

Given this data, we wish to test whether the preferred news source is independent of age, use 5% level of significance.

3. (18 Marks) A nation job placement company is interested in developing a model that might be used to explain the variation in starting salaries (in thousand dollars) for college graduates based on the college GPA. The following data were collected through a random sample of the clients with which this company has been associated.

GPA (X)	3.2	3.4	2.9	3.6	2.8	2.5	3.0	3.6	2.9	3.5
Starting salary (Y)	35.0	29.5	30.0	36.4	31.5	29.0	33.2	37.6	32.0	36.0

You may use the following results:

$$\sum x = 31.4, \quad \sum y = 330.20, \quad \sum x^2 = 99.88, \quad \sum y^2 = 10989.46, \quad \sum xy = 1044.8,$$

$$SSE = 36.7873$$

- a) Plot the scatter and comment on the relation between the GPA and the starting salary.



Comment

b)

I. Find the correlation coefficient between the two variables,

II. Test the hypothesis that there is no linear relation between the two variables.

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- c) Find the equation for predicting the salary using the GPA. What is your prediction for the salary if GPA is 3.9?
- d) Test the hypothesis that the value of the slope is more than 5
- e) Find a 95% confidence interval to estimate the mean salary if the GPA is 3.9.

4. (10 Marks) An electric Company wants to estimate the relationship between the daily summer temperature in degrees Fahrenheit and the amount of electricity used by its customers in millions of kilowatts. A random sample of temperature and resulting amount of electricity used were collected and analyzed using Minitab as shown in the next page, use the Minitab output to answer the following questions:

a) Find the correlation coefficient between the temperature and the amount of electricity used and comment on your finding.

b) Find a 95% confidence interval for the slope and use your finding to test the significance of the regression model. Give your conclusion.

c) What are the assumptions that you need to answer par **b**?

Regression Analysis: Elect versus Temp

The regression equation is
 Elect = 6.28 + 0.193 Temp

Predictor	Coef	SE Coef	T	P
Constant	6.284	1.826	3.44	0.004
Temp	0.19280	0.01971	9.78	0.000

S = 0.6873 R-Sq = 88.0% R-Sq(adj) = 87.1%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	45.215	45.215	95.72	0.000
Residual Error	13	6.141	0.472		
Total	14	51.356			

Unusual Observations

Obs	Temp	Elect	Fit	SE Fit	Residual	St Resid
5	84	24.200	22.479	0.240	1.721	2.67R

R denotes an observation with a large standardized residual