**Statistics Problems**

For these problems, please use Excel to show your work, and submit the Excel spreadsheet along with your completed assignment.

1. For the following problems, state the null and alternate hypothesis, find the chi-square test statistic, decide whether to reject or fail to reject the null hypothesis, and provide your analysis and conclusions.
2. Results from a survey five years ago that asked how long they had to wait in the waiting room to see their doctor. You randomly selected 250 people and asked them how long they had to wait in the waiting room. Can you conclude at sig. of .01 that there has been a change in claimed or expected distribution?
3. Results from a previous survey asked baseball players on a high school team what they needed help with the most in baseball. To determine whether the distribution is the same, a researcher studied 125 randomly selected players and asked them what they needed the most help with. The results are shown below. At a sig. of .05 are the distributions the same?

1. For the following problems, find the expected frequencies of each cell in the table, perform a chi-square test for independence, and comment on the relationship between the variables. Assume the variables are independent.
2. The contingency table shows the results of a random sample of college professors and the years of teaching at the university level.
3. The contingency table shows the results of a random sample of individuals by gender and gas mileage of vehicle owned.
4. The table below shows the raw score for reading comprehension on a college entrance exam for 7 randomly selected male students and 10 randomly selected female students. Assuming that the entrance exam test scores are normally distributed, at a sig. of .05, test the claim that the test score variance for females is different from the males.
5. In the following problems, use the given sample data to perform a one-way ANOVA test using a .05 level of significance. What are your conclusions? Assume the sample is drawn from a normal population, the samples are independent, and the populations have the same variances
6. The table shows the average annual cost of high speed internet access in dollars for a random sample of individuals in four different regions of a state.
7. The table shows the annual income for a random sample of individuals in four regions of a state.
8. **Application:** Create a data set of your own regarding something of interest to you. Populate the data set with sample data (at least 10 records). Use your sample data set to perform a one-way ANOVA test using a .05 level of significance. What are your conclusions? Assume the sample is drawn from a normal population, the samples are independent, and the populations have the same variances.

**Problem:** The Stats Professor wants to compare the means of the grades of the Stat Test of the 4 classes he is teaching at Hofstra University. The recoreded results are in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| Class 1 | Class 2 | Class 3 | Class 4 |
| 70 | 90 | 74 | 94 |
| 72 | 83 | 77 | 67 |
| 75 | 62 | 89 | 73 |
| 77 | 77 | 69 | 75 |
| 80 | 70 | 60 | 59 |
| 67 | 73 |   | 62 |
|   | 74 |   |   |

1. For the following problems, identify the claim and state the null and alternate hypotheses, determine the critical value, find the test statistic, determine whether to reject or fail to reject the null hypothesis, and interpret the decision in the context of the original claim.
	1. The store manager claims that the median number of customers per day through the checkout lines is no more than 225. A sample of customers per day through the checkout lines over 15 days is listed below. At .05 can you reject the manager’s claim?

215 224 261 208 194 198 230 216

213 200 154 223 210 174 187

* 1. A loan officer at a bank maintains that the median credit rating of its customers pursuing a mortgage loan is at least 695. The credit scores for 20 randomly selected mortgage loan customers is listed below. At .05 can you reject the loan officer’s claim?

617 695 706 631 711 625 653 612 707

719 605 619 621 699 644 665 697 609

687 711

* 1. A local police agency states that the median ticket cost for a speeding ticket issued is $185. In a random sample of 35 speeding tickets, the data is below. Can you reject the claim that the median ticket cost for a speeding ticket is $185?

 154 158 135 157 185 100 178 140 177 97 111 99 115 156 147 102 140 175 185 114 142 128 224 159 131 187 167 145 120 218 195 201 130 194 221

1. For the following, determine whether the samples are dependent or independent, and choose the appropriate Wilcoxon test, state the null and alternate hypothesis, determine the critical values, find the test statistic, state whether you reject or fail to reject the null hypothesis, and explain your answer.

	1. A college estimates the number of semesters it takes to complete a bachelor’s degree differs by gender. The table shows 10 male and 10 female students (randomly selected) and the number of semesters to complete the degree.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Male | 18 | 17 | 15 | 20 | 16 | 20 | 18 | 16 | 17 | 19 |
| Female | 16 | 17 | 17 | 16 | 18 | 20 | 21 | 18 | 19 | 16 |

 the distribution of difference scores in the population is symmetric about zero between males and females

 the distribution of difference scores in the population is different between males and females

1. For the following use the Spearman rank correlation coefficient to test the claim. Identify and state the null and alternate hypothesis, find the test statistic, decide whether to reject the null hypothesis, and form an analysis of your findings.

	1. Overall scores and the prices for 11 randomly selected flat screen televisions. The score is based on overall quality of the television. At a .05 sig. can you conclude there is a correlation between price and score?