**1**. Hugger Polls contends that an agent conducts a mean of 53 in-depth home surveys every week. A streamlined survey form has been introduced, and Hugger wants to evaluate its effectiveness. The number of in-depth surveys conducted during a week by a random sample of agents are:

53 57 50 55 58 54 60 52 59 62 60 60 51

59 56

At the .05 level of significance, can we conclude that the mean number of interviews conducted by the agents is more than 53 per week? Use a standard deviation of 3.7378. If you use Excel or Megastat, embed the spreadsheet/worksheet into this exercise.

a. Set up the null hypothesis and alternative hypothesis.

b. State the decision rule.

c. Show calculations for the test statistic.

|  |  |
| --- | --- |
| Place your answer (only the value) to the test statistic in the box to the right: |  |

d. What is your decision?

**2.** Mary Jo Fitzgerald is the Vice President for Nursing Services at St. Luke’s Memorial Hospital. Recently she noticed in the job postings for nurses that those that are unionized seem to offer higher wages. She decided to investigate and gathered the following sample information. The level of significance is 0.02 which is equivalent to a critical value of 2.05. If you use Excel or Megastat, embed the spreadsheet/worksheet into this exercise.

|  |  |  |  |
| --- | --- | --- | --- |
| Group | Mean Wage | Sample Standard Deviation | Sample Size |
| Union | $20.75 | $2.25 | 40 |
| Non-union | $19.80 | $1.90 | 45 |

a. Set up the null hypothesis and alternative hypothesis.

b. State the decision rule.

c. Show calculations for the test statistic.

|  |  |
| --- | --- |
| Place your answer (only the value) to the test statistic in the box to the right: |  |

d. What is your decision?

1. The publisher of a sports magazine plans to offer new subscribers one of three gifts: a sweatshirt with a logo of their favorite team, a coffee cup with the logo of their favorite team, or a pair of earrings also with the logo of their favorite team. In a sample of 500 new subscribers, the number selecting each gift is reported following. At the 0.05 significance level, is there a preference for the gifts or should we conclude that the gifts are equally liked? If you use Excel or Megastat, embed the spreadsheet/worksheet into this exercise.

|  |  |
| --- | --- |
| Gift | Number of Selections |
| Sweatshirt | 183 |
| Coffee Cup | 175 |
| Earrings | 142 |

a. Set up the null hypothesis and alternative hypothesis.

b. State the decision rule.

c. Show calculations for the test statistic.

|  |  |
| --- | --- |
| Place your answer (only the value only) to the test statistic in the box to the right: |  |

d. What is your decision?

4. A physician who specializes in weight control has three different diets she recommends. As an experiment, she randomly selected 15 patients and then assigned 5 to each diet. After three weeks, the following weight losses, in pounds, were noted. At the .05 significance level, can she conclude that there is a difference in the mean amount of weight loss among the three diets?

|  |  |  |
| --- | --- | --- |
| Plan A | Plan B | Plan C |
| 5 | 6 | 7 |
| 7 | 7 | 8 |
| 4 | 7 | 9 |
| 5 | 5 | 8 |
| 4 | 6 | 9 |

1. State the null hypothesis and alternative hypothesis.
2. What is the decision rule?

c. Read this carefully. Complete an ANOVA table by using Excel or Megastat. Copy and paste your Excel or Megastat worksheet that shows the ANOVA table for this exercise.

d. What is your decision about Ho?

**5.** The production department of NDB Electronics wants to explore the relationship between the number of employees who assemble a subassembly and the number of products produced. As an experiment, two employees were assigned to assemble the subassemblies. They produced 15 during a one-hour period. Then four employees assembled them. They produced 25 during a one-hour period. The complete set of paired observations follows:

|  |  |
| --- | --- |
| Number of Assemblers | One-Hour  Production (units) |
| 2 | 15 |
| 4 | 25 |
| 1 | 10 |
| 5 | 40 |
| 3 | 30 |

Using Excel or Megastat, copy and paste the worksheet, and type in the responses in the following two boxes.

1. Determine the correlation coefficient.

|  |  |
| --- | --- |
| Place your answer (only the value) in the box to the right: |  |

1. Determine the coefficient of determination.

|  |  |
| --- | --- |
| Place your answer (only the value) in the box to the right: |  |