Introduction CJ Data Analysis

Homework #3

One Sample t-tests

QUESTION #1

One of the most contentious contemporary debates in educational policy is the relative efficacy of charter-vs-public schools. The average graduation rate in the Newark Public Schools is 55%. You compile the graduation rate in 10 charter schools and noticed that their gradation rate is 65%, with a standard deviation of 13. Are the charter schools more successful in graduating their students than public schools in the City of Newark, NJ?

* What are the null and alternative hypotheses for this test?
* Is this a one-tail or two-tail test? Explain your choice
* What is the level of significance of this test (use 0.01)?
* How many degrees of freedom are there?
* What is the critical value of the t-statistic?
* Draw a normal curve, enter the critical value on the normal curve you have just drawn, and shade the rejection region.
* Compute the value of the t-statistic.
* Enter the t-value you have just computed on the normal curve you drew in (6)
* Should we reject the null hypothesis? Why or why not?
* What is your conclusion

QUESTION #2

A study conducted by a Research Institute in America revealed that the average number of hours prison inmates spend in their cells each day is 15. You conduct your own study in 7 New Jersey prisons and jails and came up with the following sample data

|  |  |
| --- | --- |
| Facility # | Hours spent in cells per day |
| 1 | 16.3 |
| 2 | 21.1 |
| 3 | 14.9 |
| 4 | 13.5 |
| 5 | 22.2 |
| 6 | 15.3 |
| 7 | 18.1 |

Test the hypothesis that the numbers of hours New Jersey prisoners spend in their jail cells is significantly different from the national average.

* + - What are the null and alternative hypotheses for this test?
    - Is this a one-tail or two-tail test? Explain your choice
    - What is the level of significance of this test (use 0.01)?
    - How many degrees of freedom are there?
    - What is the critical value of the t-statistic?
    - Draw a normal curve, enter the critical value on the normal curve you have just drawn, and shade the rejection region.
    - Compute the value of the t-statistic.
    - Enter the t-value you have just computed on the normal curve you drew in (6)
    - Should we reject the null hypothesis? Why or why not?
    - What is your conclusion

QUESTION #3

The National Rifle Association contends that the average American household contains 3 firearms. You take a random sample of 200 households in Newark and noticed the average number of firearms is 3.3, with a standard deviation of 1.1. Are the Newark households significantly more likely to own firearms than the rest of the country?

* What are the null and alternative hypotheses for this test?
* Is this a one-tail or two-tail test? Explain your choice
* What is the level of significance of this test (use 0.05)?
* How many degrees of freedom are there?
* What is the critical value of the t-statistic?
* Draw a normal curve, enter the critical value on the normal curve you have just drawn, and shade the rejection region.
* Compute the value of the t-statistic.
* Enter the t-value you have just computed on the normal curve you drew in (6)
* Should we reject the null hypothesis? Why or why not?
* What is your conclusion