1. Review the movie data in the following table.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gender** | **Trailer**  **Type** | **Ratings** | | | | | **Sample** **Size** | **Mean** |
| **1** | **2** | **3** | **4** | **5** |
| Male | A | 8 | 7 | 8 | 6 | 4 | 5 | 6.6 |
| Male | B | 4 | 6 | 4 | 5 | 4 | 5 | 4.6 |
| Female | A | 3 | 4 | 1 | 2 | 4 | 5 | 2.8 |
| Female | B | 6 | 7 | 5 | 4 | 7 | 5 | 5.8 |

State the hypotheses to test the main effects of gender.

State the hypotheses to test the main effects of trailer type.

Calculate the test statistic and p-value to test the main effects of gender.

Calculate the test statistic and p-value to test the main effects of trailer type.

State the conclusion of both these tests at the 0.05 level of significance.

1. Given the following data where patients with high blood pressure are given a drug that is thought to lower their blood pressure. The before amounts represent their blood pressure before taking the medicine. The after amounts represent their blood pressure after taking the medicine for three months:

|  |  |  |
| --- | --- | --- |
| **Subject** | **Before** | **After** |
| 1 | 140 | 140 |
| 2 | 148 | 140 |
| 3 | 146 | 138 |
| 4 | 154 | 152 |
| 5 | 142 | 144 |
| 6 | 151 | 148 |
| 7 | 140 | 138 |
| 8 | 148 | 146 |
| 9 | 146 | 148 |
| 10 | 154 | 150 |
| 11 | 142 | 140 |
| 12 | 151 | 148 |
| 13 | 153 | 150 |

State why a sign test for matched pairs would be appropriate for this example.

Set up the hypotheses to determine if the claim is that the medicine helps to reduce blood pressure.

Calculate the test statistic and p-value for this example.

What would your conclusion be at the 0.05 level of significance?

1. The number of offspring that female blue whales have follows a skewed right distribution. Fifty years ago, researchers tagged ten female blue whales from birth and are counted how many offspring each had over their lifetime. Now researchers want to get similar data to determine if the average number of offspring may be decreasing due to global warming or other environmental changes.

For this example, discuss why an approach using nonparametric statistics would be appropriate.

For this example, what specific test might you use to test whether the average number of offspring has changed over the years? Why would you use this specific type of test?

Describe a brief scenario where you may need to use nonparametric statistics in your daily life.