**The Difference Between High Spring and Fall Temperatures at Lancer Park**

By looking at the results of a study done by Longwood Environmental Observatory (LEO), we are trying to test the difference between the high temperatures in degrees Celsius in the spring and fall seasons at Lancer Park. We chose to investigate the difference in the high temperatures because it is what typically effects the day of residents of Lancer Park, who are students of Longwood University and must know how to prepare for their time on campus for that day. Our parameter is the average difference and high temperature in degrees Celsius at Lancer Park, in which we will be subtracting the fall high temperatures from the spring high temperatures.

There was a difference in the average high temperatures in spring and fall, we choose to use a t-test. We could determine to use the t-test because we are testing a hypothesis, there is a pairwise relationship, we are testing a mean, and the population standard deviation, or sigma was unknown. Also, we were told that the data was a simple random sample. We could determine that there were no outliers by creating a box plot of the values of the difference. We also determined that the data was close to normal by creating a histogram. Regardless, this data comes from a reliable source. Therefore, all conditions were met.

The null hypothesis was µ is equal to zero, and the alternative hypothesis was µ is not equal to zero because if there is no difference between the high temperatures in spring and fall, the result of their subtraction should be zero, considering that they should be the same temperature. Our statistics used in this test were µ0 was zero, x bar, which is the sample mean, was -1.9616, the sample standard deviation S was 8.6308, and n was 25. We chose a significance level of .01. After running the t test, we found a t of -1.1364, which immediately showed that there was a difference in the data due to it being a significant negative value. Our p-value was .2670, which was significantly greater than .01. Therefore, we accepted the alternative hypothesis. There is significant evidence that there is a difference between the high spring and fall temperatures at Lancer Park.

In finding the results of our test, we can apply them to better inform students about the said seasons. First, we could convert the data to Fahrenheit so that it could be better understood by the public. Then, looking at the negative t value we found, we could conclude that because we subtracted fall high temperatures from spring high temperatures, the negative value shows how fall temperatures are typically higher than spring temperatures. This finding is important so we can inform students what clothes to bring back to their apartments in accordance to the typical temperatures of that season, spring or fall. This is especially important considering that most students living at Lancer Park would be those who live an hour or more away from campus.

Overall, the results of this t test can help us to better estimate what the temperature may be in future spring and fall seasons at Lancer Park.

Appendix

HIGH (°C) HIGH (°C)

|  |  |  |  |
| --- | --- | --- | --- |
| spring | 27.99 | fall | 26.54 |
| spring | 25.7 | fall | 19.07 |
| spring | 24.86 | fall | 16.08 |
| spring | 26.14 | fall | 26.08 |
| spring | 16.01 | fall | 7.88 |
| spring | 29.36 | fall | 17.71 |
| spring | 20.45 | fall | 28.84 |
| spring | 23.27 | fall | 29.72 |
| spring | 12.51 | fall | 22.73 |
| spring | 29.83 | fall | 31.04 |
| spring | 16.72 | fall | 20.6 |
| spring | 21.63 | fall | 19.23 |
| spring | 11.77 | fall | 20.23 |
| spring | 30.51 | fall | 30.76 |
| spring | 19.68 | fall | 29.91 |
| spring | 23.27 | fall | 24.81 |
| spring | 8.89 | fall | 27.08 |
| spring | 19.17 | fall | 31.99 |
| spring | 20.81 | fall | 19.71 |
| spring | 5.2 | fall | 21.13 |
| spring | 15.04 | fall | 18.55 |
| spring | 16.52 | fall | 28.22 |
| spring | 23.8 | fall | 18.43 |
| spring | 23.27 | fall | 9.27 |
| spring | 26 | fall | 21.83 |