Scenario

You have been hired by the Regional Real Estate Company to help them analyze real estate data. One of the company's Pacific region salespeople just returned to the office with a newly designed advertisement. It states that the average cost per square foot of his home sales is above the average cost per square foot in the Pacific region. He wants you to make sure he can make that statement before approving the use of the advertisement. The average cost per square foot of his home sales is $275. In order to test his claim, you collect a sample of 1,001 home sales for the Pacific region.

Prompt

Design a hypothesis test and interpret the results using significance level α = .05.

Use the House Listing Price by Region document to help support your work on this assignment. You may also use the Descriptive Statistics in Excel and Creating Histograms in Excel tutorials for support.

Specifically, you must address the following rubric criteria, using the Module Five Assignment Template.

- **Setup:** Define your population parameter, including hypothesis statements, and specify the appropriate test.
    - Define your population parameter.
    - Write the null and alternative hypotheses. Note: Remember, the salesperson believes that his sales are higher.
    - Specify the name of the test you will use.
        - Identify whether it is a left-tailed, right-tailed, or two-tailed test.
    - Identify your significance level.
- **Data Analysis Preparations:** Describe sample summary statistics, provide a histogram and summary, check assumptions, and find the test statistic and significance level.
    - Provide the descriptive statistics (sample size, mean, median, and standard deviation).
    - Provide a histogram of your sample.
    - Describe your sample by writing a sentence describing the shape, center, and spread of your sample.
    - Determine whether the conditions to perform your identified test have been met.
- **Calculations:** Calculate the p value, describe the p value and test statistic in regard to the normal curve graph, discuss how the p value relates to the significance level, and compare the p value to the significance level to reject or fail to reject the null hypothesis.
    - Determine the appropriate test statistic, then calculate the test statistic.
      Note: This calculation is (mean − target)/standard error. In this case, the mean is your regional mean (Pacific), and the target is 275.
    - Calculate the *p* value.
      Note: For right-tailed, use the T.DIST.RT function in Excel, left-tailed is the T.DIST function, and two-tailed is the T.DIST.2T function. The degree of freedom is calculated by subtracting 1 from your sample size.
      Choose your test from the following:
      =T.DIST.RT([test statistic], [degree of freedom])
      =T.DIST([test statistic], [degree of freedom], 1)
      =T.DIST.2T([test statistic], [degree of freedom])
    - Using the normal curve graph as a reference, describe where the p value and test statistic would be placed.
- **Test Decision:** Discuss the relationship between the p value and the significance level, including a comparison between the two, and decide to reject or fail to reject the null hypothesis.

- Discuss how the *p* value relates to the significance level.
- Compare the *p* value and significance level, and make a decision to reject or fail to reject the null hypothesis.

- **Conclusion:** Discuss how your test relates to the hypothesis and discuss the statistical significance.
  - Explain in one paragraph how your test decision relates to your hypothesis and whether your conclusions are statistically significant.

Guidelines for Submission

Submit the completed Module Five Assignment Template as a Word document that includes your response and supportive charts.

Module Five Assignment Rubric

Criteria	Exemplary (100%)	Proficient (85%)	Needs Improvement (55%)	Not Evident (0%)	Value
Setup	Exceeds proficiency in an exceptionally clear manner	Defines the population parameter, including hypothesis statements, and specifies the appropriate test	Shows progress toward proficiency, but with errors or omissions; areas for improvement may include inaccurate or incomplete components	Does not attempt criterion	20
Data Analysis Preparations	Exceeds proficiency in an exceptionally clear manner	Describes the sample summary statistics, provides a histogram and summary, checks assumptions, and finds the test statistic and significance level	Shows progress toward proficiency, but with errors or omissions; areas for improvement may include inaccurate or missing elements	Does not attempt criterion	15
Calculations	Exceeds proficiency in an exceptionally clear manner	Calculates the p value, describes the p value and test statistic in regard to the normal curve graph	Shows progress toward proficiency, but with errors or omissions; areas for improvement may include inaccurate calculations or missing elements	Does not attempt criterion	15
Test Decision	Exceeds proficiency in an exceptionally clear manner	Discusses how the p value relates to the significance level, and compares the p value to the significance level to reject or fail to reject the null hypothesis	Shows progress toward proficiency, but with errors or omissions; areas for improvement may include inaccurate or cursory discussion	Does not attempt criterion	20

Criteria	Exemplary (100%)	Proficient (85%)	Needs Improvement (55%)	Not Evident (0%)	Value
Conclusion	Exceeds proficiency in an exceptionally clear manner	Discusses how the test relates to the hypothesis and discusses the statistical significance	Shows progress toward proficiency, but with errors or omissions; areas for improvement may include conclusions that are cursory or missing critical elements	Does not attempt criterion	20
Articulation of Response	Exceeds proficiency in an exceptionally clear manner	Clearly conveys meaning with correct grammar, sentence structure, and spelling, demonstrating an understanding of audience and purpose	Shows progress toward proficiency, but with errors in grammar, sentence structure, and spelling, negatively impacting readability	Submission has critical errors in grammar, sentence structure, and spelling, preventing understanding of ideas	10
				Total:	100%