

## 15.3.9: Chapter 10 Lab

### One Population Hypothesis Testing

Year	Year of Sale
Price	Sale price in \$Thousands
Bedrooms	Number of bedrooms
SqrFeet	Size of home in 100's of square feet
Pool	Does a home have a pool ? (Yes/No)
Garage	Does a home have a garage? (Yes/No)
Bath	Number of Bathrooms
Distance	Distance in miles from city center
City	City Region (Fresno, Los Angeles, Sacramento, San Francisco, San Jose)
School	School District Rating (Poor, Fair, Good , Excellent)

- You want to conduct a hypothesis test about the mean home prices in California using the housing data file: housing.mpj. At the 1% significance level, design the test for the hypothesis that the mean housing price is over \$850,000.
  - First create a dotplot for the price data, and paste the results here. Does the value \$850,000 seem to be at the center of the data, above the center of the data, or below the center of the data?
  - State the null and alternative hypotheses in words.
  - State the null and alternative hypotheses in population parameters.
  - What model are you choosing and what assumptions are needed? Do you think the skewness and high outlier are a problem in choosing this model?
  - Conduct the test at a significance level of 1%, using MINITAB command Stat>Basic Statistics>1 Population  $t$ -test. Make sure you choose options to set  $H_a$ . Paste the results here. All price data is in \$thousands, so you would enter \$850,000 as 850.
  - Do you reject or fail to reject  $H_o$ ?
  - State your conclusion in the context of the problem.
  - Using the online or Minitab power calculator, determine the power of the test if the population mean is really \$900,000. Assume the standard deviation is \$450,000. (Remember the data is entered in \$ thousands).
  - Using the online or Minitab power calculator, determine the sample size needed to have 95% power for the test.
- You want to conduct a hypothesis test about the standard deviation of home prices in California using the housing data file: housing.mpj. At the 5% significance level, design a test to support the claim that the standard deviation housing price is not \$400,000.
  - State the null and alternative hypotheses in words.
  - State the null and alternative hypotheses in population parameters.
  - What model are you choosing and what assumptions are needed?
  - Conduct the test at a significance level of 5%, using MINITAB command Stat>Basic Statistics>1 Variance. Make sure you choose options to set  $H_a$ . Paste the results here.
  - Do you reject or fail to reject  $H_o$ ?
  - State your conclusion in the context of the problem.
- For the housing data above, we want to support the claim that the percentage of homes in California with garages is over 60%. We are going to conduct a Hypothesis Test using a significance level of 10%.
  - State the null and alternative hypotheses in words.
  - State the null and alternative hypotheses in population parameters.

- c. Create a bar chart of garages and under Chart Option, click the box to show  $y$  as a percentage. Does the bar graph support the claim that more than 60% of homes have garages?
- d. What model are you choosing and what assumptions are needed?
- e. Using the online power calculator, determine the power of the test if the population proportion under  $H_a$  is 0.65
- f. Conduct the test at a significance level of 5%, using MINITAB command Stat>Basic Statistics>1 Proportion. Make sure you choose options to set  $H_a$ . Paste the results here.
- g. Do you reject or fail to reject  $H_o$ ?
- h. State your conclusion in the context of the problem.

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