1. A sample of 87 professional working women showed that the average amount paid annually into a private pension fund per person was $3,352. The population standard deviation is $1,100. A sample of 76 professional working men showed that the average amount paid annually into a private pension fund per person was $5,727, with a population standard deviation of $1,700. A women’s activist group wants to prove that women do not pay as much per year as men into private pension funds. If they use α = 0.01 and these sample data, will they be able to reject a null hypothesis that women annually pay the same as or more than men into private pension funds?
2. Suppose you own a plumbing repair business and employ 15 plumbers. You are interested in estimating the difference in the average number of calls completed per day between two of the plumbers. A random sample of 40 days of plumber A’s work results in a sample average of 5.3 calls, with a population standard deviation of 1.99. A random sample of 37 days of plumber B’s work results in a sample mean of 6.5 calls, with a population variance of 2.36.
3. Is it possible that for these populations of days, the average number of calls completed between plumber A and plumber B do not differ?
4. Two processes in a manufacturing line are performed manually: operation A and operation B. A random sample of 50 different assemblies using operation A shows that the sample average time per assembly is 8.05 minutes, with a population standard deviation of 1.36 minutes. A random sample of 38 different assemblies, with a population standard deviation of 1.06 minutes. For 10% level of significance, is there enough evidence in these samples to declare that operation A takes significantly longer to perform than operation B?
5. Suppose a Realtor is interested in comparing the asking prices of midrange homes in Peoria, Illinois, and Evansville, Indiana. The Realtor conducts a small telephone survey in the two cities, asking the prices of midrange homes. A random sample of 21 listing in Peoria resulted in a sample average pricing of $116,900, with a standard deviation of $2,300. A random sample of 26 listings in Evansville resulted in a sample average price of $114,000, with a standard deviation of $1,750. The Realtor assumes prices of midrange homes are normally distributed and the variance in prices in the two cities is about the same.
6. Test whether there is any difference in the mean prices of midrange homes of the two cities for 10 percent significance level.
7. Based on an indication that mean daily car rental rates may be higher for Boston than for Dallas, a survey of eight car rental companies in Boston is taken and the sample mean car rental rate is $47, with a standard deviation of $3. Further, suppose a survey of nine car rental companies in Dallas results in a sample mean of $44 and a standard deviation of $3. Use 5 percent significant level to test to determine whether the average daily car rental rates in Boston are significantly higher than those in Dallas.; assumes car rental rates are normally distributed and the population variances are equal.
8. Let us revisit the hypothetical study discussed earlier in the section in which consumers are asked to rate a company both before and after viewing a video on the company twice a day for a week. Ratings of company on a scale of 0 to 50 from 7 individuals are present in the table. Use an alpha of 0.05 to test to determine whether there is a significant increase in the ratings are normally distributed in the population.

|  |  |  |
| --- | --- | --- |
| Individual | Before | After |
| 1 | 32 | 39 |
| 2 | 11 | 15 |
| 3 | 21 | 35 |
| 4 | 17 | 13 |
| 5 | 30 | 41 |
| 6 | 38 | 39 |
| 7 | 14 | 22 |

1. A nationally known supermarket decided to promote its own brand of soft drinks on TV for two weeks. Before the ad campaign, the company randomly selected 21 of its stores across the United States to be part of a study to measure the campaign’s effectiveness. During a specified half-hour period on a certain Monday morning, all the stores in the sample counted the number of cans of its own brand of soft drink sold. After the campaign, a similar count was made. The average difference wan an increase of 75 cans, with a standard deviation of difference of 30 cans. Using this information
2. Use 10% level of significance to test the effectiveness of the ad campaign on TV.
3. The vice president of marketing brought to the attention of sales managers that most of the company’s manufacturer representatives contacted clients and maintained client relationships in a disorganized, haphazard way. The sales managers brought the reps in for a three-day seminar and training session on how to use an organizer to schedule visits and recall pertinent information about each client more effectively. Sales reps were taught how to schedule visits most efficiently to maximize their efforts. Sales managers were given data on the number of site visits by sales reps on a randomly selected day both before and after the seminar. Use the following data to test whether significantly more site visits were made after the seminar (α = 0.05). Assume the differences in the number o site visits are normally distributed.

|  |  |  |
| --- | --- | --- |
| Individual | Before | After |
| 1 | 2 | 4 |
| 2 | 4 | 5 |
| 3 | 1 | 3 |
| 4 | 3 | 3 |
| 5 | 4 | 3 |
| 6 | 2 | 5 |
| 7 | 2 | 6 |
| 8 | 3 | 4 |
| 9 | 1 | 5 |

1. According to a study conducted for Gateway Computers, 59% of men and 70% of women say that weight is an extremely/very important factor in purchasing a laptop computer. Suppose this survey was conducted using 374 men and 481 women. Do these data show enough evidence to declare that a significantly higher proportion of women than men believe that weight is an extremely/very important factor in purchasing a laptop computer? Use a 5% level of significance.
2. A large production facility uses two machines to produce a key part for its main product. Inspectors have expressed concern about the quality of the finished product. Quality control investigation has revealed that the key part made by the two machines is defective at times. The inspector randomly sampled 35 units of the key part from each machine. Of those produced by machine A, five were defective. Seven of the 35 sampled parts from machine B were defective. The production manager is interested in estimating the difference in proportions of the populations of parts that are defective between machines A and machine B.
3. Conduct the hypothesis testing to test whether the proportion of defective items produced by two machines are different.
4. According to a CCH Unscheduled Absence survey, 9% of small businesses use telecommunicating of workers in an effort to reduce unscheduled absenteeism. This proportion compares to 6% for all businesses. Is there really a significant difference between small businesses and all businesses on this issue? Use these data and an alpha of 0.10 to test this question. Assume that there were 780 small businesses and 915 other businesses in this survey.
5. Does age make a difference in the amount of savings a worker feels is needed to be secure at retirement? A study by CommSciences for Transamerica asset Management found that 0.24 of workers in the 25 – 33 age category feel that $250,000 to $500,000 is enough to be secure at retirement. However, 0.35 of the workers in the 34 – 52 age category feel that this amount is enough. Suppose 210 workers in the 25 -33 age category and 176 workers in the 34 – 52 age categories were involved in this study. Do you think that there is enough evidence in the data to show that higher proportion of people belonging to age groups of 34 – 52 feels so compared to age groups 25 – 33 at 5 percent level of significance?