**Assignment-ME06**

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| **Problem:1)** Nike shoes come with an average price of $ 150 a piece, at their factory outlet with a std. deviation of $ 25. But at the Puma outlets of these shoes, it was also drawing good crowds where the average price, after discount, was $ 110 and std deviation of $ 15. (Assume the distributions are both Normal). |
| Three specific segments of customers can be expected to form, as a result. One below the lowest price tag of the Nike (segment-I), one above the uppermost price level of the Puma (segment-II) and the third (segment-III) in between. |
| If the market size of this brand Nike was decided at 25,000 pieces and another 30,000 pieces for Puma Sale, how many pieces of shoes (out of this total of 55,000 pieces) can be ascertained for each of the above three market segments? Hint: Some pieces will be picked by consumers only at Nike outlets. Some by customers only at Puma. The remaining can be picked up by customers in both outlets. Draw appropriate diagrams and clearly illustrate decision-making zones   1. Draw a neat diagram. 2. What percentage of Puma dealers are pricing their Model at less than the price for Nike? And what is the size of this segment. 3. What percentage of Nike dealers are pricing their model higher than the price of Puma? Also give size. 4. What is percentage of customers who wish to buy Nike may shift their preference to Puma, if Puma is able to pull those customers with some special deal.   **Problem:2)** In a manufacturing plant, machine A produces 10% of a certain product, machine B produces 40% of this product, and machine C produces 50% of this product. Five percent of machine A products are defective, 12% of machine B products are defective, and 8% of machine C products are defective. The company inspector has just sampled a product from this plant and has found 1000 to be defective. Determine the revised probabilities that the sampled product was produced by machine A, machine B, or machine C and specify the number of defectives to be allocated to each machine.  **Problem:3)** The following table shows the annual returns (in percent) for Fidelity’s Electronic and Utilities funds.   |  |  |  | | --- | --- | --- | | Year | Electronic | Utilities | | 2005 | 13.23 | 9.36 | | 2006 | 1.97 | 32.33 | | 2007 | 2.77 | 21.03 | | 2008 | –50.00 | –35.21 | | 2009 | 81.65 | 14.71 |   a.) Calculate the sample mean, the sample variance, and the sample standard deviation for each fund.  b.) Which fund had the higher average return?  c.) Which fund was riskier over this time period? Use both the standard deviation and the coefficient of variation in your explanation.  d.) Given a risk-free rate of 4%, which fund has the higher Sharpe ratio? What does this ratio imply?  **Problem:4)** The Federal Correction Agency is investigating the last question cited above: Does a male released from federal prison make a different adjustment to civilian life if he returns to his hometown or if he goes elsewhere to live? To put it another way, is there a relationship between adjustment to civilian life and place of residence after release from prison? Use the .01 significance level.  Adjustment to Civilian Life and Place of Residence  https://textflow.mheducation.com/figures/0077416805/Lin21477_tb1508.png  Explain in detail with all the Six steps involved in Hypothesis testing.  **Problem:5)** The following is part of the results of a regression analysis involving sales (Y in millions of dollars), advertising expenditures (X1 in thousands of dollars), and number of salespeople (X2) for a corporation. The regression was performed on a sample of 10 observations.  Coefficient Standard Error t value p value  Constant -11.340 20.412  X1 0.798 0.332 2.404 0.0345  X2 0.141 0.278 0.507 0.2305   1. Write the regression equation. 2. Interpret the coefficients of the estimated regression equation found in Part (a). 3. At α =0.05, test for the significance of the coefficient of advertising. 4. At α =0.05, test for the significance of the coefficient of number of salespeople. 5. If the company uses $50,000 in advertisement and has 800 salespersons, what are the expected sales? Give your answer in dollars.   **Problem:6)** A machine that is programmed to package 1.20 pounds of cereal in each cereal box is being tested for its accuracy. In a sample of 36 cereal boxes, the mean and standard deviation are calculated as 1.22 pounds and 0.06 pound, respectively.   1. Set up the null and the alternative hypotheses to determine if the machine is working improperly—that is, it is either underfilling or overfilling the cereal boxes. 2. Calculate the value of the test statistic. 3. At a 5% level of significance, can you conclude that the machine is working improperly? Explain.   **Problem:7)** A local brewery wishes to ensure that an average of 12 ounces of beer is used to fill each bottle. In order to analyse the accuracy of the bottling process, the bottler takes a random sample of 48 bottles. The sample mean weight and the sample standard deviation of the bottles are 11.80 ounces and 0.8 ounce, respectively.   1. State the null and the alternative hypotheses for the test. 2. Do you need to make any assumption regarding the population for testing? 3. At α = 0.05, specify the critical value(s). What is the decision rule? 4. Make a recommendation to the bottler.   **Problem:8)** A recent study of gender preferences among car shoppers found that men and women equally favour economy cars. A marketing analyst doubts these results. He believes that gender differences exist with respect to the purchase of an economy car. He collects data on 400 recent car purchases cross-classified by Gender and Car Type (economy car versus non-economy car). The results are shown in Table At the 10% significance level, determine whether the sample data support the marketing analyst’s claim. |
| **Problem:1)** The contingency table below summarizes a survey of 1,000 bottled beverage consumers. Find the following probabilities or percentages:   |  |  | | --- | --- | | a. | Probability that a consumer recycles beverage bottles. | | b. | Probability that a consumer who lives in a state with a deposit law does not recycle. | | c. | Percentage of consumers who recycle and live in a state with a deposit law. | | d. | Percentage of consumers in states with a deposit law who recycle.     |  |  |  |  | | --- | --- | --- | --- | |  | *Lives in a state with a deposit law* | *Lives in a state with no deposit law* | *Row Total* | | *Recycles beverage bottles* | 154 | 186 | 340 | | *Does not recycle beverage bottles* | 66 | 594 | 660 | | *Column Total* | 220 | 780 | 1000 | |   **Problem:2)** Analysis of annualized returns over a 10-year period showed that prepaid tuition plans had a mean return of 6.3 percent with a standard deviation of 2.7 percent, while the Standard & Poor's 500 stock index had a mean return of 12.9 percent with a standard deviation of 15.8 percent. (a) Calculate and compare the coefficients of variation. (b) Why would we use a coefficient of variation? Why not just compare the standard deviations?  **Problem:3)** Dolon Web Security Consultants requires all job applicants to submit to a test for illegal drugs. If the applicant has used illegal drugs, the test has a 90 percent chance of a positive result. If the applicant has not used illegal drugs, the test has an 85 percent chance of a negative result. Actually, 4 percent of the job applicants have used illegal drugs. If an applicant has a positive test, what is the probability that he or she has actually used illegal drugs? *A*ssuming 500 job applicants.   |  | | --- | |  | |  | |  |   **Problem:4a)** In a manufacturing plant, machine A produces 10% of a certain product, machine B produces 40% of this product, and machine C produces 50% of this product. Five percent of machine A products are defective, 12% of machine B products are defective, and 8% of machine C products are defective. The company inspector has just sampled a product from this plant and has found 1000 to be defective. Determine the revised probabilities that the sampled product was produced by machine A, machine B, or machine C and specify the number of defectives to be allocated to each machine.  **Problem:4b)** A survey conducted by the S P Jain School of Global Management Report asked 320 companies about the procedures they use in hiring. Only 54% of the responding companies review the applicant’s college transcript as part of the hiring process, and only 44% consider faculty references. Assume that these percentages are true for the population of companies in the MENA region and that 35% of all companies use both the applicant’s college transcript and faculty references.  a. Construct a contingency matrix for this problem and indicate the locations of your  answers for parts (b), (c), and (d) on the matrix.  b. What is the probability that a randomly selected company uses either faculty references or college transcripts as part of the hiring process?  c. What is the probability that a randomly selected company uses either faculty references or college transcript but not both as part of the hiring process?  d. What is the probability that a randomly selected company uses neither faculty references nor college transcript as part of the hiring process?  **Question: 5**   1. Romi, a production manager, is trying to improve the efficiency of his assembly line. He knows that the machine is set up correctly only 60% of the time. He also knows that if the machine is set up correctly, it will produce good parts 80% of the time, but if set up incorrectly, it will produce good parts only 20% of the time. Romi starts the machine and produces one part before he begins the production run. He finds the first part to be good. What is the revised probability that the machine was set up correctly?   **5b)**  Mark the correct one  a) Which of the following represents an appropriate set of hypotheses?  A)  B)  C)  D)   1. If the *p*-value for a hypothesis test is 0.027 and the chosen level of significance is α = 0.05, then the correct conclusion is to   A) not reject the null hypothesis  B) reject the null hypothesis  C) reject the null hypothesis if *σ* = 10  D) not reject the null hypothesis if σ = 10   1. The owner of a large car dealership believes that the financial crisis decreased the number of customers visiting her dealership. The dealership has historically had 800 customers per day. The owner takes a sample of 100 days and finds the average number of customers visiting the dealership per day was 750. Assume that the population standard deviation is 350.To determine whether there has been a decrease in the average number of customers visiting the dealership daily, the appropriate hypotheses are   A)  B)  C)  D)   1. You want to test if more than 20% of homes in a neighbourhood have recently been sold through a short sale, at a foreclosure auction, or by the bank following an unsuccessful foreclosure auction. You take a sample of 60 homes from this neighbourhood and find that 14 fit your criteria. The appropriate null and alternative hypotheses are   A)  B)  C)  D) |
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