

Department of Mathematical Sciences
Rajiv Gandhi Institute of Petroleum Technology, Jais

Tutorial Set - 7

Subject: Statistical Methods & Data Analysis (MA 231)

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1. The average commission charged by full-service brokerage firms on a sale of common stock is \$144, & the S. D. is \$52. Joel Freeland has taken a random sample of 121 trades by his clients and determined that they paid an average commission of \$ 151. At a 0.10 sig. level, can Joel conclude that his client's commissions are higher than the industry average?
2. A company claims that the average change in the value of their stock is \$3.50 per week. An investor believes this average is too high. The investor records the changes in the company's stock price over 30 weeks and finds the average change in the stock price is \$2.60 with a standard deviation of \$1.80. At the 5% significance level, is the average change in the company's stock price lower than the company claims?
3. A paint manufacturer has their production line set-up so that the average volume of paint in a can is 3.78 liters. The quality control manager at the plant believes that something has happened with the production and the average volume of paint in the cans has changed. The quality control department takes a sample of 100 cans and finds the average volume is 3.62 liters with a standard deviation of 0.7 liters. At the 5% significance level, has the volume of paint in a can changed?
4. An instructor wishes to see whether the variance in scores of the 23 students in her class is less than the variance of the population. The variance of the class is 198. Is there enough evidence to support the claim that the variation of the students score is less than the population variance 225 at 5% significance level?
5. The population score of 10-yr. old children in a psychological performance test is known to have a S.D. 5.2. If a random sample of size 20 shows a mean of 16.9 & S.D. 5.8. At 5% sig. level, verify the information that the population S.D. is 5.2.
6. Microsoft estimated last year that 35% of potential software buyers were planning to wait to purchase the new operating system, windows vista, until an upgrade had been released. After an advertising campaign to re-assure the public, Microsoft surveyed 3,000 people and found 950 who were still skeptical. At the 5% sig. level, can the company conclude the proportion of skeptical people has decreased?
7. Two students are interested in whether or not there is variation in their test scores for a math course. There is total 15 tests they have taken so far. The first student's scores have a S.D. of 38.1 and that of the second student is 22.5. The second student feels his scores are less variable than the first. Test his intuition at 5% significance level.
8. Employers want to know which days of the week employees are absent in a five-day work week. Most employers would like to believe that employees are absent equally during the week. Suppose

a random sample of 60 managers were asked on which day of the week they had the highest number of employee absences. The results were distributed as

Days	Monday	Tuesday	Wednesday	Thursday	Friday
Number of Absences	15	12	9	9	15

For the population of employees, do the days for the highest number of absences occur with equal frequencies during a five-day work week? Test at a 5% significance level.

9. A volunteer group, provides from one to nine hours each week with disabled senior citizens. The program recruits among community college students, four-year college students, and nonstudents. A sample of the adult volunteers and the number of hours they volunteer per week is given.

Type of Volunteer	1-3 Hours	4-6 Hours	7-9 Hours	Row Total
Community College Students	111	96	48	255
Four-Year College Students	96	133	61	290
Nonstudents	91	150	53	294
Column Total	298	379	162	839

Is the number of hours volunteered independent of the type of volunteer? Test at a 5% sig. level.