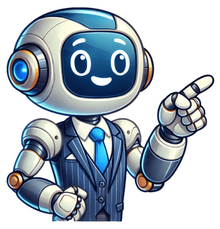
Continue



Use stages to create a historical control chart that shows how a process changes over specific periods of time. By default, Minitab recalculates the center line and control limits for each stage. For more information, go to Add stages to show how a process changed. This historical control chart shows three stages of a process, which represent before, during, and after the implementation of a new procedure. A college professor wants to assess the scores that students earned on a midterm test. The professor records the frequency of each test score. You can use this data to demonstrate Histogram and other analyses that use a frequency column. Worksheet column Description Scores The test scores on a 1 to 100 scale Frequency The number of students who earned each score Download TestScores.MWX A professor wants to recode numeric grade averages (from 0100) to letter grades. The professor wants to recode all averages that are 90 and above to the letter A, averages that are at least 80, but less than 90 to the letter B, and so on. In the column name cell, type Average. Copy and paste, or type the following data into the Average column: 90.1 90.0 89.9 73.1 95.3 70.0 68.5 85.5 80.0 88.5 Choose In Recode values in the following columns, enter Average. From Method, select Recode ranges of values. In the table, enter the following. Lower endpoint Upper endpoint Recoded value 90 101 A 80 90 B 70 80 C 60 70 D 0 60 F From Endpoints to include, select Lower endpoint only. Click OK. The recoded values are in a new column of the worksheet. C1 C2-T Average Recoded Average 90.1 A 90.0 A 89.9 B 73.1 C 95.3 A 70.0 C 68.5 D 85.5 B 80.0 B 88.5 B Use 2 Proportions to do the following when your data contain only two categories, such as pass/fail: Determine whether the population proportions of two groups differ. Calculate a range of values that is likely to include the difference between the population proportions. For example, a market research analyst wants know whether the proportion of consumers who return a survey increases by providing an incentive such as a product sample. To perform a 2 proportions test, choose . An associated variable is a continuous variable that is grouped by categorical variables. In Minitab, you can display summary statistics for associated variables in a table. At the bottom of each table, Minitab displays the Cell Contents, which indicates the statistics and their order in the cell. For summary statistics, you can display the mean, median, minimum, maximum, sum, standard deviation, data value, number of non-missing observations, number of missing observations, proportions of observations equal to a specific value, and proportions of observations between two numbers, for each associated variable. 76.8670.8273.145854541009210011.629.5610.753556910.000000.089290.054950.28570.35710.3297 This table contains statistical summaries for pulse rate, classified by gender. In each cell, Minitab displays the mean, minimum, maximum, standard deviation, number of observations, proportion of values that equal a specified value, and the proportion of values that are within a specified range of values. The columns of the table are as follows: The first column contains the summarized pulse data for females. The second column contains the summarized pulse data for males. The third column contains the summarized pulse data for all study subjects. For all the study subjects, the mean pulse rate is 73.14 beats per minute (bpm). The lowest value is 54 bpm, and the highest value is 100 bpm. The standard deviation is 10.75. The number of study subjects is 91 (35 females and 56 males). 5.495% of the pulse rates are exactly 74 bpm, and 32.97% of the pulse rates range from 70 to 80 bpm. The mean is the average of the data, which is the sum of all the observations divided by the number of observations. For example, the wait times (in minutes) of five customers in a bank are: 3, 2, 4, 1, and 2. The mean waiting time is calculated as follows: On average, a customer waits 2.4 minutes for service at the bank. Use the mean to describe the sample with a single value that represents the center of the data. Many statistical analyses use the mean as a standard measure of the center of the distribution of the data. The median and the mean both measure central tendency. But unusual values, called outliers, can affect the median less than they affect the mean. If your data are symmetric, the mean and median are similar. For the symmetric distribution, the mean (blue line) and median (orange line) are so similar that you can't easily see both lines. But the non-symmetric distribution is skewed to the right. The standard error of the mean (SE Mean) estimates the variability between sample means that you would obtain if you took repeated samples from the same population. Whereas the standard error of the mean estimates the variability between samples, the standard deviation measures the variability within a single sample. For example, you have a mean delivery time of 3.80 days, with a standard deviation of 1.43 days, from a random sample of 312 delivery times. These numbers yield a standard error of the mean of 0.08 days (1.43 divided by the square root of 312). If you took multiple random samples of the same size, from the same population, the standard deviation of those different sample means would be around 0.08 days. Use the standard error of the mean to determine how precisely the sample mean estimates the population mean. A smaller value of the standard error of the mean indicates a more precise estimate of the population mean. Usually, a larger standard deviation results in a larger standard error of the mean and a less precise estimate of the population mean. A larger sample size results in a smaller standard error of the mean and a more precise estimate of the population mean. Minitab uses the standard error of the mean to calculate the confidence interval. Use the mean to describe the sample with a single value that represents the center of the data. Many statistical analyses use the mean as a standard measure of the center of the distribution of the data. The median is another measure of the center of the distribution of the data. The median is usually less influenced by outliers than the mean. Half the data values are greater than the median value, and half the data values are less than the median value. The median and the mean both measure central tendency. But unusual values, called outliers, can affect the median less than they affect the mean. If your data are symmetric, the mean and median are similar. For the symmetric distribution, the mean (blue line) and median (orange line) are so similar that you can't easily see both lines. But the non-symmetric distribution is skewed to the right. In these results, the mean torque that is required to remove a toothpaste cap is 21.265, and the median torque is 20. The data appear to be skewed to the right, which explains why the mean is greater than the median. The Box-Cox transformation estimates lambda values that minimize the standard deviation of W, a standardized transformed variable. The transformation is given by the following formula: where Yi is an original data value and is the parameter for the transformation. Optimal is the value between 5 and 5 that minimizes the standard deviation () of the transformed data. In order to accurately compare for different values of , Minitab calculates standardized transformed values Zi for this comparison, according to the following formula: To estimate for subgroups data, Minitab uses the unbiased estimate of the pooled standard deviation. To estimate for individuals data, Minitab uses the unbiased estimate of the average moving range.NotationTermDescriptionG geometric mean of the original data The following table shows some commonly used values and their transformations. Transformation 2 0.5 0 0.5 1 If a term is statistically significant in Fit General Linear Model or Fit Mixed Effects Model, you know that some pairs of group means are different, but you do not know which pairs differ. Use the grouping information table to determine whether the mean differences between specific pairs of groups are statistically significant. Groups that do not share a letter are significantly different. The number of comparisons that Minitab displays depends on whether you chose Pairwise or With a control when completing the dialog box. In either case, assessing the statistical significance of the differences remains the same. For more information on comparison methods, go to Using multiple comparisons to assess the practical and statistical significance. 3113.11333A 492.84000 B 2132.80667 B 1122.15000 CIn these results, the table shows that only Subject 2 and 4 share a letter. The difference between these two groups is not statistically significant. All of the other subjects do not share a letter, which indicates that those differences are statistically significant.

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