jmp analysis of variance

JMP Analysis of Variance: A Comprehensive Guide

Introduction:

Are you drowning in data and struggling to discern meaningful patterns? Understanding the differences between groups is crucial in many fields, from scientific research to business analytics. Analysis of Variance (ANOVA), a powerful statistical technique, helps you do just that. This comprehensive guide will equip you with the knowledge and practical skills to master JMP's ANOVA capabilities, moving beyond simple explanations to delve into the nuances of interpreting results and troubleshooting common issues. We'll cover everything from setting up your data to interpreting the complex output, ensuring you can confidently leverage JMP's advanced features for robust statistical analysis. By the end of this post, you'll be ready to perform and interpret JMP ANOVA with confidence, uncovering hidden insights within your datasets.

1. Understanding ANOVA and its Applications:

Analysis of Variance (ANOVA) is a statistical method used to test differences between the means of two or more groups. Unlike a t-test, which compares only two groups, ANOVA can handle multiple groups simultaneously, reducing the number of comparisons and controlling for the overall experiment-wise error rate. This makes it incredibly efficient for analyzing experiments with multiple treatment levels or comparing the means of several populations.

There are several types of ANOVA:

One-way ANOVA: Compares the means of multiple groups based on a single independent variable (factor). For example, comparing the yield of three different fertilizers.
Two-way ANOVA: Examines the effects of two independent variables and their interaction on a dependent variable. This allows for investigating whether the effect of one variable changes depending on the level of another. For instance, analyzing the effect of fertilizer and watering frequency on crop yield.
Repeated measures ANOVA: Used when the same subjects are measured multiple times under different conditions. This accounts for the correlation between repeated measurements on the same subject. Imagine testing the same individuals' reaction times under varying levels of stress.

1. Preparing Your Data for JMP ANOVA:

Before diving into the analysis, ensuring your data is properly structured within JMP is paramount. Your data should be organized in a tabular format, with each row representing a single observation and each column representing

a variable. Crucially, you need to clearly define:

Dependent Variable (Y): The variable you're measuring (e.g., crop yield, reaction time). This is usually continuous data.
Independent Variable(s) (X): The factor(s) you believe influence the dependent variable (e.g., fertilizer type, watering frequency). These can be categorical (nominal or ordinal) or continuous.
Grouping Variable(s): This specifies which observations belong to which group defined by your independent variable(s). JMP uses this to partition your data for the ANOVA analysis.

Improper data structuring will lead to incorrect results, so meticulously checking your data layout is crucial.

1. Performing One-Way ANOVA in JMP:

Let's walk through a simple one-way ANOVA example. Assume you're testing the effectiveness of three different teaching methods (Method A, Method B, Method C) on student test scores. In JMP:

1. Import your data: Load your data into JMP, ensuring your columns are correctly designated as numeric or nominal.

2. Analyze > Fit Y by X: Select your dependent variable (Test Scores) as 'Y' and your independent variable (Teaching Method) as 'X'.

3. Interpret the output: JMP will generate an ANOVA table including:

Sum of Squares: Measures the variation within and between groups.
Degrees of Freedom: Reflects the number of independent pieces of information.
Mean Square: Average variation within and between groups.
F-statistic: The test statistic that compares the variance between groups to the variance within groups. A higher F-statistic indicates greater differences between group means.
p-value: The probability of observing your results if there were no real differences between group means. A p-value less than your significance level (typically 0.05) indicates statistically significant differences.

1. Post-hoc tests: If the ANOVA is significant, perform post-hoc tests (e.g., Tukey's HSD) to determine which specific groups differ significantly from each other. JMP provides these options in the ANOVA output.

1. Performing Two-Way and Repeated Measures ANOVA in JMP:

The process for two-way and repeated measures ANOVA is similar, but with the added complexity of multiple independent variables.

Two-way ANOVA: Use the "Fit Model" platform in JMP. This allows you to specify both independent variables and their interaction term. Carefully interpret the results, focusing on the p-values associated with each main effect and the interaction effect.
Repeated Measures ANOVA: JMP's repeated measures analysis requires a different approach, utilizing the "Repeated Measures" platform. You'll need to specify the within-subject factor (repeated measurements) and the between-subject factor(s) (if any). The output will be more complex, requiring careful consideration of the within-subject and between-subject effects.

1. Interpreting JMP ANOVA Output and Reporting Results:

Don't just glance at the p-value! Thoroughly examine the ANOVA table, focusing on:

Effect Sizes: Quantify the magnitude of the differences between group means (e.g., eta-squared, omega-squared). JMP may not directly calculate these, but you can calculate them manually based on the Sum of Squares values.
Assumptions: ANOVA relies on certain assumptions (normality, homogeneity of variances, independence of observations). Check these assumptions using JMP's diagnostic tools (e.g., histograms, normality tests, Levene's test). Violations may require transformations or alternative statistical tests.
Visualizations: Use JMP's graphing capabilities (e.g., box plots, means plots) to visually represent your data and findings. These aids significantly enhance the clarity and understanding of your analysis.

1. Troubleshooting Common JMP ANOVA Issues:

Encountering problems? Common JMP ANOVA issues include:

Unequal sample sizes: This can affect the power of the test. Consider using a weighted ANOVA if necessary.
Violation of assumptions: Transformations (e.g., log transformation) can often address violations of normality or homogeneity of variances. If severe violations persist, consider non-parametric alternatives.
Interpreting interactions: In two-way ANOVA, understanding interaction effects can be challenging. Visualizations and careful examination of the means are crucial for interpreting these interactions.

Book Outline: Mastering JMP Analysis of Variance

Introduction: What is ANOVA? Why use JMP?
Chapter 1: Foundations of ANOVA: Types of ANOVA, assumptions, and underlying principles.
Chapter 2: Preparing Data in JMP: Data organization, variable types, and data cleaning techniques.
Chapter 3: One-Way ANOVA in JMP: Step-by-step guide, interpreting output, and post-hoc tests.
Chapter 4: Two-Way and Repeated Measures ANOVA in JMP: Advanced techniques, interaction effects, and model building.
Chapter 5: Interpreting Results and Reporting: Effect sizes, assumption

checks, and visualization.
Chapter 6: Troubleshooting and Advanced Topics: Addressing common issues, transformations, and alternative methods.
Conclusion: Summary, next steps, and resources for further learning.

(Each chapter would then be expanded upon with detailed explanations, examples, and JMP screenshots.)

FAQs:

1. What is the difference between ANOVA and t-test? A t-test compares the means of two groups, while ANOVA compares the means of two or more groups.

1. What are the assumptions of ANOVA? Normality, homogeneity of variances, and independence of observations.

1. What does a significant p-value indicate in ANOVA? It indicates that there is a statistically significant difference between at least two of the group means.

1. How do I perform post-hoc tests in JMP? They are available in the ANOVA output after a significant F-test.

1. What are some common reasons for violations of ANOVA assumptions? Skewed data, unequal variances, or dependent observations.

1. How do I interpret interaction effects in a two-way ANOVA? By examining the means and visualizing the interaction using interaction plots.

1. What are some alternatives to ANOVA if assumptions are violated? Non-parametric tests such as the Kruskal-Wallis test.

1. Can I use ANOVA with unequal sample sizes? Yes, but it can affect the power of the test.

1. Where can I find more resources on JMP ANOVA? JMP's online help documentation, statistical textbooks, and online tutorials.

Related Articles:

1. JMP Basics for Beginners: A guide to navigating the JMP software interface.
2. Understanding P-values and Statistical Significance: A detailed explanation of interpreting p-values.
3. Types of ANOVA: A Comparison: A detailed breakdown of one-way, two-way, and repeated measures ANOVA.
4. Post-Hoc Tests in Statistical Analysis: A comprehensive look at various post-hoc tests and their applications.
5. Interpreting ANOVA Tables: A step-by-step guide to understanding the information presented in an ANOVA table.
6. Data Visualization with JMP: Exploring the various visualization tools within JMP.
7. Statistical Assumptions and Their Importance: A discussion of the importance of checking statistical assumptions.
8. Transformations in Statistical Analysis: A guide to different data transformations and when to use them.
9. Non-Parametric Alternatives to ANOVA: Exploring non-parametric statistical tests that can replace ANOVA when necessary.

jmp analysis of variance: Analysis of Repeated Measures Martin J. Crowder, David J. Hand, 2017-10-24 Repeated measures data arise when the same characteristic is measured on each case or subject at several times or under several conditions. There is a multitude of techniques available for analysing such data and in the past this has led to some confusion. This book describes the whole spectrum of approaches, beginning with very simple and crude methods, working through intermediate techniques commonly used by consultant statisticians, and concluding with more recent and advanced methods. Those covered include multiple testing, response feature analysis, univariate analysis of variance approaches, multivariate analysis of variance approaches, regression models, two-stage line models, approaches to categorical data and techniques for analysing crossover designs. The theory is illustrated with examples, using real data brought to the authors during their work as statistical consultants.

jmp analysis of variance: JMP Start Statistics John Sall, Mia L. Stephens, Ann Lehman, Sheila Loring, 2017-02-21 This book provides hands-on tutorials with just the right amount of conceptual and motivational material to illustrate how to use the intuitive interface for data analysis in JMP. Each chapter features concept-specific tutorials, examples, brief reviews of concepts, step-by-step illustrations, and exercises. Updated for JMP 13, JMP Start Statistics, Sixth Edition includes many new features, including: The redesigned Formula Editor. New and improved ways to

create formulas in JMP directly from the data table or dialogs. Interface updates, including improved menu layout. Updates and enhancements in many analysis platforms. New ways to get data into JMP and to save and share JMP results. Many new features that make it easier to use JMP.

jmp analysis of variance: JMP for Basic Univariate and Multivariate Statistics Ann Lehman, Norm O'Rourke, Larry Hatcher, Edward Stepanski, 2013 Learn how to manage JMP data and perform the statistical analyses most commonly used in research in the social sciences and other fields with JMP for Basic Univariate and Multivariate Statistics: Methods for Researchers and Social Scientists, Second Edition. Updated for JMP 10 and including new features on the statistical platforms, this book offers clearly written instructions to guide you through the basic concepts of research and data analysis, enabling you to easily perform statistical analyses and solve problems in real-world research. Step by step, you'll discover how to obtain descriptive and inferential statistics, summarize results clearly in a way that is suitable for publication, perform a wide range of JMP analyses, interpret the results, and more. Topics include screening data for errors selecting subsets computing the coefficient alpha reliability index (Cronbach's alpha) for a multiple-item scale performing bivariate analyses for all types of variables performing a one-way analysis of variance (ANOVA), multiple regression, and a one-way multivariate analysis of variance (MANOVA) Advanced topics include analyzing models with interactions and repeated measures. There is also comprehensive coverage of principle components with emphasis on graphical interpretation. This user-friendly book introduces researchers and students of the social sciences to JMP and to elementary statistical procedures, while the more advanced statistical procedures that are presented make it an invaluable reference guide for experienced researchers as well.

jmp analysis of variance: Practical Data Analysis with JMP Robert Carver, SAS Institute, 2010 Practical Data Analysis with JMP uses the powerful interactive and visual approach of JMP to introduce readers to the logic and methods of statistical thinking and data analysis. The book can stand on its own or be used to supplement a standard introduction-to-statistics textbook.

jmp analysis of variance: Biostatistics Using JMP Trevor Bihl, 2017-10-03 Analyze your biostatistics data with JMP! Trevor Bihl's Biostatistics Using JMP: A Practical Guide provides a practical introduction on using JMP, the interactive statistical discovery software, to solve biostatistical problems. Providing extensive breadth, from summary statistics to neural networks, this essential volume offers a comprehensive, step-by-step guide to using JMP to handle your data. The first biostatistical book to focus on software, Biostatistics Using JMP discusses such topics as data visualization, data wrangling, data cleaning, histograms, box plots, Pareto plots, scatter plots, hypothesis tests, confidence intervals, analysis of variance, regression, curve fitting, clustering, classification, discriminant analysis, neural networks, decision trees, logistic regression, survival analysis, control charts, and metaanalysis. Written for university students, professors, those who perform biological/biomedical experiments, laboratory managers, and research scientists, Biostatistics Using JMP provides a practical approach to using JMP to solve your biostatistical problems.

jmp analysis of variance: Practical Data Analysis with JMP, Third Edition Robert Carver, 2019-10-18 Master the concepts and techniques of statistical analysis using JMP Practical Data Analysis with JMP, Third Edition, highlights the powerful interactive and visual approach of JMP to introduce readers to statistical thinking and data analysis. It helps you choose the best technique for the problem at hand by using real-world cases. It also illustrates best-practice workflow throughout the entire investigative cycle, from asking valuable questions through data acquisition, preparation, analysis, interpretation, and communication of findings. The book can stand on its own as a learning resource for professionals, or it can be used to supplement a college-level textbook for an introductory statistics course. It includes varied examples and problems using real sets of data. Each chapter typically starts with an important or interesting research question that an investigator has pursued. Reflecting the broad applicability of statistical reasoning, the problems come from a wide variety of disciplines, including engineering, life sciences, business, and economics, as well as international and historical examples. Application Scenarios at the end of each chapter challenge

you to use your knowledge and skills with data sets that go beyond mere repetition of chapter examples. New in the third edition, chapters have been updated to demonstrate the enhanced capabilities of JMP, including projects, Graph Builder, Query Builder, and Formula Depot.

jmp analysis of variance: Fundamentals of Predictive Analytics with JMP, Second Edition Ron Klimberg, B. D. McCullough, 2017-12-19 Going beyond the theoretical foundation, this step-by-step book gives you the technical knowledge and problem-solving skills that you need to perform real-world multivariate data analysis. --

jmp analysis of variance: *Statistical Analysis for Business Using JMP* Willbann D. Terpening, 2011 Statistical Analysis for Business Using JMP: A Student's Guide by Willbann D. Terpening is a complete and thorough introduction to business statistics using JMP. While designed for introductory business statistics courses at the undergraduate or MBA level, industry professionals wanting to brush up on their knowledge of statistics and those wanting an introduction to using JMP for statistical analysis will also find the book useful. The book starts with an introduction to using JMP in statistical analysis, basic descriptive statistics and graphical analysis, and the fundamentals of inferential statistics. The book then covers more advanced topics in inferential statistics organized around the analysis platforms of JMP. Topics include the effects of a qualitative variable on a quantitative variable (two group tests and analysis of variance), the effects of a qualitative variable on a qualitative variable (chi-square and contingency tables), the effects of a quantitative variable on a quantitative variable (simple regression and correlation), and the effects of a quantitative variable on a qualitative variable (logistic and multinomial regression). The final chapter provides an introduction to multivariate statistics and multiple regression.

jmp analysis of variance: Statistics and Probability with Applications for Engineers and Scientists Bhisham C. Gupta, Irwin Guttman, 2013-04-29 Introducing the tools of statistics and probability from the ground up An understanding of statistical tools is essential for engineers and scientists who often need to deal with data analysis over the course of their work. Statistics and Probability with Applications for Engineers and Scientists walks readers through a wide range of popular statistical techniques, explaining step-by-step how to generate, analyze, and interpret data for diverse applications in engineering and the natural sciences. Unique among books of this kind, Statistics and Probability with Applications for Engineers and Scientists covers descriptive statistics first, then goes on to discuss the fundamentals of probability theory. Along with case studies, examples, and real-world data sets, the book incorporates clear instructions on how to use the statistical packages Minitab® and Microsoft® Office Excel® to analyze various data sets. The book also features: • Detailed discussions on sampling distributions, statistical estimation of population parameters, hypothesis testing, reliability theory, statistical quality control including Phase I and Phase II control charts, and process capability indices • A clear presentation of nonparametric methods and simple and multiple linear regression methods, as well as a brief discussion on logistic regression method • Comprehensive guidance on the design of experiments, including randomized block designs, one- and two-way layout designs, Latin square designs, random effects and mixed effects models, factorial and fractional factorial designs, and response surface methodology • A companion website containing data sets for Minitab and Microsoft Office Excel, as well as JMP ® routines and results Assuming no background in probability and statistics, Statistics and Probability with Applications for Engineers and Scientists features a unique, yet tried-and-true, approach that is ideal for all undergraduate students as well as statistical practitioners who analyze and illustrate real-world data in engineering and the natural sciences.

jmp analysis of variance: Design and Analysis of Experiments by Douglas Montgomery Heath Rushing, Andrew Karl, James Wisnowski, 2014-11-12 With a growing number of scientists and engineers using JMP software for design of experiments, there is a need for an example-driven book that supports the most widely used textbook on the subject, Design and Analysis of Experiments by Douglas C. Montgomery. Design and Analysis of Experiments by Douglas Montgomery: A Supplement for Using JMP meets this need and demonstrates all of the examples from the Montgomery text using JMP. In addition to scientists and engineers, undergraduate and graduate

students will benefit greatly from this book. While users need to learn the theory, they also need to learn how to implement this theory efficiently on their academic projects and industry problems. In this first book of its kind using JMP software, Rushing, Karl and Wisnowski demonstrate how to design and analyze experiments for improving the quality, efficiency, and performance of working systems using JMP. Topics include JMP software, two-sample t-test, ANOVA, regression, design of experiments, blocking, factorial designs, fractional-factorial designs, central composite designs, Box-Behnken designs, split-plot designs, optimal designs, mixture designs, and 2 k factorial designs. JMP platforms used include Custom Design, Screening Design, Response Surface Design, Mixture Design, Distribution, Fit Y by X, Matched Pairs, Fit Model, and Profiler. With JMP software, Montgomery's textbook, and Design and Analysis of Experiments by Douglas Montgomery: A Supplement for Using JMP, users will be able to fit the design to the problem, instead of fitting the problem to the design. This book is part of the SAS Press program.

jmp analysis of variance: Statistics with JMP: Hypothesis Tests, ANOVA and Regression Peter Goos, David Meintrup, 2016-04-18 Statistics with JMP: Hypothesis Tests, ANOVA and Regression Peter Goos, University of Leuven and University of Antwerp, Belgium David Meintrup, University of Applied Sciences Ingolstadt, Germany A first course on basic statistical methodology using JMP This book provides a first course on parameter estimation (point estimates and confidence interval estimates), hypothesis testing, ANOVA and simple linear regression. The authors approach combines mathematical depth with numerous examples and demonstrations using the JMP software. Key features: Provides a comprehensive and rigorous presentation of introductory statistics that has been extensively classroom tested. Pays attention to the usual parametric hypothesis tests as well as to non-parametric tests (including the calculation of exact p-values). Discusses the power of various statistical tests, along with examples in JMP to enable in-sight into this difficult topic. Promotes the use of graphs and confidence intervals in addition to p-values. Course materials and tutorials for teaching are available on the book's companion website. Masters and advanced students in applied statistics, industrial engineering, business engineering, civil engineering and bio-science engineering will find this book beneficial. It also provides a useful resource for teachers of statistics particularly in the area of engineering.

jmp analysis of variance: JMP for Mixed Models Ruth Hummel, Elizabeth A. Claassen, Russell D. Wolfinger, 2021-06-09 Discover the power of mixed models with JMP and JMP Pro. Mixed models are now the mainstream method of choice for analyzing experimental data. Why? They are arguably the most straightforward and powerful way to handle correlated observations in designed experiments. Reaching well beyond standard linear models, mixed models enable you to make accurate and precise inferences about your experiments and to gain deeper understanding of sources of signal and noise in the system under study. Well-formed fixed and random effects generalize well and help you make the best data-driven decisions. JMP for Mixed Models brings together two of the strongest traditions in SAS software: mixed models and JMP. JMP's groundbreaking philosophy of tight integration of statistics with dynamic graphics is an ideal milieu within which to learn and apply mixed models, also known as hierarchical linear or multilevel models. If you are a scientist or engineer, the methods described herein can revolutionize how you analyze experimental data without the need to write code. Inside you'll find a rich collection of examples and a step-by-step approach to mixed model mastery. Topics include: Learning how to appropriately recognize, set up, and interpret fixed and random effects Extending analysis of variance (ANOVA) and linear regression to numerous mixed model designs Understanding how degrees of freedom work using Skeleton ANOVA Analyzing randomized block, split-plot, longitudinal, and repeated measures designs Introducing more advanced methods such as spatial covariance and generalized linear mixed models Simulating mixed models to assess power and other important sampling characteristics Providing a solid framework for understanding statistical modeling in general Improving perspective on modern dilemmas around Bayesian methods, p-values, and causal inference

jmp analysis of variance: Introduction to Biostatistics with JMP Steve Figard, 2019-10-04

Explore biostatistics using JMP® in this refreshing introduction Presented in an easy-to-understand way, Introduction to Biostatistics with JMP® introduces undergraduate students in the biological sciences to the most commonly used (and misused) statistical methods that they will need to analyze their experimental data using JMP. It covers many of the basic topics in statistics using biological examples for exercises so that the student biologists can see the relevance to future work in the problems addressed. The book starts by teaching students how to become confident in executing the right analysis by thinking like a statistician then moves into the application of specific tests. Using the powerful capabilities of JMP, the book addresses problems requiring analysis by chi-square tests, t tests, ANOVA analysis, various regression models, DOE, and survival analysis. Topics of particular interest to the biological or health science field include odds ratios, relative risk, and survival analysis. The author uses an engaging, conversational tone to explain concepts and keep readers interested in learning more. The book aims to create bioscientists who can competently incorporate statistics into their investigative toolkits to solve biological research questions as they arise.

jmp analysis of variance: Statistical Design George Casella, 2008-04-03 Statistical design is one of the fundamentals of our subject, being at the core of the growth of statistics during the previous century. In this book the basic theoretical underpinnings are covered. It describes the principles that drive good designs and good statistics. Design played a key role in agricultural statistics and set down principles of good practice, principles that still apply today. Statistical design is all about understanding where the variance comes from, and making sure that is where the replication is. Indeed, it is probably correct to say that these principles are even more important today.

jmp analysis of variance: Discovering Partial Least Squares with JMP Ian Cox, Marie Gaudard, 2013-10 Using JMP statistical discovery software from SAS, Discovering Partial Least Squares with JMP explores Partial Least Squares and positions it within the more general context of multivariate analysis. This book motivates current and potential users of JMP to extend their analytical repertoire by embracing PLS. Dynamically interacting with JMP, you will develop confidence as you explore underlying concepts and work through the examples. The authors provide background and guidance to support and empower you on this journey.

jmp analysis of variance: Statistics with JMP Peter Goos, David Meintrup, 2015-05-04 Peter Goos, Department of Statistics, University of Leuven, Faculty of Bio-Science Engineering and University of Antwerp, Faculty of Applied Economics, Belgium David Meintrup, Department of Mathematics and Statistics, University of Applied Sciences Ingolstadt, Faculty of Mechanical Engineering, Germany Thorough presentation of introductory statistics and probability theory, with numerous examples and applications using JMP JMP: Graphs, Descriptive Statistics and Probability provides an accessible and thorough overview of the most important descriptive statistics for nominal, ordinal and quantitative data with particular attention to graphical representations. The authors distinguish their approach from many modern textbooks on descriptive statistics and probability theory by offering a combination of theoretical and mathematical depth, and clear and detailed explanations of concepts. Throughout the book, the user-friendly, interactive statistical software package JMP is used for calculations, the computation of probabilities and the creation of figures. The examples are explained in detail, and accompanied by step-by-step instructions and screenshots. The reader will therefore develop an understanding of both the statistical theory and its applications. Traditional graphs such as needle charts, histograms and pie charts are included, as well as the more modern mosaic plots, bubble plots and heat maps. The authors discuss probability theory, particularly discrete probability distributions and continuous probability densities, including the binomial and Poisson distributions, and the exponential, normal and lognormal densities. They use numerous examples throughout to illustrate these distributions and densities. Key features: Introduces each concept with practical examples and demonstrations in JMP. Provides the statistical theory including detailed mathematical derivations. Presents illustrative examples in each chapter accompanied by step-by-step instructions and screenshots to help develop the reader’s understanding of both the statistical theory and its applications. A supporting website with data sets

and other teaching materials. This book is equally aimed at students in engineering, economics and natural sciences who take classes in statistics as well as at masters/advanced students in applied statistics and probability theory. For teachers of applied statistics, this book provides a rich resource of course material, examples and applications.

jmp analysis of variance: Elementary Statistics Using JMP Sandra D. Schlotzhauer, 2007 Learn how to perform basic statistical analyses using the powerful JMP software. Elementary Statistics Using JMP bridges the gap between statistics texts and JMP documentation. Author Sandra Schlotzhauer opens with an explanation of the basics of JMP data tables, demonstrating how to use JMP for descriptive statistics and graphs. The author continues with a lucid discussion of fundamental statistical concepts, including normality and hypothesis testing. Using a step-by-step approach, she shows analyses for comparing two groups, comparing multiple groups, fitting regression equations, and exploring contingency tables. For each analysis, the author clearly explains assumptions, the statistical approach, the JMP steps and results, and how to make conclusions from the results. Statistical methods include: *histograms, box plots, descriptive statistics, stem-and-leaf plots *mosaic plots, bar charts, and treemaps *t-tests and Wilcoxon tests to compare two independent or paired groups *one-way ANOVA and Kruskal-Wallis tests, and selected multiple comparison techniques *Pearson and Spearman correlation coefficients *regression models for lines, curves, and multiple variables *residuals plots and lack-of-fit tests for regression *Chi-square tests, Fisher's Exact test, and measures of association for contingency tables. Understand how to interpret both the graphs and text reports, as well as how to customize JMP results to meet your needs. Packed with examples from a broad range of industries, this text is ideal for novice to intermediate JMP users. Prior statistical knowledge, JMP experience, or programming skills are not required.

jmp analysis of variance: *Building Better Models with JMP Pro* Jim Grayson, Sam Gardner, Mia Stephens, 2015-08-01 Building Better Models with JMP® Pro provides an example-based introduction to business analytics, with a proven process that guides you in the application of modeling tools and concepts. It gives you the what, why, and how of using JMP® Pro for building and applying analytic models. This book is designed for business analysts, managers, and practitioners who may not have a solid statistical background, but need to be able to readily apply analytic methods to solve business problems. In addition, this book will greatly benefit faculty members who teach any of the following subjects at the lower to upper graduate level: predictive modeling, data mining, and business analytics. Novice to advanced users in business statistics, business analytics, and predictive modeling will find that it provides a peek inside the black box of algorithms and the methods used. Topics include: regression, logistic regression, classification and regression trees, neural networks, model cross-validation, model comparison and selection, and data reduction techniques. Full of rich examples, Building Better Models with JMP Pro is an applied book on business analytics and modeling that introduces a simple methodology for managing and executing analytics projects. No prior experience with JMP is needed. Make more informed decisions from your data using this newest JMP book.

jmp analysis of variance: Statistical Quality Control Bhisham C. Gupta, 2021-07-23 STATISTICAL QUALITY CONTROL Provides a basic understanding of statistical quality control (SQC) and demonstrates how to apply the techniques of SQC to improve the quality of products in various sectors This book introduces Statistical Quality Control and the elements of Six Sigma Methodology, illustrating the widespread applications that both have for a multitude of areas, including manufacturing, finance, transportation, and more. It places emphasis on both the theory and application of various SQC techniques and offers a large number of examples using data encountered in real life situations to support each theoretical concept. Statistical Quality Control: Using MINITAB, R, JMP and Python begins with a brief discussion of the different types of data encountered in various fields of statistical applications and introduces graphical and numerical tools needed to conduct preliminary analysis of the data. It then discusses the basic concept of statistical quality control (SQC) and Six Sigma Methodology and examines the different types of sampling

methods encountered when sampling schemes are used to study certain populations. The book also covers Phase 1 Control Charts for variables and attributes; Phase II Control Charts to detect small shifts; the various types of Process Capability Indices (CPI); certain aspects of Measurement System Analysis (MSA); various aspects of PRE-control; and more. This helpful guide also Focuses on the learning and understanding of statistical quality control for second and third year undergraduates and practitioners in the field Discusses aspects of Six Sigma Methodology Teaches readers to use MINITAB, R, JMP and Python to create and analyze charts Requires no previous knowledge of statistical theory Is supplemented by an instructor-only book companion site featuring data sets and a solutions manual to all problems, as well as a student book companion site that includes data sets and a solutions manual to all odd-numbered problems Statistical Quality Control: Using MINITAB, R, JMP and Python is an excellent book for students studying engineering, statistics, management studies, and other related fields and who are interested in learning various techniques of statistical quality control. It also serves as a desk reference for practitioners who work to improve quality in various sectors, such as manufacturing, service, transportation, medical, oil, and financial institutions. It's also useful for those who use Six Sigma techniques to improve the quality of products in such areas.

jmp analysis of variance: Applied Regression Modeling Iain Pardoe, 2013-01-07 Praise for the First Edition The attention to detail is impressive. The book is very well written and the author is extremely careful with his descriptions . . . the examples are wonderful. —The American Statistician Fully revised to reflect the latest methodologies and emerging applications, Applied Regression Modeling, Second Edition continues to highlight the benefits of statistical methods, specifically regression analysis and modeling, for understanding, analyzing, and interpreting multivariate data in business, science, and social science applications. The author utilizes a bounty of real-life examples, case studies, illustrations, and graphics to introduce readers to the world of regression analysis using various software packages, including R, SPSS, Minitab, SAS, JMP, and S-PLUS. In a clear and careful writing style, the book introduces modeling extensions that illustrate more advanced regression techniques, including logistic regression, Poisson regression, discrete choice models, multilevel models, and Bayesian modeling. In addition, the Second Edition features clarification and expansion of challenging topics, such as: Transformations, indicator variables, and interaction Testing model assumptions Nonconstant variance Autocorrelation Variable selection methods Model building and graphical interpretation Throughout the book, datasets and examples have been updated and additional problems are included at the end of each chapter, allowing readers to test their comprehension of the presented material. In addition, a related website features the book's datasets, presentation slides, detailed statistical software instructions, and learning resources including additional problems and instructional videos. With an intuitive approach that is not heavy on mathematical detail, Applied Regression Modeling, Second Edition is an excellent book for courses on statistical regression analysis at the upper-undergraduate and graduate level. The book also serves as a valuable resource for professionals and researchers who utilize statistical methods for decision-making in their everyday work.

jmp analysis of variance: JMP Start Statistics John Sall, Ann Lehman, Lee Creighton, 2001 JMP IN® is an interactive software tool especially designed for statistical visualization and exploratory data analysis. JMP's goal is to analyze data in as graphical a way as possible, enabling you to discover more, interact more, and understand more.

jmp analysis of variance: Statistical Data Analysis Using SAS Mervyn G. Marasinghe, Kenneth J. Koehler, 2018-04-12 The aim of this textbook (previously titled SAS for Data Analytics) is to teach the use of SAS for statistical analysis of data for advanced undergraduate and graduate students in statistics, data science, and disciplines involving analyzing data. The book begins with an introduction beyond the basics of SAS, illustrated with non-trivial, real-world, worked examples. It proceeds to SAS programming and applications, SAS graphics, statistical analysis of regression models, analysis of variance models, analysis of variance with random and mixed effects models, and then takes the discussion beyond regression and analysis of variance to conclude. Pedagogically, the

authors introduce theory and methodological basis topic by topic, present a problem as an application, followed by a SAS analysis of the data provided and a discussion of results. The text focuses on applied statistical problems and methods. Key features include: end of chapter exercises, downloadable SAS code and data sets, and advanced material suitable for a second course in applied statistics with every method explained using SAS analysis to illustrate a real-world problem. New to this edition: • Covers SAS v9.2 and incorporates new commands • Uses SAS ODS (output delivery system) for reproduction of tables and graphics output • Presents new commands needed to produce ODS output • All chapters rewritten for clarity • New and updated examples throughout • All SAS outputs are new and updated, including graphics • More exercises and problems • Completely new chapter on analysis of nonlinear and generalized linear models • Completely new appendix Mervyn G. Marasinghe, PhD, is Associate Professor Emeritus of Statistics at Iowa State University, where he has taught courses in statistical methods and statistical computing. Kenneth J. Koehler, PhD, is University Professor of Statistics at Iowa State University, where he teaches courses in statistical methodology at both graduate and undergraduate levels and primarily uses SAS to supplement his teaching.

jmp analysis of variance: Using JMP Student Edition SAS Publishing, 2009-04 Using JMP Student Edition is the official user guide for JMP Student Edition, the streamlined edition of JMP for first year statistics students. Clearly written, with easy-to-follow, step-by-step instructions, this book provides engaging illustrations and concept overviews. Chapters cover not only such JMP basics as importing data, univariate and bivariate data analysis, but also more complex analyses including Multiple Regression, Time Series, Design of Experiments, and Quality Control. JMP Student Edition software is available from major textbook publishers when packaged with their textbooks for course use.

jmp analysis of variance: Statistics with JMP: Hypothesis Tests, ANOVA and Regression Peter Goos, David Meintrup, 2016-02-16 Statistics with JMP: Hypothesis Tests, ANOVA and Regression Peter Goos, University of Leuven and University of Antwerp, Belgium David Meintrup, University of Applied Sciences Ingolstadt, Germany A first course on basic statistical methodology using JMP This book provides a first course on parameter estimation (point estimates and confidence interval estimates), hypothesis testing, ANOVA and simple linear regression. The authors approach combines mathematical depth with numerous examples and demonstrations using the JMP software. Key features: Provides a comprehensive and rigorous presentation of introductory statistics that has been extensively classroom tested. Pays attention to the usual parametric hypothesis tests as well as to non-parametric tests (including the calculation of exact p-values). Discusses the power of various statistical tests, along with examples in JMP to enable in-sight into this difficult topic. Promotes the use of graphs and confidence intervals in addition to p-values. Course materials and tutorials for teaching are available on the book's companion website. Masters and advanced students in applied statistics, industrial engineering, business engineering, civil engineering and bio-science engineering will find this book beneficial. It also provides a useful resource for teachers of statistics particularly in the area of engineering.

jmp analysis of variance: Optimal Design of Experiments Peter Goos, Bradley Jones, 2011-06-28 This is an engaging and informative book on the modern practice of experimental design. The authors' writing style is entertaining, the consulting dialogs are extremely enjoyable, and the technical material is presented brilliantly but not overwhelmingly. The book is a joy to read. Everyone who practices or teaches DOE should read this book. - Douglas C. Montgomery, Regents Professor, Department of Industrial Engineering, Arizona State University It's been said: 'Design for the experiment, don't experiment for the design.' This book ably demonstrates this notion by showing how tailor-made, optimal designs can be effectively employed to meet a client's actual needs. It should be required reading for anyone interested in using the design of experiments in industrial settings. —Christopher J. Nachtsheim, Frank A Donaldson Chair in Operations Management, Carlson School of Management, University of Minnesota This book demonstrates the utility of the computer-aided optimal design approach using real industrial examples. These

examples address questions such as the following: How can I do screening inexpensively if I have dozens of factors to investigate? What can I do if I have day-to-day variability and I can only perform 3 runs a day? How can I do RSM cost effectively if I have categorical factors? How can I design and analyze experiments when there is a factor that can only be changed a few times over the study? How can I include both ingredients in a mixture and processing factors in the same study? How can I design an experiment if there are many factor combinations that are impossible to run? How can I make sure that a time trend due to warming up of equipment does not affect the conclusions from a study? How can I take into account batch information in when designing experiments involving multiple batches? How can I add runs to a botched experiment to resolve ambiguities? While answering these questions the book also shows how to evaluate and compare designs. This allows researchers to make sensible trade-offs between the cost of experimentation and the amount of information they obtain.

jmp analysis of variance: Business Statistics for Competitive Advantage with Excel and JMP Cynthia Fraser,

jmp analysis of variance: Pharmaceutical Quality by Design Using JMP: Solving Product Development and Manufacturing Problems Rob Lievense, 2018-09 Solve your pharmaceutical product development and manufacturing problems using JMP. Pharmaceutical Quality by Design Using JMP: Solving Product Development and Manufacturing Problems provides broad-based techniques available in JMP to visualize data and run statistical analyses for areas common in healthcare product manufacturing. As international regulatory agencies push the concept of Quality by Design (QbD), there is a growing emphasis to optimize the processing of products. This book uses practical examples from the pharmaceutical and medical device industries to illustrate easy-to-understand ways of incorporating QbD elements using JMP. Pharmaceutical Quality by Design Using JMP opens by demonstrating the easy navigation of JMP to visualize data through the distribution function and the graph builder and then highlights the following: the powerful dynamic nature of data visualization that enables users to be able to quickly extract meaningful information tools and techniques designed for the use of structured, multivariate sets of experiments examples of complex analysis unique to healthcare products such as particle size distributions/drug dissolution, stability of drug products over time, and blend uniformity/content uniformity. Scientists, engineers, and technicians involved throughout the pharmaceutical and medical device product life cycles will find this book invaluable.

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jmp analysis of variance: Validating Clinical Trial Data Reporting with SAS Carol I. Matthews, Brian C. Shilling, 2008 This indispensable guide focuses on validating programs written to support the clinical trial process from after the data collection stage to generating reports and submitting data and output to the Food and Drug Administration.

jmp analysis of variance: *Introduction to Statistics and Data Analysis* Roxy Peck, Chris Olsen, Jay L. Devore, 2019

jmp analysis of variance: JMP 9 Basic Analysis and Graphing SAS Publishing, 2010 JMP 9 Basic Analysis and Graphing documents the basic JMP 9 statistical platforms, provides an overview of basic statistical methods, and describes some JMP 9 report windows and options. This book covers univariate analysis, capability analyses, bivariate scatterplot, one-way ANOVA, contingency tables analysis, simple logistic regression, and paired data. Also included are instructions for using charts, overlay plots, interactive data visualization, contour plots, bubble plots, three-dimensional scatterplots, scatterplot matrices, ternary plots, tree maps, and more.

jmp analysis of variance: Analyzing and Interpreting Continuous Data Using JMP José G.. Ramírez, Brenda S.. Ramírez, Sas Institute, 2009 Based on real-world applications, this resource combines statistical instructions with a powerful and popular software platform to solve common problems in engineering and science. This step-by-step format enables users new to statistics or JMP to learn as they go.

jmp analysis of variance: *Batch Effects and Noise in Microarray Experiments* Andreas Scherer, 2009-11-03 Batch Effects and Noise in Microarray Experiments: Sources and Solutions looks at the issue of technical noise and batch effects in microarray studies and illustrates how to alleviate such factors whilst interpreting the relevant biological information. Each chapter focuses on sources of noise and batch effects before starting an experiment, with examples of statistical methods for detecting, measuring, and managing batch effects within and across datasets provided online. Throughout the book the importance of standardization and the value of standard operating procedures in the development of genomics biomarkers is emphasized. Key Features: A thorough introduction to Batch Effects and Noise in Microrarray Experiments. A unique compilation of review and research articles on handling of batch effects and technical and biological noise in microarray data. An extensive overview of current standardization initiatives. All datasets and methods used in the chapters, as well as colour images, are available on www.the-batch-effect-book.org, so that the data can be reproduced. An exciting compilation of state-of-the-art review chapters and latest research results, which will benefit all those involved in the planning, execution, and analysis of gene expression studies.

jmp analysis of variance: JMP for Basic Univariate and Multivariate Statistics Ann Lehman, PhD, Norm O'Rourke, Ph.D., R.Psych., Larry Hatcher, Ph.D., Edward J. Stepanski, Ph.D., 2013-04-16 Updated for JMP 10, the book provides hands-on tutorials with just the right amount of conceptual and motivational material to illustrate how to use the intuitive interface for data analysis in JMP. Features concept-specific tutorials, examples, brief reviews of concepts, step-by-step illustrations, and exercises.

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jmp analysis of variance: *JMP* , 2000

jmp analysis of variance: Data Management and Analysis Using JMP Jane E Oppenlander, Patricia Schaffer, 2017-10-17 A holistic, step-by-step approach to analyzing health care data! Written for both beginner and intermediate JMP users working in or studying health care, Data Management and Analysis Using JMP: Health Care Case Studies bridges the gap between taking traditional statistics courses and successfully applying statistical analysis in the workplace. Authors Jane Oppenlander and Patricia Schaffer begin by illustrating techniques to prepare data for analysis, followed by presenting effective methods to summarize, visualize, and analyze data. The statistical analysis methods covered in the book are the foundational techniques commonly applied to meet regulatory, operational, budgeting, and research needs in the health care field. This example-driven book shows practitioners how to solve real-world problems by using an approach that includes problem definition, data management, selecting the appropriate analysis methods, step-by-step JMP instructions, and interpreting statistical results in context. Practical strategies for selecting appropriate statistical methods, remediating data anomalies, and interpreting statistical results in the domain context are emphasized. The cases presented in Data Management and Analysis Using JMP use multiple statistical methods. A progression of methods--from univariate to multivariate--is employed, illustrating a logical approach to problem-solving. Much of the data used in these cases is open source and drawn from a variety of health care settings. The book offers a welcome guide to working professionals as well as students studying statistics in health care-related fields.

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