

least squares formula linear algebra

least squares formula linear algebra is a fundamental concept that plays a critical role in data analysis, statistics, and various applications within linear algebra. This technique is primarily used to find the best-fitting line or curve to a set of data points by minimizing the sum of the squares of the differences between the observed values and the values predicted by the model. In this article, we will explore the least squares formula in detail, covering its derivation, applications, and significance in linear algebra. We will also examine related concepts such as linear regression, the normal equation, and practical examples to provide a comprehensive understanding of this essential method.

The following sections will guide you through the intricacies of the least squares formula linear algebra and its applications in real-world scenarios.

- Introduction to the Least Squares Formula
- Derivation of the Least Squares Formula
- Applications of Least Squares in Linear Algebra
- Understanding Linear Regression
- Normal Equation of the Least Squares
- Examples and Practical Applications
- Conclusion

Introduction to the Least Squares Formula

The least squares formula is a mathematical approach used to approximate the solution of overdetermined systems, where there are more equations than unknowns. This method is particularly useful in finding the best-fitting line or curve through a set of data points, which is essential in various fields such as economics, engineering, and the social sciences. The primary goal of the least squares method is to minimize the discrepancies between the observed data points and the values predicted by the model.

In linear algebra, this technique is rooted in the concept of projection. The least squares solution can be viewed as a projection of the observed data onto a subspace defined by the model. This projection

minimizes the distance between the actual data points and the predicted values, thus achieving the best fit.

Derivation of the Least Squares Formula

To understand the least squares formula, we begin with a set of data points represented as $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$, where each x_i corresponds to an observed value and y_i is its associated target value. The goal is to fit a linear model of the form $y = mx + b$, where m is the slope and b is the y-intercept.

To derive the least squares formula, we follow these steps:

1. Define the Error: The error for each data point is defined as the difference between the observed value and the predicted value:

$$\text{Error } (e_i) = y_i - (mx_i + b)$$

2. Sum of Squares of Errors: The sum of the squared errors for all data points is computed:

$$S = \sum (y_i - (mx_i + b))^2$$

3. Minimize the Sum of Squares: To find the optimal values of m and b , we take the partial derivatives of S with respect to m and b and set them to zero:

$$\partial S / \partial m = 0 \text{ and } \partial S / \partial b = 0$$

4. Normal Equations: This leads to a system of equations known as the normal equations, which can be solved to find the optimal coefficients.

The least squares formula can be expressed in matrix form, which is particularly useful for computational applications.

Applications of Least Squares in Linear Algebra

The least squares method has numerous applications across different domains. Here are some key areas where it is utilized:

- **Data Fitting:** It is commonly used to fit models to empirical data, allowing for predictions and analysis of trends.
- **Machine Learning:** In machine learning, least squares is the foundation for linear regression algorithms, helping to train models on datasets.

- **Signal Processing:** Least squares techniques are used to filter noise from signals and reconstruct original data.
- **Econometrics:** Economists use least squares to analyze relationships between variables and forecast economic trends.

These applications demonstrate the versatility and importance of the least squares formula in solving real-world problems.

Understanding Linear Regression

Linear regression is a statistical method that models the relationship between a dependent variable and one or more independent variables. The least squares method is the most common technique for fitting a linear regression model.

In linear regression, the formula aims to find the best-fitting line that minimizes the sum of the squares of the residuals (the differences between observed and predicted values). The process involves several steps:

1. **Collect Data:** Gather data points for the dependent and independent variables.
2. **Fit the Model:** Use the least squares method to determine the coefficients of the linear model.
3. **Evaluate the Model:** Assess the model's performance using metrics like R-squared and root mean square error (RMSE).

Understanding linear regression through the lens of the least squares formula is essential for anyone involved in data analysis or predictive modeling.

Normal Equation of the Least Squares

The normal equation is a critical component of the least squares method, particularly in matrix form. For a linear model represented in matrix notation as $Y = X\beta$, where Y is the vector of observed values, X is the matrix of independent variables, and β is the vector of coefficients, the normal equation can be derived as follows:

1. **Formulate the Equation:** The goal is to minimize $\|Y - X\beta\|^2$.
2. **Differentiate:** Taking the derivative and setting it to zero yields:

$$X^T X \beta = X^T Y$$

3. **Solve for β :** The least squares solution is given by:

$$\beta = (X^T X)^{-1} X^T Y$$

This equation provides a direct method to compute the coefficients for the best-fitting line in the least squares context.

Examples and Practical Applications

To illustrate the least squares formula in action, consider a simple example. Suppose we have the following data points representing the sales of a product over a period:

- (1, 150)
- (2, 250)
- (3, 350)
- (4, 450)

To fit a linear model using the least squares method, we would follow these steps:

1. Set up the matrices:

$$X = \begin{bmatrix} 1 & 1 \\ 1 & 2 \\ 1 & 3 \\ 1 & 4 \end{bmatrix}, Y = \begin{bmatrix} 150 \\ 250 \\ 350 \\ 450 \end{bmatrix}$$

2. Compute β using the normal equation:

$$\beta = (X^T X)^{-1} X^T Y$$

3. Interpret the results: The resulting coefficients will give us the slope and y-intercept of the best-fitting line.

Through such examples, the practical utility of the least squares formula becomes clear, especially in scenarios involving predictions and trend analysis.

Conclusion

The least squares formula is an indispensable tool in linear algebra, providing a robust method for data fitting and analysis. Its applications span various fields, including statistics, machine learning, and economics, highlighting its versatility and significance. Understanding the derivation, normal equations, and practical applications of this method equips researchers and practitioners with the skills to analyze data effectively

and make informed decisions.

As we continue to gather and analyze data in an increasingly data-driven world, the importance of the least squares formula in linear algebra remains ever relevant.

Q: What is the least squares formula in linear algebra?

A: The least squares formula in linear algebra is a mathematical approach used to find the best-fitting line or curve to a set of data points by minimizing the sum of the squares of the differences between the observed values and the values predicted by the model.

Q: How is the least squares formula derived?

A: The least squares formula is derived by defining the error between observed values and predicted values, calculating the sum of squared errors, and then minimizing this sum by taking the partial derivatives with respect to the coefficients and setting them to zero.

Q: What are the applications of the least squares method?

A: The least squares method is applied in various domains, including data fitting, machine learning (for linear regression), signal processing, and econometrics for analyzing relationships between variables.

Q: What is the normal equation in the context of least squares?

A: The normal equation in the context of least squares is derived from minimizing the squared errors and is expressed as $X^T X \beta = X^T Y$, where X is the matrix of independent variables, Y is the vector of observed values, and β is the vector of coefficients.

Q: Can the least squares method be used for non-linear models?

A: Yes, while the least squares method is most commonly associated with linear models, it can also be adapted for non-linear models through techniques such as polynomial regression or by transforming the data.

Q: What are the limitations of the least squares method?

A: The limitations of the least squares method include sensitivity to outliers, the assumption of normally distributed errors, and the requirement of linear relationships between variables.

Q: How does least squares relate to linear regression?

A: Least squares is the foundational method used in linear regression to estimate the parameters of the regression line by minimizing the discrepancies between observed data points and the predicted values.

Q: What metrics can be used to evaluate a least squares regression model?

A: Common metrics to evaluate a least squares regression model include R-squared, adjusted R-squared, root mean square error (RMSE), and mean absolute error (MAE), which assess the model's performance and accuracy.

Q: Is the least squares formula applicable in multidimensional data?

A: Yes, the least squares formula can be applied to multidimensional data, allowing for multiple independent variables in the regression model, which is commonly known as multiple linear regression.

Q: How can the least squares method be implemented in programming?

A: The least squares method can be implemented in programming languages such as Python, R, and MATLAB using built-in libraries and functions that facilitate matrix operations and statistical modeling.

[Least Squares Formula Linear Algebra](#)

Find other PDF articles:

<https://explore.gcts.edu/business-suggest-016/Book?dataid=DSM65-7341&title=general-business-cr-edits-form-3800.pdf>

least squares formula linear algebra: *Introduction to Applied Linear Algebra* Stephen Boyd, Lieven Vandenberghe, 2018-06-07 This groundbreaking textbook combines straightforward explanations with a wealth of practical examples to offer an innovative approach to teaching linear algebra. Requiring no prior knowledge of the subject, it covers the aspects of linear algebra - vectors, matrices, and least squares - that are needed for engineering applications, discussing examples across data science, machine learning and artificial intelligence, signal and image processing, tomography, navigation, control, and finance. The numerous practical exercises throughout allow students to test their understanding and translate their knowledge into solving real-world problems, with lecture slides, additional computational exercises in Julia and MATLAB®, and data sets accompanying the book online. Suitable for both one-semester and one-quarter courses, as well as self-study, this self-contained text provides beginning students with the foundation they need to progress to more advanced study.

least squares formula linear algebra: Least Squares Regression Analysis in Terms of

Linear Algebra Enders Robinson, 1981

least squares formula linear algebra: Least Squares Regression Analysis in Terms of Linear Algebra Enders A. Robinson, 1981

least squares formula linear algebra: Solving Least Squares Problems Charles L. Lawson, Richard J. Hanson, 1995-12-01 This Classic edition includes a new appendix which summarizes the major developments since the book was originally published in 1974. The additions are organized in short sections associated with each chapter. An additional 230 references have been added, bringing the bibliography to over 400 entries. Appendix C has been edited to reflect changes in the associated software package and software distribution method.

least squares formula linear algebra: Practical Linear Algebra for Data Science Mike X Cohen, 2022-09-06 If you want to work in any computational or technical field, you need to understand linear algebra. As the study of matrices and operations acting upon them, linear algebra is the mathematical basis of nearly all algorithms and analyses implemented in computers. But the way it's presented in decades-old textbooks is much different from how professionals use linear algebra today to solve real-world modern applications. This practical guide from Mike X Cohen teaches the core concepts of linear algebra as implemented in Python, including how they're used in data science, machine learning, deep learning, computational simulations, and biomedical data processing applications. Armed with knowledge from this book, you'll be able to understand, implement, and adapt myriad modern analysis methods and algorithms. Ideal for practitioners and students using computer technology and algorithms, this book introduces you to: The interpretations and applications of vectors and matrices Matrix arithmetic (various multiplications and transformations) Independence, rank, and inverses Important decompositions used in applied linear algebra (including LU and QR) Eigendecomposition and singular value decomposition Applications including least-squares model fitting and principal components analysis

least squares formula linear algebra: KWIC Index for Numerical Algebra Alston Scott Householder, 1972

least squares formula linear algebra: Linear Algebra Eric Carlen, Maria Canceicao Carvalho, 2007-03-10 The Student Solutions Manual supports students in their independent study and review efforts, using it alongside the main text Linear Algebra by Carlen.

least squares formula linear algebra: Introduction to Linear Models and Statistical Inference Steven J. Janke, Frederick Tinsley, 2005-09-01 A multidisciplinary approach that emphasizes learning by analyzing real-world data sets This book is the result of the authors' hands-on classroom experience and is tailored to reflect how students best learn to analyze linear relationships. The text begins with the introduction of four simple examples of actual data sets. These examples are developed and analyzed throughout the text, and more complicated examples of data sets are introduced along the way. Taking a multidisciplinary approach, the book traces the conclusion of the analyses of data sets taken from geology, biology, economics, psychology, education, sociology, and environmental science. As students learn to analyze the data sets, they master increasingly sophisticated linear modeling techniques, including: * Simple linear models * Multivariate models * Model building * Analysis of variance (ANOVA) * Analysis of covariance (ANCOVA) * Logistic regression * Total least squares The basics of statistical analysis are developed and emphasized, particularly in testing the assumptions and drawing inferences from linear models. Exercises are included at the end of each chapter to test students' skills before moving on to more advanced techniques and models. These exercises are marked to indicate whether calculus, linear algebra, or computer skills are needed. Unlike other texts in the field, the mathematics underlying the models is carefully explained and accessible to students who may not have any background in calculus or linear algebra. Most chapters include an optional final section on linear algebra for students interested in developing a deeper understanding. The many data sets that appear in the text are available on the book's Web site. The MINITAB(r) software program is used to illustrate many of the examples. For students unfamiliar with MINITAB(r), an appendix introduces the key features needed to study linear models. With its multidisciplinary approach and use of real-world

data sets that bring the subject alive, this is an excellent introduction to linear models for students in any of the natural or social sciences.

least squares formula linear algebra: Handbook of Linear Algebra, Second Edition Leslie Hogben, 2013-11-26 With a substantial amount of new material, the Handbook of Linear Algebra, Second Edition provides comprehensive coverage of linear algebra concepts, applications, and computational software packages in an easy-to-use format. It guides you from the very elementary aspects of the subject to the frontiers of current research. Along with revisions and updates throughout, the second edition of this bestseller includes 20 new chapters. New to the Second Edition Separate chapters on Schur complements, additional types of canonical forms, tensors, matrix polynomials, matrix equations, special types of matrices, generalized inverses, matrices over finite fields, invariant subspaces, representations of quivers, and spectral sets New chapters on combinatorial matrix theory topics, such as tournaments, the minimum rank problem, and spectral graph theory, as well as numerical linear algebra topics, including algorithms for structured matrix computations, stability of structured matrix computations, and nonlinear eigenvalue problems More chapters on applications of linear algebra, including epidemiology and quantum error correction New chapter on using the free and open source software system Sage for linear algebra Additional sections in the chapters on sign pattern matrices and applications to geometry Conjectures and open problems in most chapters on advanced topics Highly praised as a valuable resource for anyone who uses linear algebra, the first edition covered virtually all aspects of linear algebra and its applications. This edition continues to encompass the fundamentals of linear algebra, combinatorial and numerical linear algebra, and applications of linear algebra to various disciplines while also covering up-to-date software packages for linear algebra computations.

least squares formula linear algebra: Linear Models: An Integrated Approach S Rao Jammalamadaka, Debasis Sengupta, 2003-03-03 Linear Models: An Integrated Approach aims to provide a clear and deep understanding of the general linear model using simple statistical ideas. Elegant geometric arguments are also invoked as needed and a review of vector spaces and matrices is provided to make the treatment self-contained. Complex, matrix-algebraic methods, such as those used in the rank-deficient case, are replaced by statistical proofs that are more transparent and that show the parallels with the simple linear model. This book has the following special features:

least squares formula linear algebra: Python Programming and Numerical Methods Qingkai Kong, Timmy Siau, Alexandre Bayen, 2020-11-27 Python Programming and Numerical Methods: A Guide for Engineers and Scientists introduces programming tools and numerical methods to engineering and science students, with the goal of helping the students to develop good computational problem-solving techniques through the use of numerical methods and the Python programming language. Part One introduces fundamental programming concepts, using simple examples to put new concepts quickly into practice. Part Two covers the fundamentals of algorithms and numerical analysis at a level that allows students to quickly apply results in practical settings. - Includes tips, warnings and try this features within each chapter to help the reader develop good programming practice - Summaries at the end of each chapter allow for quick access to important information - Includes code in Jupyter notebook format that can be directly run online

least squares formula linear algebra: Current Trends in Operator Theory and its Applications Joseph A. Ball, J. William Helton, Martin Klaus, Leiba Rodman, 2012-12-06 Many developments on the cutting edge of research in operator theory and its applications are reflected in this collection of original and review articles. Particular emphasis lies on highlighting the interplay between operator theory and applications from other areas, such as multi-dimensional systems and function theory of several complex variables, distributed parameter systems and control theory, mathematical physics, wavelets, and numerical analysis.

least squares formula linear algebra: Computational Methods for Numerical Analysis with R James P Howard, II, 2017-07-12 Computational Methods for Numerical Analysis with R is an overview of traditional numerical analysis topics presented using R. This guide shows how common functions from linear algebra, interpolation, numerical integration, optimization, and differential

equations can be implemented in pure R code. Every algorithm described is given with a complete function implementation in R, along with examples to demonstrate the function and its use. Computational Methods for Numerical Analysis with R is intended for those who already know R, but are interested in learning more about how the underlying algorithms work. As such, it is suitable for statisticians, economists, and engineers, and others with a computational and numerical background.

least squares formula linear algebra: Generalized Inverses Adi Ben-Israel, Thomas N.E. Greville, 2006-04-18 This second edition accounts for many major developments in generalized inverses while maintaining the informal and leisurely style of the 1974 first edition. Added material includes a chapter on applications, new exercises, and an appendix on the work of E.H. Moore.

least squares formula linear algebra: Numerical Methods for Least Squares Problems, Second Edition Åke Björck, 2024-07-05 The method of least squares, discovered by Gauss in 1795, is a principal tool for reducing the influence of errors when fitting a mathematical model to given observations. Applications arise in many areas of science and engineering. The increased use of automatic data capturing frequently leads to large-scale least squares problems. Such problems can be solved by using recent developments in preconditioned iterative methods and in sparse QR factorization. The first edition of Numerical Methods for Least Squares Problems was the leading reference on the topic for many years. The updated second edition stands out compared to other books on this subject because it provides an in-depth and up-to-date treatment of direct and iterative methods for solving different types of least squares problems and for computing the singular value decomposition. It also is unique because it covers generalized, constrained, and nonlinear least squares problems as well as partial least squares and regularization methods for discrete ill-posed problems. The bibliography of over 1,100 historical and recent references provides a comprehensive survey of past and present research in the field. This book will be of interest to graduate students and researchers in applied mathematics and to researchers working with numerical linear algebra applications.

least squares formula linear algebra: Fitting Linear Relationships R.W. Farebrother, 2012-12-06 This book is intended for students of mathematical statistics who are interested in the early history of their subject. It gives detailed algebraic descriptions of the fitting of linear relationships by the method of least squares (L) and the related least absolute 2 deviations (L) and minimax absolute deviations (Loo) procedures. These traditional line J fitting procedures are, of course, also addressed in conventional statistical textbooks, but the discussion of their historical background is usually extremely slight, if not entirely absent. The present book complements the analysis of these procedures given in S.M. Stigler's excellent work The History of Statistics: The Quantification of Uncertainty before 1900. However, the present book gives a more detailed account of the algebraic structure underlying these traditional fitting procedures. It is anticipated that readers of the present book will obtain a clear understanding of the historical background to these and other commonly used statistical procedures. Further, a careful consideration of the wide variety of distinct approaches to a particular topic, such as the method of least squares, will give the reader valuable insights into the essential nature of the selected topic.

least squares formula linear algebra: Matrix Analysis and Applied Linear Algebra Carl D. Meyer, 2000-01-01 Matrix Analysis and Applied Linear Algebra is an honest math text that circumvents the traditional definition-theorem-proof format that has bored students in the past. Meyer uses a fresh approach to introduce a variety of problems and examples ranging from the elementary to the challenging and from simple applications to discovery problems. The focus on applications is a big difference between this book and others. Meyer's book is more rigorous and goes into more depth than some. He includes some of the more contemporary topics of applied linear algebra which are not normally found in undergraduate textbooks. Modern concepts and notation are used to introduce the various aspects of linear equations, leading readers easily to numerical computations and applications. The theoretical developments are always accompanied with examples, which are worked out in detail. Each section ends with a large number of carefully

chosen exercises from which the students can gain further insight.

least squares formula linear algebra: Computer Algebra in Scientific Computing

Vladimir P. Gerdt, Wolfram Koepf, Werner M. Seiler, Evgenii V. Vorozhtsov, 2014-09-01 This book constitutes the proceedings of the 16th International Workshop on Computer Algebra in Scientific Computing, CASC 2014, held in Warsaw, Poland, in September 2014. The 33 full papers presented were carefully reviewed and selected for inclusion in this book. The papers address issues such as Studies in polynomial algebra are represented by contributions devoted to factoring sparse bivariate polynomials using the priority queue, the construction of irreducible polynomials by using the Newton index, real polynomial root finding by means of matrix and polynomial iterations, application of the eigenvalue method with symmetry for solving polynomial systems arising in the vibration analysis of mechanical structures with symmetry properties, application of Gröbner systems for computing the (absolute) reduction number of polynomial ideals, the application of cylindrical algebraic decomposition for solving the quantifier elimination problems, certification of approximate roots of overdetermined and singular polynomial systems via the recovery of an exact rational univariate representation from approximate numerical data, new parallel algorithms for operations on univariate polynomials (multi-point evaluation, interpolation) based on subproduct tree techniques.

least squares formula linear algebra: Linear Algebra Theodore Shifrin, Malcolm Adams,

2010-07-30 Linear Algebra: A Geometric Approach, Second Edition, presents the standard computational aspects of linear algebra and includes a variety of intriguing interesting applications that would be interesting to motivate science and engineering students, as well as help mathematics students make the transition to more abstract advanced courses. The text guides students on how to think about mathematical concepts and write rigorous mathematical arguments.

least squares formula linear algebra: Math Physics Foundation of Advanced Remote Sensing Digital Image Processing Lei Yan, Hongying Zhao, Yi Lin, Yanbiao Sun, 2023-07-31 This book focuses on the mathematical and physical foundations of remote sensing digital image processing and introduces key algorithms utilized in this area. The book fully introduces the basic mathematical and physical process of digital imaging, the basic theory and algorithm of pixel image processing, and the higher-order image processing algorithm and its application. This book skillfully and closely integrates theory, algorithms, and applications, making it simple for readers to understand and use. Researchers and students working in the fields of remote sensing, computer vision, geographic information science, electronic information, etc., can profit from this book. For their work and research in digital image processing, they can master the fundamentals of imaging and image processing techniques.

Related to least squares formula linear algebra

LEAST Definition & Meaning - Merriam-Webster The meaning of LEAST is lowest in importance or position. How to use least in a sentence

LEAST | English meaning - Cambridge Dictionary We use the quantifier least to talk about quantities, amounts and degree. (The) least is the superlative form of little.

LEAST Definition & Meaning | adverb to the smallest extent, amount, or degree. That's the least important question of all. He talks least

Least - definition of least by The Free Dictionary 1. smallest in size, amount, degree, etc.; slightest: to pay the least amount of attention. 2. lowest in consideration, position, or importance
least - Wiktionary, the free dictionary least (negative superlative) Used for forming superlatives of adjectives, especially those that do not form the superlative by adding -est

LEAST definition and meaning | Collins English Dictionary You use least to indicate that something is true or happens to a smaller degree or extent than anything else or at any other time. He had a way of throwing her off guard with his charm when

least | Dictionaries and vocabulary tools for English Definition of least. English dictionary and integrated thesaurus for learners, writers, teachers, and students with advanced, intermediate, and

beginner levels

LEAST Definition & Meaning - Merriam-Webster The meaning of LEAST is lowest in importance or position. How to use least in a sentence

LEAST | English meaning - Cambridge Dictionary We use the quantifier least to talk about quantities, amounts and degree. (The) least is the superlative form of little.

LEAST Definition & Meaning | adverb to the smallest extent, amount, or degree. That's the least important question of all. He talks least

Least - definition of least by The Free Dictionary 1. smallest in size, amount, degree, etc.; slightest: to pay the least amount of attention. 2. lowest in consideration, position, or importance

least - Wiktionary, the free dictionary least (negative superlative) Used for forming superlatives of adjectives, especially those that do not form the superlative by adding -est

LEAST definition and meaning | Collins English Dictionary You use least to indicate that something is true or happens to a smaller degree or extent than anything else or at any other time. He had a way of throwing her off guard with his charm when

least | Dictionaries and vocabulary tools for English Definition of least. English dictionary and integrated thesaurus for learners, writers, teachers, and students with advanced, intermediate, and beginner levels

Related to least squares formula linear algebra

Least Squares Criterion: What it is, How it Works (Investopedia3y) Will Kenton is an expert on the economy and investing laws and regulations. He previously held senior editorial roles at Investopedia and Kapitall Wire and holds a MA in Economics from The New School

Least Squares Criterion: What it is, How it Works (Investopedia3y) Will Kenton is an expert on the economy and investing laws and regulations. He previously held senior editorial roles at Investopedia and Kapitall Wire and holds a MA in Economics from The New School

Linear Regression with Non-Constant, Unknown Error Variances: Sampling Experiments with Least Squares, Weighted Least Squares and Maximum Likelihood Estimators (JSTOR Daily2y) John A. Jacquez, Frances J. Mather and Charles R. Crawford The theory of simple linear regression is extended to the case of non-uniform error variances for the

Linear Regression with Non-Constant, Unknown Error Variances: Sampling Experiments with Least Squares, Weighted Least Squares and Maximum Likelihood Estimators (JSTOR Daily2y) John A. Jacquez, Frances J. Mather and Charles R. Crawford The theory of simple linear regression is extended to the case of non-uniform error variances for the

CONDITION NUMBER FOR WEIGHTED LINEAR LEAST SQUARES PROBLEM (JSTOR Daily9mon) In this paper, we investigate the condition numbers for the generalized matrix inversion and the rank deficient linear least squares problem: $\min_x \|Ax-b\|_2$, where A is an m -by- n ($m \geq n$) rank deficient

CONDITION NUMBER FOR WEIGHTED LINEAR LEAST SQUARES PROBLEM (JSTOR Daily9mon) In this paper, we investigate the condition numbers for the generalized matrix inversion and the rank deficient linear least squares problem: $\min_x \|Ax-b\|_2$, where A is an m -by- n ($m \geq n$) rank deficient

Back to Home: <https://explore.gcts.edu>