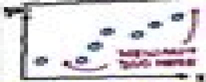
NUMERICAL METHODS

r/KAPFY | EXAM 2 | 11/14/2022 | [illegible]

LEAST SQUARES REGRESSION



GOAL: MINIMIZE THE SUM OF THE SQUARE OF THE RESIDUAL ERRORS

$$S_r = \sum_{i=1}^{n} e_i^2 = \sum_{i=1}^{n} (y_i - a_0 - a_1 x_i)^2$$

$$a_1 = \frac{n\sum(y_i x_i) - \sum y_i \sum x_i}{n\sum(x_i^2) - (\sum x_i)^2}$$

$$a_0 = \frac{\sum y_i}{n} - a_1 \frac{\sum x_i}{n} \rightarrow a_0 = \bar{y} - a_1 \bar{x}$$

$a_0 = \bar{y} - a_1 \bar{x}$

$y = a_0 + a_1 x$

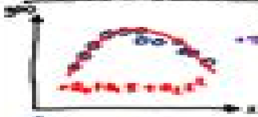
STANDARD ERROR:

$$s_{y/x} = \sqrt{\frac{S_r}{n-2}} \qquad s_{y/x} = \sqrt{\frac{\sum (y_i - y^{fit})^2}{n-2}}$$

STAND DEVIATION:

$$s_y = \sqrt{\frac{S_t}{n-1}} \qquad s_y = \sqrt{\frac{\sum (y_i - \bar{y})^2}{n-1}}$$

POLYNOMIAL QUADRATIC REGRESSION:



$$S_r = \sum_{i=1}^{n} (y_i - a_0 - a_1 x_i - a_2 x_i^2)^2$$

TAKE DERIVATIVE [illegible]

$$\frac{\partial S_r}{\partial a_0} = -2\left(\sum y_i - \sum a_0 - a_1 \sum x_i - a_2 \sum x_i^2\right) = 0$$

$$\frac{\partial S_r}{\partial a_1} = -2\left(\sum y_i x_i - \sum a_0 \sum x_i - a_1 \sum x_i^2 - a_2 \sum x_i^3\right) = 0$$

$$\frac{\partial S_r}{\partial a_2} = -2\left(\sum y_i x_i^2 - \sum a_0 \sum x_i^2 - a_1 \sum x_i^3 - a_2 \sum x_i^4\right) = 0$$

$\sum_{i=1}^{n} a_0 = a_0 n$

$$\begin{bmatrix} n & \sum x_i & \sum x_i^2 \\ \sum x_i & \sum x_i^2 & \sum x_i^3 \\ \sum x_i^2 & \sum x_i^3 & \sum x_i^4 \end{bmatrix} \begin{bmatrix} a_0 \\ a_1 \\ a_2 \end{bmatrix} = \begin{bmatrix} \sum y_i \\ \sum x_i y_i \\ \sum x_i^2 y_i \end{bmatrix} \rightarrow [A][X] = [B]$$

[A] [X] [B]

$x = A \backslash B$

$$s_{y/x} = \sqrt{\frac{S_r}{n-(m+1)}}$$

data points; [illegible] coefficients

COEFFICIENT OF DETERMINATION

$$r^2 = \frac{S_t - S_r}{S_t}$$

INTERPOLATION

- USE A POLYNOMIAL FIT:

1 DEGREE: 2 PTS, 2 UNKNOWNS | DEGREE 2: 3 POINTS, 3 UNKNOWNS | DEGREE 3: 4 PTS, 4 UNKNOWNS | DEGREE n: n+1 PTS, n+1 UNKNOWNS

$$P_n(x) = a_0 + a_1 x + a_2 x^2 + \dots + a_n x^n$$

ORDER		TURNS
n = 1		0
n = 2		1
n = 3		2
n = 4		3
n = n		n − 1

SPLINES:

$$m_i = \frac{f(x_{i+1}) - f(x_i)}{x_{i+1} - x_i}$$

ODE'S

- EULER'S METHOD:

$$\frac{dy(x)}{dx} = f(x,y) \qquad y_{i+1} = y_i + f(x_i, y_i)h$$

- TAYLOR SERIES:

$$y(x+\Delta x) = y(x) + \frac{dy}{dx}(x,y)\Delta x$$

$$y(x+\Delta x) = y(x) + f(x,y)\Delta x$$

- HEUN'S METHOD:

$$\frac{dy(x)}{dx} = f(x,y)$$

$$y_{i+1}^0 = y_i + f(x_i, y_i)\Delta x \quad \text{(predictor)}$$

$$\frac{dy_{i+1}}{dx} = y'_{i+1} = f(x_{i+1}, y_{i+1}^0)$$

$$\frac{dy_i}{dx} = y'_i = f(x_i, y_i)$$

$$\bar{y}' = \frac{y'_i + y'_{i+1}}{2} = \frac{f(x_i, y_i) + f(x_{i+1}, y_{i+1}^0)}{2}$$

$$y_{i+1} = y_i + \frac{f(x_i, y_i) + f(x_{i+1}, y_{i+1}^0)}{2}\Delta x \quad \text{(corrector)}$$

CLASSIC 4th ORDER RUNGE-KUTTA:

$$y_{i+1} = y_i + \frac{1}{6}(k_1 + 2k_2 + 2k_3 + k_4)\Delta x$$

$$k_1 = f(x_i, y_i)$$

$$k_2 = f\left(x_i + \tfrac{1}{2}\Delta x,\ y_i + \tfrac{1}{2}k_1\Delta x\right)$$

$$k_3 = f\left(x_i + \tfrac{1}{2}\Delta x,\ y_i + \tfrac{1}{2}k_2\Delta x\right)$$

$$k_4 = f(x_i + \Delta x,\ y_i + k_3\Delta x)$$

DORMAND PRINCE RUNGE-KUTTA

$$y_{i+1} = y_i + \Delta x \sum_{j=1}^{n} a_j k_j \quad \text{LOWER ORDER}$$

$$y_{i+1} = y_i + \Delta x \sum_{j=1}^{n} a_j k_j \quad \text{HIGHER ORDER}$$

EIGEN VALUES eig()

λ = EIGEN VALUE

EXAMPLE:

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$$\begin{bmatrix} a_{11}-\lambda & a_{12} & a_{13} \\ a_{21} & a_{22}-\lambda & a_{23} \\ a_{31} & a_{32} & a_{33}-\lambda \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

SIMPLE 2×2:

$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \quad \begin{bmatrix} a & b \\ c & d \end{bmatrix}^{-1} = \frac{1}{\det(A)}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

$$[x] = \frac{1}{\det(A)}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}\begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

$$\begin{bmatrix} a-\lambda & b \\ c & d-\lambda \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

$$\lambda = \frac{+(a+d) \pm \sqrt{(a+d)^2 - 4(ad-bc)}}{2}$$

PLUG EIGEN VALUES INTO SYSTEM:

$1x_1 + 1x_2 = 0 \quad x_1 = -x_2$

$1x_1 + 1x_2 = 0 \quad x_1 = -x_2$

$x_2 = 1$, $x_1 = -1$

- EIGEN VECTOR: $x_1 = \begin{bmatrix} 1 \\ -1 \end{bmatrix}$

$-1x_1 + 1x_2 = 0 \quad x_1 = x_2$

$1x_1 - 1x_2 = 0 \quad x_1 = x_2$

$x_1 = 1$, $x_2 = 1$

- 2nd EIGENVECTOR: $[x_2] = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$

PDE'S

FINITE DIFFERENCE METHOD:

TEMPERATURE

DIRICHLET:

BC:

- TEMP KNOWN @ BOUNDARY

SIMPLIFIED HEAT EQN:

$$u_t = k(u_{xx} + u_{yy} + u_{zz}) + q$$

$$u_{xx} + u_{yy} = 0$$

- CENTRAL DIFFERENCE

$$u_{xx}(x,y) = \frac{u(x-\Delta x, y) - 2u(x,y) + u(x+\Delta x, y)}{\Delta x^2}$$

$$u_{yy}(x,y) = \frac{u(x, y-\Delta y) - 2u(x,y) + u(x, y+\Delta y)}{\Delta y^2}$$

NEUMANN:

BC:

- TEMP DERIVATIVE KNOWN ON BOUNDARY

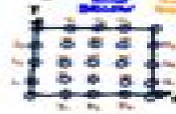
CENTRAL DIFFERENCE:

$$\frac{\partial u}{\partial x} = u_x = \frac{u_{i+1,j} - u_{i-1,j}}{2\Delta x}$$

$$\frac{\partial u}{\partial y} = u_y = \frac{u_{i,j+1} - u_{i,j-1}}{2\Delta x}$$

5th ROW OF A MATRIX

$$[\,0\ \ -1\ \ 0\ \ -1\ \ 4\ \ -1\ \ 0\ \ -1\ \ 0\,][u] = 0$$



RIGHT NEUMANN B.C.	BOTTOM NEUMANN B.C.	TOP NEUMANN BC	LEFT NEUMANN B.C.
$\frac{\partial u}{\partial x} = u_x = \frac{u_{i+1,j} - u_{i-1,j}}{2\Delta x}$	$\frac{\partial u}{\partial y} = u_y = \frac{u_{i,j+1} - u_{i,j-1}}{2\Delta y}$	$\frac{\partial u}{\partial y} = u_y = \frac{u_{i,j+1} - u_{i,j-1}}{2\Delta x}$	$u_{i-1,j} = u_{i+1,j} - 2\Delta x G_x$
$u_{i+1,j} = u_{i-1,j} + 2\Delta x G$	$u_{i,j-1} = u_{i,j+1} - 2\Delta x G_y$	$u_{i,j+1} = u_{i,j-1} + 2\Delta x G_y$	

[A] MATRIX:

$$-u_{i-1,j} + 4u_{i,j} - u_{i,j-1} - u_{i,j+1} = 2\Delta x G_x$$

LEFT:

$$-2u_{i+1,j} + 4u_{i,j} - u_{i,j-1} - u_{i,j+1} = -2\Delta x G_x$$

THIS CHANGED

RIGHT:

$$-2u_{i-1,j} + 4u_{i,j} - u_{i,j-1} - u_{i,j+1} = -2\Delta x G_x$$

THIS CHANGED

BOTTOM:

$$-u_{i-1,j} - u_{i+1,j} + 4u_{i,j} - 2u_{i,j+1} = -2\Delta x G_x$$

THIS CHANGED

TOP:

$$-u_{i-1,j} - u_{i+1,j} + 4u_{i,j} - 2u_{i,j-1} = -2\Delta x G_y$$

THIS CHANGED

MISC EQNS:

CENTERED FINITE-DIVIDED DIFF. FORMULAS:

FIRST:

$$f'(x_i) = \frac{f(x_{i+1}) - f(x_{i-1})}{2h}$$

$$f'(x_i) = \frac{-f(x_{i+2}) + 8f(x_{i+1}) - 8f(x_{i-1}) + f(x_{i-2})}{12h}$$

Numerical Analysis Lecture Notes Math User Home Pages

AW Chickering

Numerical Analysis Lecture Notes Math User Home Pages:

This book delves into Numerical Analysis Lecture Notes Math User Home Pages. Numerical Analysis Lecture Notes Math User Home Pages is an essential topic that needs to be grasped by everyone, from students and scholars to the general public. This book will furnish comprehensive and in-depth insights into Numerical Analysis Lecture Notes Math User Home Pages, encompassing both the fundamentals and more intricate discussions.

1. This book is structured into several chapters, namely:
    - Chapter 1: Introduction to Numerical Analysis Lecture Notes Math User Home Pages
    - Chapter 2: Essential Elements of Numerical Analysis Lecture Notes Math User Home Pages
    - Chapter 3: Numerical Analysis Lecture Notes Math User Home Pages in Everyday Life
    - Chapter 4: Numerical Analysis Lecture Notes Math User Home Pages in Specific Contexts
    - Chapter 5: Conclusion
2. In chapter 1, the author will provide an overview of Numerical Analysis Lecture Notes Math User Home Pages. The first chapter will explore what Numerical Analysis Lecture Notes Math User Home Pages is, why Numerical Analysis Lecture Notes Math User Home Pages is vital, and how to effectively learn about Numerical Analysis Lecture Notes Math User Home Pages.
3. In chapter 2, this book will delve into the foundational concepts of Numerical Analysis Lecture Notes Math User Home Pages. The second chapter will elucidate the essential principles that must be understood to grasp Numerical Analysis Lecture Notes Math User Home Pages in its entirety.
4. In chapter 3, the author will examine the practical applications of Numerical Analysis Lecture Notes Math User Home Pages in daily life. The third chapter will showcase real-world examples of how Numerical Analysis Lecture Notes Math User Home Pages can be effectively utilized in everyday scenarios.
5. In chapter 4, this book will scrutinize the relevance of Numerical Analysis Lecture Notes Math User Home Pages in specific contexts. This chapter will explore how Numerical Analysis Lecture Notes Math User Home Pages is applied in specialized fields, such as education, business, and technology.
6. In chapter 5, the author will draw a conclusion about Numerical Analysis Lecture Notes Math User Home Pages. The final chapter will summarize the key points that have been discussed throughout the book.

This book is crafted in an easy-to-understand language and is complemented by engaging illustrations. This book is highly recommended for anyone seeking to gain a comprehensive understanding of Numerical Analysis Lecture Notes Math User Home Pages.

https://matrix.jamesarcher.co/results/book-search/index.jsp/Quick_Start_AI_In_Everyday_Life.pdf

Table of Contents Numerical Analysis Lecture Notes Math User Home Pages

Numerical Analysis Lecture Notes Math User Home Pages Introduction

In todays digital age, the availability of Numerical Analysis Lecture Notes Math User Home Pages books and manuals for download has revolutionized the way we access information. Gone are the days of physically flipping through pages and carrying heavy textbooks or manuals. With just a few clicks, we can now access a wealth of knowledge from the comfort of our own homes or on the go. This article will explore the advantages of Numerical Analysis Lecture Notes Math User Home Pages books and manuals for download, along with some popular platforms that offer these resources. One of the significant advantages of Numerical Analysis Lecture Notes Math User Home Pages books and manuals for download is the cost-saving aspect. Traditional books and manuals can be costly, especially if you need to purchase several of them for educational or professional purposes. By accessing Numerical Analysis Lecture Notes Math User Home Pages versions, you eliminate the need to spend money on physical copies. This not only saves you money but also reduces the environmental impact associated with book production and transportation. Furthermore, Numerical Analysis Lecture Notes Math User Home Pages books and manuals for download are incredibly convenient. With just a computer or smartphone and an internet connection, you can access a vast library of resources on any subject imaginable. Whether youre a student looking for textbooks, a professional seeking industry-specific manuals, or someone interested in self-improvement, these digital resources provide an efficient and accessible means of acquiring knowledge. Moreover, PDF books and manuals offer a range of benefits compared to other digital formats. PDF files are designed to retain their formatting regardless of the device used to open them. This ensures that the content appears exactly as intended by the author, with no loss of formatting or missing graphics. Additionally, PDF files can be easily annotated, bookmarked, and searched for specific terms, making them highly practical for studying or referencing. When it comes to accessing Numerical Analysis Lecture Notes Math User Home Pages books and manuals, several platforms offer an extensive collection of resources. One such platform is Project Gutenberg, a nonprofit organization that provides over 60,000 free eBooks. These books are primarily in the public domain, meaning they can be freely distributed and downloaded. Project Gutenberg offers a wide range of classic literature, making it an excellent resource for literature enthusiasts. Another popular platform for Numerical Analysis Lecture Notes Math User Home Pages books and manuals is Open Library. Open Library is an initiative of the Internet Archive, a non-profit organization dedicated to digitizing cultural artifacts and making them accessible to the public. Open Library hosts millions of books, including both public domain works and contemporary titles. It also allows users to borrow digital copies of certain books for a limited period, similar to a library lending system. Additionally, many universities and educational institutions have their own digital libraries that provide free access to PDF books and manuals. These libraries often offer academic texts, research papers, and technical manuals, making them invaluable resources for students and researchers. Some notable examples include MIT OpenCourseWare, which offers free access to course materials from the Massachusetts Institute of Technology, and the Digital Public Library of America, which provides a vast collection of digitized books and historical documents. In conclusion, Numerical Analysis Lecture Notes Math User Home Pages books and manuals for download have transformed the way we access information. They provide a cost-effective and convenient means of acquiring knowledge, offering the ability to access a vast library of resources at our fingertips. With platforms like Project Gutenberg, Open Library, and various digital libraries offered by educational institutions, we have access to an ever-expanding collection of books and manuals. Whether for educational, professional, or personal purposes, these digital resources serve as valuable tools for continuous learning and self-improvement. So why not take advantage of the vast world of Numerical Analysis Lecture Notes Math User Home Pages books and manuals for download and embark on your journey of knowledge?

FAQs About Numerical Analysis Lecture Notes Math User Home Pages Books

How do I know which eBook platform is the best for me? Finding the best eBook platform depends on your reading preferences and device compatibility. Research different platforms, read user reviews, and explore their features before making a choice. Are free eBooks of good quality? Yes, many reputable platforms offer high-quality free eBooks, including classics and public domain works. However, make sure to verify the source to ensure the eBook credibility. Can I read eBooks without an eReader? Absolutely! Most eBook platforms offer web-based readers or mobile apps that allow you to read eBooks on your computer, tablet, or smartphone. How do I avoid digital eye strain while reading eBooks? To prevent digital eye strain, take regular breaks, adjust the font size and background color, and ensure proper lighting while reading eBooks. What the advantage of interactive eBooks? Interactive eBooks incorporate multimedia elements, quizzes, and activities, enhancing the reader engagement and providing a more immersive learning experience. Numerical Analysis Lecture Notes Math User Home Pages is one of the best book in our library for free trial. We provide copy of Numerical Analysis Lecture Notes Math User Home Pages in digital format, so the resources that you find are reliable. There are also many Ebooks of related with Numerical Analysis Lecture Notes Math User Home Pages. Where to download Numerical Analysis Lecture Notes Math User Home Pages online for free? Are you looking for Numerical Analysis Lecture Notes Math User Home Pages PDF? This is definitely going to save you time and cash in something you should think about.

Find Numerical Analysis Lecture Notes Math User Home Pages :

quick start AI in everyday life
language learning manual ultimate guide
coloring activity book hardcover
emotional intelligence for kids collection
personal finance literacy training guide

AI usage manual award winning
home DIY manual fan favorite
illustrated guide knitting and crochet manual
2025 edition sight words learning
guitar learning manual award winning
fan favorite car repair manual
manual book numbers counting book
~~ultimate guide romantasy saga~~
~~ebook friendship stories kids~~
home DIY manual complete workbook

Numerical Analysis Lecture Notes Math User Home Pages :

Chemistry Final Exam Review (Hanover Horton High School) Start studying Chemistry Final Exam Review (Hanover Horton High School). Learn vocabulary, terms, and more with flashcards, games, and other study tools. CHEMISTRY TEST REVIEW OVER MOLES UNIT Moles Practice Test At STP, which sample contains the same number of molecules as 11.2 liters of CO2(g) at STP? Page 4. Answer Key moles practice test. 1. C. 2. C. 3. D. 4. C. 5. A. Nadeb videos 6 years ago. 1:25. Nadeb. Mole Test Review Answer Key Horton High School. 6 years ago. 1:25. Nadeb. How To Replace Drive Belt On Yamaha Stratoliner. 6 years ago. Stoichiometry Review Sheets 2.pdf X moles = 399. 26. LIFE 7+ 19. Page 7. Name: Answer Key. 1. Base your answer to ... Determine the total number of moles of CO2 produced during the lantern test. Relative Mass and the Mole answer key Use a periodic table to answer the following questions. a. Fluorine gas consists of diatomic molecules of fluorine (F). How many molecules of fluorine are in ... Conceptual Chemistry MOLES & EMPIRICAL FORMULA ... May 5, 2020 — Conceptual Chemistry MOLES & EMPIRICAL FORMULA Test Review 1. A mole is equal to : representative particles grams liters (for gases only) 2. Msrazz chem class the mole answer key ... mole answer key Balancing combustion Chemistry test review answers - earthstaff. ... High School chemistry is one of the most high-yield areas for study. pogil ... Gif Dr Doe is here to test your knowledge of chemistry! Answer correctly, she strips. Made using the Topaz Gigapixel AI 5. Stay on topic, be respectful, no low ... 1242 angel number This number also represents new beginnings fresh starts and positive change. So if you see the 1242 angel number it's a reminder to get clear on what you ... Chrome Music Lab These tools make it easier for coders to build new interactive music experiences. You can get the open-source code to lots of these experiments here on Github. New Beginnings An Evening of Luv - The luv u Project This private golf club has a rich history in the Washington DC area and has been open since the 1920's. Congressional has been home to many PGA Tour events over ... @COACHPRIME

(@deionsanders) • Instagram photos and ... I'm in my Purpose: Head Coach @cubuffsfootball "I Ain't Hard 2 Find" Rep: @smacentertainment · keychain.club/DeionSanders. AD (@iitsad) • Instagram photos and videos I stand with my brothers forever new beginnings new blessings tune in to our new Show ... Thank you everybody & see you tonight @figgmunityworld. Me, @otgenasis ... MSU Libraries: Home To obtain items located on 4 East, please place an online request for the item to be paged for you using the 'Place Request' button in the catalog. Please visit ... Cycle Car Age and Ignition, Carburetion, Lubrication Inorganic Chemistry Student Solution Manual Inorganic Chemistry (4th Edition). Gary L. Miessler ; Student Solutions Manual for Inorganic Chemistry. Catherine Housecroft ; Principles of Instrumental Analysis. Gary L Miessler Solutions Books by Gary L Miessler with Solutions ; INORGANIC CHEMISTRY & SOLUTIONS MANUAL PKG 4th Edition 486 Problems solved, Donald A. Tarr, Gary Miessler, Gary L. Student Solutions Manual: Inorganic Chemistry, Fourth ... Authors, Gary L. Miessler, Donald Arthur Tarr ; Edition, 4 ; Publisher, Pearson Prentice Hall, 2011 ; ISBN, 013612867X, 9780136128670 ; Length, 170 pages. Inorganic Chemistry Solutions Manual by Gary L Miessler Buy Inorganic Chemistry 4Th Edition By Gary L Miessler Donald A Tarr Isbn 0321811054 9780321811059 5th edition 2013. Inorganic chemistry, fourth edition, Gary L. Miessler ... Student solutions manual : Inorganic chemistry, fourth edition, Gary L. Miessler, Donald A. Tarr ; Genre: Problemas, ejercicios, etc ; Physical Description: 170 p ... Solutions Manual Inorganic Chemistry by Donald A. Tarr ... Solutions Manual Inorganic Chemistry by Donald A. Tarr and Gary L. Miessler (2003, Perfect). Inorganic Chemistry - 4th Edition - Solutions and Answers Our resource for Inorganic Chemistry includes answers to chapter exercises, as well as detailed information to walk you through the process step by step. With ... Inorganic Chemistry (Solutions Manual) - Miessler, Gary L. This introduction to inorganic chemistry emphasizes the use of bonding theories to explain the structures and reactions of inorganic compounds. From the Inside ... [Book] Solutions Manual for Inorganic Chemistry, 5th Edition [Book] Solutions Manual for Inorganic Chemistry, 5th Edition. Requesting. ISBN-13: 9780321814135. Solution Manual for Inorganic Chemistry 4th Edition Solution Manual for Inorganic Chemistry 4th Edition by Miessler Gary from Flipkart.com. Only Genuine Products. 30 Day Replacement Guarantee. Free Shipping.