1. Record Nr. UNINA9910860821303321

Autore	Badiru Adedeji Bodunde <1952->
Titolo	Data analytics : handbook of formulas and techniques / / Adedeji Badiru
Pubbl/distr/stampa	Boca Raton : , : CRC Press, , 2020
ISBN	1-00-308314-5 1-003-08314-5 1-000-29733-0 1-000-29735-7
Edizione	[1st ed.]
Descrizione fisica	1 online resource (273 pages) : illustrations
Collana	Systems innovation
Disciplina	001.42
Soggetti	Quantitative research Information visualization Engineering mathematics - Formulae
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Cover -- Half Title -- Series Page -- Title Page -- Copyright Page -- Dedication -- Table of Contents -- Preface -- Acknowledgments -- Author -- Chapter 1 Essentials of Data Analytics -- Introduction to COVID-19 Data Analytics -- Systems View of Data Analytics -- Global Growth of Data Analytics -- Background in Predictive Analytics -- Data Modeling Approaches -- Data Fanaticism -- Data and Measurements for Data Analytics -- What is Measurement? -- Data Measurement Systems -- Fundamental Scientific Equations -- Einstein's Equation -- Einstein's Field Equation -- Heisenberg's Uncertainty Principle -- Schrödinger Equation -- Dirac Equation -- Maxwell's Equations -- Boltzmann's Equation for Entropy -- Planck-Einstein Equation -- Planck's Blackbody Radiation Formula -- Hawking Equation for Black Hole Temperature -- Navier-Stokes Equation for a Fluid -- Lagrangian for Quantum Chromodynamics -- Bardeen-Cooper-Schrieffer Equation for Superconductivity -- Josephson Effect -- Fermat's Last Theorem -- Methods for Data Measurement and Comparison -- Direct Comparison -- Indirect Comparison -- Data Measurement Scales -- Nominal Scale of Measurement -- Ordinal Scale of Measurement -- Interval Scale of

Measurement -- Ratio Scale Measurement -- Reference Units of Measurements -- Common Constants -- Numeric Data Representation -- The Language of Data Analytics -- Quick Reference for Mathematical Equations -- Reference -- Chapter 2 Empirical Model Building -- Introduction to the Model Environment -- State-Space Modeling -- Calculus Reference for Data Analytics -- Integration Rules -- Solving Integrals with Variable Substitution -- Riemann Integral -- Integration by Parts -- Compound Functions Where the Inner Function is ax -- Integration by Parts -- Systems Modeling for Data Analytics -- Triple C Questions -- Communication -- Cooperation -- Coordination.
Conflict Resolution in Data Analytics -- References -- Chapter 3 Data Visualization Methods -- Introduction to Data Visualization -- Case Example of "Covidvisualizer" Website -- Dynamism and Volatility of Data -- Data Determination and Collection -- Choosing the Data -- Collecting the Data -- Relevance Check -- Limit Check -- Critical Value -- Coding the Data -- Processing the Data -- Control Total -- Consistency Check -- Scales of Measurement -- Using the Information -- Data Exploitation -- Raw Data -- Total Revenue -- Average Revenue -- Median Revenue -- Quartiles and Percentiles -- The Mode -- Range of Revenue -- Average Deviation -- Sample Variance -- Standard Deviation -- Chapter 4 Basic Mathematical Calculations for Data Analytics -- Introduction to Calculation for Data Analytics -- Quadratic Equation -- Overall Mean -- Chebyshev's Theorem -- Permutations -- Combinations -- Failure -- Probability Distribution -- Probability -- Distribution Function -- Expected Value -- Variance -- Binomial Distribution -- Poisson Distribution -- Mean of a Binomial Distribution -- Variance -- Normal Distribution -- Cumulative Distribution Function -- Population Mean -- Standard Error of the Mean -- t-Distribution -- Chi-Squared Distribution -- Definition of Set and Notation -- Set Terms and Symbols -- Venn Diagrams -- Operations on Sets -- De Morgan's Laws -- Probability Terminology -- Basic Probability Principles -- Random Variable -- Mean Value xˆ or Expected Value -- Series Expansions -- Mathematical Signs and Symbols -- Greek Alphabet -- Algebra -- Laws of Algebraic Operations -- Special Products and Factors -- Powers and Roots -- Proportion -- Arithmetic Mean of n Quantities A -- Geometric Mean of n Quantities G -- Harmonic Mean of n Quantities H -- Generalized Mean -- Solution of Quadratic Equations -- Solution of Cubic Equations.
Trigonometric Solution of the Cubic Equation -- Solution of Quadratic Equations -- Partial Fractions -- Non-repeated Linear Factors -- Repeated Linear Factors -- General Terms -- Repeated Linear Factors -- Factors of Higher Degree -- Geometry -- Triangles -- Right Triangle -- Equilateral Triangle -- General Triangle -- Menelaus's Theorem -- Ceva's Theorem -- Quadrilaterals -- Rectangle -- Parallelogram -- Rhombus -- Trapezoid -- General Quadrilateral -- Regular Polygon of n Sides Each of Length b -- Regular Polygon of n Sides Inscribed in a Circle of Radius r -- Regular Polygon of n Sides Circumscribing a Circle of Radius r -- Cyclic Quadrilateral -- Prolemy's Theorem -- Cyclic-Inscriptable Quadrilateral -- Planar Areas by Approximation -- Trapezoidal Rule -- Durand's Rule -- Simpson's Rule (n even) -- Weddle's Rule (n = 6) -- Solids Bounded by Planes -- Cube -- Rectangular Parallelepiped (or Box) -- Prism -- Pyramid -- Prismatoid -- Regular Polyhedra -- Sphere of Radius r -- Right Circular Cylinder of Radius r and Height h -- Circular Cylinder of Radius r and Slant Height l -- Cylinder of Cross-Sectional Area A and Slant Height l -- Right Circular Cone of Radius r and Height h -- Spherical Cap of Radius rand Height h -- Frustum of Right Circular Cone of Radii a, b and Height h -- Zone and Segment of Two Bases -- Lune -- Spherical Sector --

Spherical Triangle and Polygon -- Spheroids -- Ellipsoid -- Oblate Spheroid -- Prolate Spheroid -- Circular Torus -- Formulas from Plane Analytic Geometry -- Distance d between Two Points -- Slope m of Line Joining Two Points -- Equation of Line Joining Two Points -- Equation of Line in Terms of x Intercept a 0 and y intercept b 0 -- Normal Form for Equation of Line -- General Equation of Line -- Distance from Point (x[sub(1)], y[sub(1)]) to Line Ax + By + C = 0. Angle between Two Lines Having Slopes m[sub(1)] and m[sub(2)] -- Area of Triangle with Verticles -- Transformation of Coordinates Involving Pure Translation -- Transformation of Coordinates Involving Pure Rotation -- Transformation of Coordinates Involving Translation and Rotation -- Polar Coordinates (r,) -- Plane Curves -- Catenary, Hyperbolic Cosine -- Cardioid -- Circle -- Cassinian Curves -- Cotangent Curve -- Cubical Parabola -- Cosecant Curve -- Cosine Curve -- Ellipse -- Gamma Function -- Hyperbolic Functions -- Inverse Cosine Curve -- Inverse Sine Curve -- Inverse Tangent Curve -- Logarithmic Curve -- Parabola -- Cubical Parabola -- Tangent Curve -- Ellipsoid -- Elliptic Cone -- Elliptic Cylinder -- Hyperboloid of One Sheet -- Elliptic Paraboloid -- Hyperboloid of Two Sheets -- Hyperbolic Paraboloid -- Sphere -- Distance d between Two Points -- Equations of Line Joining P[sub(1)](x[sub(1)], y[sub(1)], z[sub(1)]) and P[sub(2)](x[sub(2)], y[sub(2)], z[sub(2)]) in Standard Form -- Equations of Line Joining P[sub(1)](x[sub(1)], y[sub(1)],z[sub(1)]) and P[sub(2)](x[sub(2)], y[sub(2)], z[sub(2)]) in Parametric Form -- Angle between Two Lines with Direction Cosines -- General Equation of a Plane -- Equation of Plane Passing through Points -- Equation of Plane in Intercept Form -- Equations of Line through (x[sub(0)], y[sub(0)], z[sub(0)]) and Perpendicular to Plane -- Distance from Point (x, y, z) to Plane Ax + By + D= 0 -- Normal form for Equation of Plane -- Transformation of Coordinates Involving Pure Translation -- Transformation of Coordinates Involving Pure Rotation -- Transformation of Coordinates Involving Translation and Rotation -- Cylindrical Coordinates (r, , z) -- Spherical Coordinates (r, ,) -- Logarithmic Identities -- Special Values -- Logarithms to General Base -- Series Expansions -- Limiting Values -- Inequalities.
Continued Fractions -- Polynomial Approximations -- Fundamental Properties -- Definition of General Powers -- Logarithmic and Exponential Functions -- Polynomial Approximations -- Slopes -- Trigonometric Ratios -- Sine Law -- Cosine Law -- Algebra -- Expanding -- Factoring -- Roots of Quadratic -- Law of Exponents -- Logarithms -- Chapter 5 Statistical Methods for Data Analytics -- Introduction -- Discrete Distributions -- Bernoulli Distribution -- Beta Binomial Distribution -- Beta Pascal Distribution -- Binomial Distribution -- Discrete Weibull Distribution -- Geometric Distribution -- Hypergeometric Distribution -- Negative Binomial Distribution -- Poisson Distribution -- Rectangular (Discrete Uniform) Distribution -- Continuous Distributions -- Arcsin Distribution -- Beta Distribution -- Cauchy Distribution -- Chi Distribution -- Chi-Square Distribution -- Erlang Distribution -- Exponential Distribution -- Extreme-Value Distribution -- F Distribution -- Gamma Distribution -- Half-Normal Distribution -- Laplace (Double Exponential) Distribution -- Logistic Distribution -- Lognormal Distribution -- Noncentral Chi-Square Distribution -- Noncentral F Distribution -- Noncentral t Distribution -- Normal Distribution -- Pareto Distribution -- Rayleigh Distribution -- t Distribution -- Triangular Distribution -- Uniform Distribution -- Weibull Distribution -- Distribution Parameters -- Average -- Variance -- Standard Deviation -- Standard Error -- Skewness -- Standardized Skewness -- Kurtosis -- Standardized Kurtosis -- Weighted Average --

Estimation and Testing -- 100(1)% Confidence Interval for Mean -- 100(1)% Confidence Interval for Variance -- 100(1)% Confidence Interval for Difference in Means -- Equal Variance -- Unequal Variance -- 100(1)% Confidence Interval for ratio of variances -- Normal Probability Plot.
Comparison of Poisson Rates.

Sommario/riassunto

Good data analytics is the basis for effective decisions. Whoever has the data, has the ability to extract information promptly and effectively to make pertinent decisions. The premise of this handbook is to empower users and tool developers with the appropriate collection of formulas and techniques for data analytics and to serve as a quick reference to keep pertinent formulas within fingertip reach of readers. This handbook includes formulas that will appeal to mathematically inclined readers. It discusses how to use data analytics to improve decision-making and is ideal for those new to using data analytics to show how to expand their usage horizon. It provides quantitative techniques for modeling pandemics, such as COVID-19. It also adds to the suite of mathematical tools for emerging technical areas. This handbook is a handy reference for researchers, practitioners, educators, and students in areas such as industrial engineering, production engineering, project management, civil engineering, mechanical engineering, technology management, and business management worldwide.