

NINTH EDITION IN SI UNITS

Shigley's Mechanical Engineering Design

RICHARD G. BUDYNAS
J. KEITH NISBETT



Shigley Mechanical Engineering Design 9th Edition Solutions

Shahin S. Nudehi, John R. Steffen



Shigley Mechanical Engineering Design 9th Edition Solutions:

AI-Based Solutions for Engineering Yücel, Melda, Oral, Hasan Volkan, 2025-08-08 Artificial intelligence AI and machine learning ML are rapidly transforming how complex engineering and environmental challenges are addressed across disciplines These technologies offer advanced adaptive and efficient solutions for nonlinear problems in civil mechanical electrical and environmental engineering enabling more accurate modeling prediction and optimization The integration of these approaches reflects a growing interdisciplinary shift where digital intelligence supports both technological advancement and ecological responsibility As global priorities align toward innovation and sustainability leveraging AI across engineering fields has the potential to shape smarter societies *AI Based Solutions for Engineering* explores the applications and novel solutions of engineering problems by using AI and its methodologies It realizes the solutions for different engineering problems with the contribution of AI technology Covering topics such action classification edge devices and wastewater treatment this book is an excellent resource for developers engineers policymakers researchers academicians and more

Mechanical Design of Machine Components Ansel C. Ugural, 2018-09-03 Analyze and Solve Real World Machine Design Problems Using SI Units *Mechanical Design of Machine Components* Second Edition SI Version strikes a balance between method and theory and fills a void in the world of design Relevant to mechanical and related engineering curricula the book is useful in college classes and also serves as a reference for practicing engineers This book combines the needed engineering mechanics concepts analysis of various machine elements design procedures and the application of numerical and computational tools It demonstrates the means by which loads are resisted in mechanical components solves all examples and problems within the book using SI units and helps readers gain valuable insight into the mechanics and design methods of machine components The author presents structured worked examples and problem sets that showcase analysis and design techniques includes case studies that present different aspects of the same design or analysis problem and links together a variety of topics in successive chapters SI units are used exclusively in examples and problems while some selected tables also show U S customary USCS units This book also presumes knowledge of the mechanics of materials and material properties New in the Second Edition Presents a study of two entire real life machines Includes Finite Element Analysis coverage supported by examples and case studies Provides MATLAB solutions of many problem samples and case studies included on the book s website Offers access to additional information on selected topics that includes website addresses and open ended web based problems Class tested and divided into three sections this comprehensive book first focuses on the fundamentals and covers the basics of loading stress strain materials deflection stiffness and stability This includes basic concepts in design and analysis as well as definitions related to properties of engineering materials Also discussed are detailed equilibrium and energy methods of analysis for determining stresses and deformations in variously loaded members The second section deals with fracture mechanics failure criteria fatigue phenomena and surface damage of

components The final section is dedicated to machine component design briefly covering entire machines The fundamentals are applied to specific elements such as shafts bearings gears belts chains clutches brakes and springs **MATLAB® With Applications in Mechanics and Tribology** Burstein, Leonid, 2021-02-12 Among the wide range of programming tools available the technical analysis and calculations are realized by MATLAB which is recognized as a convenient and effective tool for modern science and technology Thus mastering its latest versions and practical solutions is increasingly essential for the creation of new products in mechanics electronics chemistry life sciences and modern industry Modern mechanical and tribology sciences specialists widely use computers and some special programs but need a universal tool for solving simulating and modeling specific problems from their area There is plenty of information available on MATLAB for the general engineer but there is a gap in the field for research that applies MATLAB to two wide interdisciplinary and topical areas tribology and mechanics MATLAB With Applications in Mechanics and Tribology explores how MATLAB is used as a tool for subsequent computer solutions applying it to both traditional and modern problems of mechanics and materials sciences The problem solving in this book includes calculations of the mechanical parts machine elements production process quality assurance fluid mechanics parameters thermodynamic and rheological properties of the materials as well as the state equations descriptive statistics and more This book is ideal for scientists students and professors of engineering courses self instructing readers programmers computer scientists practitioners and researchers looking for concise and clear information on learning and applying MATLAB software to mechanics tribology and material physics PDE Toolbox Primer for Engineering Applications with MATLAB® Basics Leonid Burstein, 2022-06-07 Partial differential equations PDEs describe technological phenomena and processes used for the analysis design and modeling of technical products Solutions of spatial and transient PDEs are realized by using the PDE Toolbox included in the MATLAB software MATLAB is introduced here as an essential foundation for PDE and the Modeler of the PDE Toolbox with appropriate explanatory solutions is applied to engineering problems in mechanics heat mass transfer tribology materials science physics and biotechnology The appendixes contain collections of commands and functions used to solve actual engineering problems FEATURES Includes the PDE Modeler interface with example solutions of two and three dimensional PDEs Presents methodologies for all types of PDEs as representative of any engineering problem Describes the ordinate differential equation ODE solver for initial value and boundary value problems IVP and BVP through practical examples from mechanics and the thermodynamic properties of materials Covers the basics of MATLAB to solve both ODEs and PDEs Reviews spatially the one dimensional PDE solver with actual engineering examples PDE Toolbox Primer for Engineering Applications with MATLAB Basics is aimed at scientists students professionals practitioners self taught readers and researchers who need concise and clear information to study and apply MATLAB software and the PDE Toolbox in engineering Fundamentals of Machine Elements Steven R. Schmid, Bernard J. Hamrock, Bo. O. Jacobson, 2014-07-18 New and Improved SI Edition Uses SI Units Exclusively in the

TextAdapting to the changing nature of the engineering profession this third edition of Fundamentals of Machine Elements aggressively delves into the fundamentals and design of machine elements with an SI version This latest edition includes a plethora of pedagogy providing a greater u

Analysis of Machine Elements Using SOLIDWORKS Simulation 2016 Shahin Nudehi,John Steffen,2016-05 Analysis of Machine Elements Using SOLIDWORKS Simulation 2016 is written primarily for first time SOLIDWORKS Simulation 2016 users who wish to understand finite element analysis capabilities applicable to stress analysis of mechanical elements The focus of examples is on problems commonly found in an introductory undergraduate Design of Machine Elements or similarly named courses In order to be compatible with most machine design textbooks this text begins with problems that can be solved with a basic understanding of mechanics of materials Problem types quickly migrate to include states of stress found in more specialized situations common to a design of mechanical elements course Paralleling this progression of problem types each chapter introduces new software concepts and capabilities Many examples are accompanied by problem solutions based on use of classical equations for stress determination Unlike many step by step user guides that only list a succession of steps which if followed correctly lead to successful solution of a problem this text attempts to provide insight into why each step is performed This approach amplifies two fundamental tenets of this text The first is that a better understanding of course topics related to stress determination is realized when classical methods and finite element solutions are considered together The second tenet is that finite element solutions should always be verified by checking whether by classical stress equations or experimentation Each chapter begins with a list of learning objectives related to specific capabilities of the SOLIDWORKS Simulation program introduced in that chapter Most software capabilities are repeated in subsequent examples so that users gain familiarity with their purpose and are capable of using them in future problems All end of chapter problems are accompanied by evaluation check sheets to facilitate grading assignments

Analysis of Machine Elements Using SOLIDWORKS Simulation 2021 Shahin S. Nudehi,John R. Steffen,2021-07-03 Designed for first time SOLIDWORKS Simulation users Focuses on examples commonly found in Design of Machine Elements courses Many problems are accompanied by solutions using classical equations Combines step by step tutorials with detailed explanations of why each step is taken Analysis of Machine Elements Using SOLIDWORKS Simulation 2021 is written primarily for first time SOLIDWORKS Simulation 2021 users who wish to understand finite element analysis capabilities applicable to stress analysis of mechanical elements The focus of examples is on problems commonly found in introductory undergraduate Design of Machine Elements or similarly named courses In order to be compatible with most machine design textbooks this text begins with problems that can be solved with a basic understanding of mechanics of materials Problem types quickly migrate to include states of stress found in more specialized situations common to a design of mechanical elements course Paralleling this progression of problem types each chapter introduces new software concepts and capabilities Many examples are accompanied by problem solutions based on use of

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Table of Contents Introduction 1 Stress Analysis Using SOLIDWORKS Simulation 2 Curved Beam Analysis 3 Stress Concentration Analysis 4 Thin and Thick Wall Pressure Vessels 5 Interference Fit Analysis 6 Contact Analysis 7 Bolted Joint Analysis 8 Design Optimization 9 Elastic Buckling 10 Fatigue Testing Analysis 11 Thermal Stress Analysis Appendix A Organizing Assignments Using MS Word Appendix B Alternate Method to Change Screen Background Color Index

Using the Engineering Literature, Second Edition Bonnie A. Osif, 2011-08-09 With the encroachment of the Internet into nearly all aspects of work and life it seems as though information is everywhere However there is information and then there is correct appropriate and timely information While we might love being able to turn to Wikipedia for encyclopedia like information or search Google for the thousands of links on a topic engineers need the best information information that is evaluated up to date and complete Accurate vetted information is necessary when building new skyscrapers or developing new prosthetics for returning military veterans While the award winning first edition of Using the Engineering Literature used a roadmap analogy we now need a three dimensional analysis reflecting the complex and dynamic nature of research in the information age Using the Engineering Literature Second Edition provides a guide to the wide range of resources available in all fields of engineering This second edition has been thoroughly revised and features new sections on nanotechnology as well as green engineering The information age has greatly impacted the way engineers find information Engineers have an effect directly and indirectly on almost all aspects of our lives and it is vital that they find the right information at the right time to create better products and processes Comprehensive and up to date with expert chapter authors this book fills a gap in the literature providing critical information in a user friendly format

Analysis of Machine Elements Using SOLIDWORKS Simulation 2018 Shahin Nudehi, John Steffen, 2018 Analysis of Machine Elements Using SOLIDWORKS Simulation 2018 is written primarily for first time SOLIDWORKS Simulation 2018 users who wish to understand finite element analysis capabilities applicable to stress analysis of mechanical elements The focus of examples is on problems commonly found in introductory undergraduate Design of Machine Elements or similarly named courses In order to be compatible with most machine design textbooks this text begins

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Contact Dynamics Nikolay Goloshchapov, 2019-02-08 This volume describes the application of the method of the differential specific forces MDSF By using this new method the solutions to the problems of a dissipative viscoelastic and elastic plastic contacts between curvilinear surfaces of two solid bodies can be found The novelty is that the forces of viscosity and the forces of elasticity can be found by an integration of the differential specific forces acting inside an elementary volume of the contact zone This volume shows that this method allows finding the viscoelastic forces for any theoretical or experimental dependencies between the distance of mutual approach of two curvilinear surfaces and the radiuses of the contact area Also the derivation of the integral equations of the viscoelastic forces has been given and the equations for the contact pressure have been obtained The viscoelastic and elastic plastic contacts at impact between two spherical bodies have been examined The equations for work and energy in the phases of compression and restitution and at the rolling shear have been obtained Approximate solutions for the differential equations of movement displacement by using the method of equivalent work have been calculated This new method of differential specific viscoelastic forces allows us to find the equations for all viscoelastic forces It is principally different from other methods that use Hertz's theory the classical theory of elasticity and the tensor algebra This method will be useful in research of contact dynamics of any shape of contacting surfaces It also can be used for determination of the dynamic mechanical properties of materials and in the design of wear resistant elements and coverings for components of machines and equipment that are in harsh conditions where they

are subjected to the action of flow or jet abrasive particles This volume will be useful for professional designers of machines and mechanisms as well as for the design and development of new advanced materials such as wear resistant elastic coatings and elements for pneumatic and hydraulic systems stop valves fans centrifugal pumps injectors valves gate valves and in other installations

Analysis of Machine Elements Using SOLIDWORKS Simulation 2017 Shahin Nudehi, John Steffen, 2017-04-25

Analysis of Machine Elements Using SOLIDWORKS Simulation 2017 is written primarily for first time SOLIDWORKS Simulation 2017 users who wish to understand finite element analysis capabilities applicable to stress analysis of mechanical elements The focus of examples is on problems commonly found in an introductory undergraduate Design of Machine Elements or similarly named courses In order to be compatible with most machine design textbooks this text begins with problems that can be solved with a basic understanding of mechanics of materials Problem types quickly migrate to include states of stress found in more specialized situations common to a design of mechanical elements course Paralleling this progression of problem types each chapter introduces new software concepts and capabilities Many examples are accompanied by problem solutions based on use of classical equations for stress determination Unlike many step by step user guides that only list a succession of steps which if followed correctly lead to successful solution of a problem this text attempts to provide insight into why each step is performed This approach amplifies two fundamental tenets of this text The first is that a better understanding of course topics related to stress determination is realized when classical methods and finite element solutions are considered together The second tenet is that finite element solutions should always be verified by checking whether by classical stress equations or experimentation Each chapter begins with a list of learning objectives related to specific capabilities of the SOLIDWORKS Simulation program introduced in that chapter Most software capabilities are repeated in subsequent examples so that users gain familiarity with their purpose and are capable of using them in future problems All end of chapter problems are accompanied by evaluation check sheets to facilitate grading assignments

Analysis of Machine Elements Using SOLIDWORKS Simulation 2022 Shahin S. Nudehi, John R. Steffen, 2022

Analysis of Machine Elements Using SOLIDWORKS Simulation 2022 is written primarily for first time SOLIDWORKS Simulation 2022 users who wish to understand finite element analysis capabilities applicable to stress analysis of mechanical elements The focus of examples is on problems commonly found in introductory undergraduate Design of Machine Elements or similarly named courses In order to be compatible with most machine design textbooks this text begins with problems that can be solved with a basic understanding of mechanics of materials Problem types quickly migrate to include states of stress found in more specialized situations common to a design of mechanical elements course Paralleling this progression of problem types each chapter introduces new software concepts and capabilities Many examples are accompanied by problem solutions based on use of classical equations for stress determination Unlike many step by step user guides that only list a succession of steps which if followed correctly lead to successful solution of a problem this text attempts to provide insight

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Analysis of Machine Elements Using Solidworks Simulation 2013 John Steffen,2013 Analysis of Machine Elements Using SolidWorks Simulation 2013 is written primarily for first time SolidWorks Simulation 2013 users who wish to understand finite element analysis capabilities applicable to stress analysis of mechanical elements The focus of examples is on problems commonly found in an introductory undergraduate Design of Machine Elements or similarly named courses In order to be compatible with most machine design textbooks this text begins with problems that can be solved with a basic understanding of mechanics of materials Problem types quickly migrate to include states of stress found in more specialized situations common to a design of mechanical elements course Paralleling this progression of problem types each chapter introduces new software concepts and capabilities Many examples are accompanied by problem solutions based on use of classical equations for stress determination Unlike many step by step user guides that only list a succession of steps which if followed correctly lead to successful solution of a problem this text attempts to provide insight into why each step is performed This approach amplifies two fundamental tents of this text The first is that a better understanding of course topics related to stress determination is realized when classical methods and finite element solutions are considered together The second tenet is that finite element solutions should always be verified by checking whether by classical stress equations or experimentation Each chapter begins with a list of learning objectives related to specific capabilities of the SolidWorks Simulation program introduced in that chapter Most software capabilities are repeated in subsequent examples so that users gain familiarity with their purpose and are capable of using them in future problems All end of chapter problems are accompanied by evaluation check sheets to facilitate grading assignments

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Analysis of Machine Elements Using SOLIDWORKS Simulation 2024 Shahin S. Nudahi, John R. Steffen, 2024 Designed for first time SOLIDWORKS Simulation users Focuses on examples commonly found in Design of Machine Elements courses Many problems are accompanied by solutions using classical equations Combines step by step tutorials with detailed explanations of why each step is taken Analysis of Machine Elements Using SOLIDWORKS Simulation 2024 is written primarily for first time SOLIDWORKS Simulation 2024 users who wish to understand finite element analysis capabilities applicable to stress analysis of mechanical elements The focus of examples is on problems commonly found in introductory undergraduate Design of Machine Elements or similarly named courses In order to be compatible with most machine design textbooks this text begins with problems that can be solved with a basic understanding of mechanics of materials Problem types quickly migrate to include states of stress found in more specialized situations common to a design of mechanical elements course Paralleling this progression of problem types each chapter introduces new software concepts and capabilities Many examples are accompanied by problem solutions based on use of classical equations for stress determination Unlike many step by step user guides that only list a succession of steps which if followed correctly lead to successful solution of a problem this text attempts to provide insight into why each step is performed This approach amplifies two fundamental tenets of this text The first is that a better understanding of course topics related to stress determination is realized when classical methods and finite element solutions are considered together The second tenet is that finite element solutions should always be verified by checking whether by classical stress equations or experimentation Each chapter begins with a list of learning objectives related to specific capabilities of the SOLIDWORKS Simulation program introduced in that chapter Most software capabilities are repeated in subsequent examples so that users gain familiarity with their purpose and are capable of using them in future problems All end of chapter problems are accompanied by evaluation check sheets to facilitate grading assignments

Analysis of Machine Elements Using

SOLIDWORKS Simulation 2015 Shahin Nudehi, John Steffen, 2015-04 Analysis of Machine Elements Using SOLIDWORKS Simulation 2015 is written primarily for first time SOLIDWORKS Simulation 2015 users who wish to understand finite element analysis capabilities applicable to stress analysis of mechanical elements The focus of examples is on problems commonly found in an introductory undergraduate Design of Machine Elements or similarly named courses In order to be compatible with most machine design textbooks this text begins with problems that can be solved with a basic understanding of mechanics of materials Problem types quickly migrate to include states of stress found in more specialized situations common to a design of mechanical elements course Paralleling this progression of problem types each chapter introduces new software concepts and capabilities Many examples are accompanied by problem solutions based on use of classical equations for stress determination Unlike many step by step user guides that only list a succession of steps which if followed correctly lead to successful solution of a problem this text attempts to provide insight into why each step is performed This approach amplifies two fundamental tenets of this text The first is that a better understanding of course topics related to stress determination is realized when classical methods and finite element solutions are considered together The second tenet is that finite element solutions should always be verified by checking whether by classical stress equations or experimentation Each chapter begins with a list of learning objectives related to specific capabilities of the SolidWorks Simulation program introduced in that chapter Most software capabilities are repeated in subsequent examples so that users gain familiarity with their purpose and are capable of using them in future problems All end of chapter problems are accompanied by evaluation check sheets to facilitate grading assignments

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Analysis of Machine Elements Using SOLIDWORKS Simulation 2020 Shahin Nudahi, John Steffen, 2020-06-16

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The book delves into Shigley Mechanical Engineering Design 9th Edition Solutions. Shigley Mechanical Engineering Design 9th Edition Solutions is an essential topic that must be grasped by everyone, from students and scholars to the general public. The book will furnish comprehensive and in-depth insights into Shigley Mechanical Engineering Design 9th Edition Solutions, encompassing both the fundamentals and more intricate discussions.

1. This book is structured into several chapters, namely:
 - Chapter 1: Introduction to Shigley Mechanical Engineering Design 9th Edition Solutions
 - Chapter 2: Essential Elements of Shigley Mechanical Engineering Design 9th Edition Solutions
 - Chapter 3: Shigley Mechanical Engineering Design 9th Edition Solutions in Everyday Life
 - Chapter 4: Shigley Mechanical Engineering Design 9th Edition Solutions in Specific Contexts
 - Chapter 5: Conclusion
 2. In chapter 1, this book will provide an overview of Shigley Mechanical Engineering Design 9th Edition Solutions. This chapter will explore what Shigley Mechanical Engineering Design 9th Edition Solutions is, why Shigley Mechanical Engineering Design 9th Edition Solutions is vital, and how to effectively learn about Shigley Mechanical Engineering Design 9th Edition Solutions.
 3. In chapter 2, this book will delve into the foundational concepts of Shigley Mechanical Engineering Design 9th Edition Solutions. This chapter will elucidate the essential principles that must be understood to grasp Shigley Mechanical Engineering Design 9th Edition Solutions in its entirety.
 4. In chapter 3, the author will examine the practical applications of Shigley Mechanical Engineering Design 9th Edition Solutions in daily life. The third chapter will showcase real-world examples of how Shigley Mechanical Engineering Design 9th Edition Solutions can be effectively utilized in everyday scenarios.
 5. In chapter 4, the author will scrutinize the relevance of Shigley Mechanical Engineering Design 9th Edition Solutions in specific contexts. The fourth chapter will explore how Shigley Mechanical Engineering Design 9th Edition Solutions is applied in specialized fields, such as education, business, and technology.
 6. In chapter 5, the author will draw a conclusion about Shigley Mechanical Engineering Design 9th Edition Solutions. The final chapter will summarize the key points that have been discussed throughout the book.
- The book is crafted in an easy-to-understand language and is complemented by engaging illustrations. It is highly recommended for anyone seeking to gain a comprehensive understanding of Shigley Mechanical Engineering Design 9th Edition Solutions.

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Table of Contents Shigley Mechanical Engineering Design 9th Edition Solutions

1. Understanding the eBook Shigley Mechanical Engineering Design 9th Edition Solutions
 - The Rise of Digital Reading Shigley Mechanical Engineering Design 9th Edition Solutions
 - Advantages of eBooks Over Traditional Books
2. Identifying Shigley Mechanical Engineering Design 9th Edition Solutions
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Shigley Mechanical Engineering Design 9th Edition Solutions
 - User-Friendly Interface
4. Exploring eBook Recommendations from Shigley Mechanical Engineering Design 9th Edition Solutions
 - Personalized Recommendations
 - Shigley Mechanical Engineering Design 9th Edition Solutions User Reviews and Ratings
 - Shigley Mechanical Engineering Design 9th Edition Solutions and Bestseller Lists
5. Accessing Shigley Mechanical Engineering Design 9th Edition Solutions Free and Paid eBooks
 - Shigley Mechanical Engineering Design 9th Edition Solutions Public Domain eBooks
 - Shigley Mechanical Engineering Design 9th Edition Solutions eBook Subscription Services
 - Shigley Mechanical Engineering Design 9th Edition Solutions Budget-Friendly Options
6. Navigating Shigley Mechanical Engineering Design 9th Edition Solutions eBook Formats
 - ePub, PDF, MOBI, and More
 - Shigley Mechanical Engineering Design 9th Edition Solutions Compatibility with Devices
 - Shigley Mechanical Engineering Design 9th Edition Solutions Enhanced eBook Features

7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Shigley Mechanical Engineering Design 9th Edition Solutions
 - Highlighting and Note-Taking Shigley Mechanical Engineering Design 9th Edition Solutions
 - Interactive Elements Shigley Mechanical Engineering Design 9th Edition Solutions
8. Staying Engaged with Shigley Mechanical Engineering Design 9th Edition Solutions
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Shigley Mechanical Engineering Design 9th Edition Solutions
9. Balancing eBooks and Physical Books Shigley Mechanical Engineering Design 9th Edition Solutions
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Shigley Mechanical Engineering Design 9th Edition Solutions
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Shigley Mechanical Engineering Design 9th Edition Solutions
 - Setting Reading Goals Shigley Mechanical Engineering Design 9th Edition Solutions
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Shigley Mechanical Engineering Design 9th Edition Solutions
 - Fact-Checking eBook Content of Shigley Mechanical Engineering Design 9th Edition Solutions
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
 - Integration of Multimedia Elements
 - Interactive and Gamified eBooks

Shigley Mechanical Engineering Design 9th Edition Solutions Introduction

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