

SOLUTION MANUAL

CONTEMPORARY ENGINEERING

ECONOMICS 5TH EDITION

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Solution Manual for Contemporary Engineering Economics, 5th Edition

Question 1: A project has an initial investment of \$100,000 and is expected to generate annual cash flows of \$20,000 for the next 5 years. What is the project's net present value (NPV) at a discount rate of 10%?

Answer: Using the formula for NPV, we get $NPV = -100,000 + 20,000/(1+0.1)^1 + 20,000/(1+0.1)^2 + 20,000/(1+0.1)^3 + 20,000/(1+0.1)^4 + 20,000/(1+0.1)^5 = \$48,279$.

Question 2: A company is considering investing in a new machine that will cost \$50,000. The machine is expected to increase annual revenue by \$15,000 and reduce annual expenses by \$5,000. The machine has a life of 10 years and a salvage value of \$5,000. What is the project's internal rate of return (IRR)?

Answer: Setting the NPV formula equal to zero and solving for the discount rate that makes it true, we get $IRR = 13.02\%$.

Question 3: A project has an investment of \$100,000 and is expected to generate annual cash flows of \$25,000 for the next 10 years. The project also has a salvage value of \$20,000 at the end of its life. What is the project's payback period?

Answer: Payback period = 5 years.

Question 4: A company is considering two mutually exclusive projects. The first project has an annual cash flow of \$10,000 for the next 5 years, while the second project has an annual cash flow of \$6,000 for the next 10 years. Both projects require an initial investment of \$50,000. At a discount rate of 8%, which project has the better NPV?

Answer: Project 1 has an NPV of \$20,358, while Project 2 has an NPV of \$40,665. Therefore, Project 2 has the better NPV.

Question 5: A project has an investment of \$100,000 and is expected to generate a perpetual cash flow of \$10,000 per year. What is the project's equivalent annual worth (EAW) at a discount rate of 6%?

Answer: $EAW = 10,000 / (1 - 0.06) = \$106,383$.

Solved Problems in Geostatistics

Geostatistics is a powerful tool for analyzing spatial data. It uses statistical methods to describe and predict the spatial distribution of variables. Solved problems are a valuable resource for learning how to use geostatistics and for troubleshooting.

Question: How do I choose the right variogram model?

Answer: The choice of variogram model depends on the data and the purpose of the analysis. There are several common variogram models, including the spherical, exponential, and Gaussian models. The spherical model is a good choice when the data is isotropic (i.e., the spatial correlation is the same in all directions). The exponential model is a good choice when the data is anisotropic (i.e., the spatial correlation is different in different directions). The Gaussian model is a good choice when the data is normally distributed.

Question: How do I kriging with a variogram model?

Answer: Kriging is a geostatistical method for predicting values at unsampled locations. It uses a variogram model to describe the spatial correlation between data points. The kriging equations can be used to predict values at any location within the study area.

Question: How do I validate a geostatistical model?

Answer: Validation is an important step in any geostatistical analysis. It ensures that the model is accurate and reliable. There are several ways to validate a geostatistical model, including cross-validation and residual analysis. Cross-validation involves predicting values at unsampled locations and comparing them to the actual values. Residual analysis involves examining the differences between the predicted values and the actual values.

Question: How do I use geostatistics to solve real-world problems?

Answer: Geostatistics can be used to solve a wide variety of real-world problems, including environmental monitoring, natural resource management, and precision agriculture. For example, geostatistics can be used to predict the concentration of pollutants in groundwater, the abundance of wildlife species in a forest, or the yield of crops in a field.

Question: Where can I find more solved problems in geostatistics?

Answer: There are many resources available for finding solved problems in geostatistics. Some popular resources include:

- [Geostatistics for Environmental Scientists](#) by Michael Lark
- [Geostatistics in Petroleum Geology](#) by Alain Gringarten and Deborah Deutsch
- [Geostatistics for GIS and GPS](#) by Barry Kidwell

The Mechanics and Thermodynamics of Continuous Media: Unraveling the Dynamics of Matter

Q: What is the premise of "The Mechanics and Thermodynamics of Continuous Media, 1st Edition"?

A: This seminal work elucidates the behavior of continuous media, such as fluids and solids, through the principles of mechanics and thermodynamics. It provides a comprehensive framework for understanding the fundamental laws governing the motion and deformation of matter.

Q: How does the book expound on the mechanics of continuous media?

A: The book delves into the concepts of stress, strain, and constitutive equations, exploring the relationship between the forces acting on a body and the resulting deformations. It covers topics such as linear and nonlinear elasticity, viscoelasticity, and plasticity.

Q: What role does thermodynamics play in the analysis of continuous media?

A: Thermodynamics establishes the connection between the mechanical and thermal behavior of materials. The book examines the principles of energy conservation, entropy, and the Gibbs free energy. It demonstrates how these concepts can be applied to study phase transformations, chemical reactions, and transport phenomena.

Q: What are the applications of this framework?

A: The mechanics and thermodynamics of continuous media find widespread applications in various fields, including engineering, materials science, geology, and biomechanics. It aids in the design and analysis of structures, the development of new materials, the study of geological processes, and the modeling of biological systems.

Q: Is this book suitable for students and practitioners alike?

A: Yes, "The Mechanics and Thermodynamics of Continuous Media, 1st Edition" is written in a clear and accessible style, making it suitable for both students and experienced practitioners. It provides a comprehensive overview of the subject matter, supported by numerous examples and illustrations.

Tina Turner's Incredible Journey: A Q&A Story

Q: Tell us about Tina Turner's early life.

A: Tina Turner (born Anna Mae Bullock) was born in Brownsville, Tennessee, in 1939. She grew up in a poor family and began singing in church at an early age. At the age of 17, she met Ike Turner, who became her husband and musical partner.

Q: How did Tina Turner achieve success in the music industry?

A: Tina Turner and Ike Turner formed the Ike & Tina Turner Revue in 1960. They had a string of hit singles, including "Proud Mary" and "Nutbush City Limits." Tina Turner's powerful voice and energetic performances made her an iconic figure in the music industry. However, she endured physical and emotional abuse from her husband, and she eventually filed for divorce in 1976.

Q: What happened to Tina Turner's career after her divorce from Ike Turner?

A: After divorcing Ike Turner, Tina Turner embarked on a successful solo career. She released her debut album, "Tina Turns the Country On!" in 1974. Her breakthrough came in 1984 with her album "Private Dancer," which sold over 20 million copies worldwide. Tina Turner's subsequent albums, such as "Break Every Rule" and "Foreign Affair," further solidified her status as a global superstar.

Q: What are some of Tina Turner's most famous songs?

A: Some of Tina Turner's most famous songs include "What's Love Got to Do with It," "Proud Mary," "Private Dancer," "The Best," "Break Every Rule," and "Nutbush City Limits." Her songs have been featured in numerous films, television shows, and commercials.

Q: What is Tina Turner's legacy?

A: Tina Turner is widely regarded as one of the greatest singers of all time. She has won eight Grammy Awards, including a Grammy Lifetime Achievement Award. She is also a Rock and Roll Hall of Famer and has been inducted into the Black Music & Entertainment Walk of Fame. Tina Turner's music continues to inspire and empower people worldwide.

[*solved problems in geostatistics, the mechanics and thermodynamics of continuous media 1st edition, tina turner story*](#)

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