Data Analysis Boot Camp Training

Duration: **3 Day**

BILGINÇ IT Academy
info@bilginc.com
bilginc.com

Overview

Build practical data analysis skills using Excel and the R programming language.

The Data Analysis Boot Camp is a three-day, hands-on training program designed for professionals who want to evaluate data more effectively, assess data quality, and make better-informed business decisions through analytical techniques.

Using practical examples drawn from business environments, this course introduces essential data analysis processes, statistical methods, and data management practices. Participants learn how to explore, analyze, and interpret information using Excel functions and the R programming language.

The training begins with core concepts in data quality and management before progressing to statistical analysis, data visualization, predictive analytics, and modeling techniques. It also emphasizes communicating analytical findings clearly to stakeholders and using data-driven insights to support timely organizational decisions.

Practical Exercises, Live Demonstrations, and Real-World Business Scenarios

The Data Analysis Boot Camp combines instructor-led learning with practical activities that allow participants to apply analytical concepts as they develop their skills.

Through live demonstrations, guided laboratory exercises, and business-focused case studies, participants gain experience working with real-world analytical challenges.

Practical activities cover data cleansing, statistical calculations, chart creation, regression analysis, clustering, and Monte Carlo simulation. By working with Excel and R, participants develop skills they can apply to analytical tasks in their professional environments.

Upon completing the course, participants will be better equipped to extract meaningful information from data, interpret analytical results, and communicate findings in ways that support business decisions.

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Who Should Attend

This training is intended for professionals who work with business data, evaluate analytical findings, or contribute to data-driven decision-making.

- Business Analysts, Business Systems Analysts, and CBAP or CCBA professionals
- Systems Analysts, Operations Research Analysts, Marketing Analysts, and other analytical professionals
- Project Managers, Program Managers, Team Leaders, and PMP or CAPM professionals
- Data Modelers, Data Administrators, and Database Administrators (DBAs)
- IT Managers, Directors, and senior IT leaders
- Finance Managers, Directors, and financial decision-makers
- Operations Supervisors, Managers, and Directors
- Risk Managers and Operational Risk Professionals
- Process Improvement Specialists, Auditors, Internal Consultants, and related staff
- Executives evaluating opportunities for cost reduction and process improvement
- Job seekers and professionals looking to develop data analysis capabilities
- Senior employees responsible for providing recommendations or decision support to executives

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What You Will Learn

By completing this training, participants will gain knowledge and practical experience in the following areas:

- Identify organizational improvement opportunities, manage change, and develop greater visibility into business operations through data
- Understand the fundamental terminology and concepts used in data analytics, business intelligence, and statistics
- Explore practical applications of data analysis methods across different business scenarios
- Present data and analytical findings through clear graphical visualizations that stakeholders can understand
- Develop more reliable estimates by considering variance, error, and confidence intervals
- Create and interpret charts that help uncover trends, relationships, and patterns within datasets
- Distinguish meaningful signals from random variation and noise in data
- Understand different statistical distribution models and their applications in real-world situations
- Formulate and test hypotheses while applying different methods to interpret predictions
- Apply statistical inference to draw conclusions about populations based on sample data

Outline

Part 1: Data Fundamentals

1. Course Introduction and Foundational Review

- Course objectives
- Participant expectations and assessment of starting knowledge

2. Understanding Data in Real-World Environments

- Structured and unstructured data
- Relationships between data elements
- Outliers
- Growth in data volume

3. Types of Data

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- Different data types and their characteristics
- Sources of data
- Internal and external data sources
- Time perspectives: lagging, current, and leading indicators

4. Lab: Getting Started with the Training Dataset

5. Data-Related Risks

- Common data risks
- How processes influence analytical results
- The impact of data usage on outcomes
- Opportunity costs and investments in analytical tools
- Risk mitigation approaches

6. Data Quality

- Data cleansing
- Identifying duplicate records
- Single Source of Truth (SSOT)
- Standardizing data fields
- Detecting missing or sparsely populated fields
- Resolving common data quality problems

7. Lab: Practical Data Quality Exercises

Part 2: Analysis Foundations

1. Introduction to Statistical Practices

- Comparing data analysis tools and software
- Differences between everyday language and data terminology
- Fundamental concepts specific to data analysis
- Different domains of data analysis
- Descriptive statistics

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- Inferential statistics
- Developing an analytical mindset
- Defining problems and identifying analytical solutions

Part 3: Analyzing Data

1. Averages and Basic Statistical Measures

- Mean
- Median
- Mode
- Range

2. Central Tendency and Measures of Dispersion

- Variance
- Standard deviation
- Sigma values
- Percentiles
- Applying statistical measures to estimation

3. Lab: Hands-On Analysis of Central Tendency and Dispersion

4. Graphical Techniques for Data Analysis

5. Visualizing Categorical Data

- Bar charts

6. Visualizing Continuous Data

- Histograms

7. Visualizing Time Series Data

- Line charts

8. Analyzing Bivariate Data

- Scatter plots

9. Visualizing Data Distributions

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- Box plots

Part 4: Analytics & Modeling

1. Common Statistical Distributions and Analytical Techniques

- Probability distributions
- Cumulative distributions
- Bimodal distributions
- Skewness in data
- Pareto distribution
- Correlation
- Lab: Working with distributions
- Predictive analytics
- Exploring patterns in data
- Regression and time series analysis for prediction
- Lab: Hands-on linear regression
- Simulation techniques
- Pseudo-random sequences
- Monte Carlo analysis
- Demo/Lab: Monte Carlo simulation using Excel

2. Understanding Clustering

3. Data Segmentation

4. Common Clustering Algorithms

5. K-Means Clustering Algorithm

Part 5: Hands-On Introduction to R and RStudio

1. Fundamentals of the R Programming Language

2. Descriptive Statistics with R

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3. Importing and Manipulating Data

4. Writing Scripts in R

5. Data Visualization Using R

6. Regression Analysis in R

7. K-Means Clustering in R

8. Monte Carlo Analysis in R

9. Demo/Lab: Practical Data Analysis Exercises with R

Part 6: Visualizing & Presenting Data

1. Objectives of Data Visualization

- Communicating insights and building data narratives
- Supporting decision-making processes
- Essential characteristics of effective visualization

2. Fundamentals of Data Visualization

- Understanding users and stakeholders
- A practical guide to stakeholder requirements
- Common visualization mistakes

3. Communicating Data-Driven Knowledge

- Sharing alerts and trends
- Evaluating self-service analysis and reporting
- Presentation formats and tools
- Key design considerations