Data Science Course

Code In Tips Certified Advanced Programming Professional and Master Data Science Course.

- Interactive Lessons
- Comprehensive Resources
- Flexible Learning
- Proficiency Assessments

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Introduction:

CodeInTips is a premier edutech company committed to delivering industry-aligned trainingto students andworkingprofessionals, empowering themwith the latest skills required toexcelin today'srapidly evolving IT landscape. Our cutting-edge training programs aremeticulously designed to bridge the gap between academic learning and real-world industry demands, covering the most sought-after technologies, emerging innovations, and hands-on project experience.

Mission

At Code In Tips, our mission is to empower aspiring IT professionals by providing innovative, high-quality education that aligns with the rapidly changing demands of the tech industry. We aim to deliver practical, industry-relevant training that not only enhances technical expertise but also fosters critical thinking, problem-solving, and career readiness. Through expert mentorship, real-world projects, and personalized guidance, we strive to equip our learners with the confidence and skills required to tackle complex challenges in the IT domain. Our commitment lies in offering flexible, accessible learning solutions with ongoing support to help individuals unlock their potential and build successful careers in technology. We believe in fostering a culture of continuous learning and innovation, ensuring our students remain competitive and future-ready in the dynamic digital landscape.

Vision

Our vision is to become the most trusted and sought-after online learning platform, recognized for transforming careers and shaping the future of IT professionals worldwide. We aspire to create a global learning ecosystem where individuals, regardless of their background, have access to the latest technologies and career opportunities. By continuously evolving our curriculum and collaborating with industry experts, we aim to bridge the gap between academia and industry, driving meaningful impact in the professional journeys of our learners. Through technological innovation, world-class mentorship, and a learner-centric approach, we envision becoming a catalyst for empowering professionals to achieve excellence, inspire innovation, and contribute to the advancement of the IT industry on a global scale.

Data Science Course

Weekdays/Weekend LIVE Classes

↓

Hands-on Industry Projects

↓

Technical Mentorship by Industry Experts

↓

Practise on Coding Practise Platforms

↓

Live Cumulative test & Mock Interviews

↓

Get Placement Guidance

Top skills you'll learn!

- Best Statistical programming language skills with Python.
- Excellent database querying skills.
- Good understanding of Analytical tools & Statistics.
- Conceptual clarity towards Predictive performance & algorithm optimization.
- Master data visualization & communication skills

Self-paced Courses - Add on

Technologies Covered

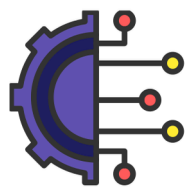
Tableau

Power BI

Python

Machine Learning

Data Science



Computational Thinking

Why Codeintips Data Science Program?

Program Curriculum

Thisweekyou willgo through the basicsofcompetitive programmingand data science as well aswellwewillcome across the current industry trends in Data Science

- Introduction to Programming
- What is Data Science and what is Machine Learning?
- Competitive programming with Python (Codekata)
- Experts talk on industry trends
- Main Bootcamp flow

Module-1

1. ExcelBasics

Introduction to Excel Environment

- Navigate through the Excel interface, including ribbons, toolbars, and workbooks.
- Understanding cell references: absolute, relative, and mixed references.

Efficient Worksheet Management

- Creating, renaming, and formatting worksheets.
- Grouping, freezing panes, and using shortcuts for navigation.

2. Core Excel Formulas and Functions

Basic Functions

- Navigate through the Excel interface, including ribbons, toolbars, and workbooks.
- Understanding cell references: absolute, relative, and mixed references.

Logical Functions

- Implement decision-making functions such as IF, AND, OR, and NOT.
- Crafting nested IF statements for complex conditions.

Date and Time Functions

- Automating date-based calculations with TODAY, NOW, DATE, YEAR, MONTH, and DAY.
- Analyzing work durations with NETWORKDAYS and WORKDAY functions.

Text Functions

- Manipulate text data using CONCAT, TEXTJOIN, LEFT, RIGHT, MID, LEN, TRIM, and PROPER.
- Formatting and extracting meaningful data from unstructured text.

Text Functions

- Implement advanced search techniques with VLOOKUP, HLOOKUP, XLOOKUP, INDEX, and MATCH.
- Dynamic range lookups for data modeling and reconciliation.

3. Data Visualization and Reporting

PivotTables and PivotCharts

- Learn to create dynamic reports for summarizing large datasets

Charting

- Master visualizations like bar charts, line graphs, and scatter plots.

Conditional Formatting

- Highlight data patterns with heatmaps and data bars.

4. Advanced Excel Techniques for MIS

What-If Analysis

- Use Goal Seek, Data Tables, and Scenario Manager to analyze hypothetical business scenarios.

Data Consolidation

- Aggregate and merge data from multiple workbooks and sheets.

Forecasting and Trend Analysis

- Automate trend identification with Forecast Sheets and TREND functions.

5. Automation and Macros

Introduction to Macros

- Record and execute simple macros for repetitive tasks.

6. Project

HR Analytics

- Using an interactive dashboard, find out the possible key factors influencing Attrition.

Super Store Daily Reporting

- Create a Dashboard to observe sales and profit on a daily , weekly, and monthly basis

Module-2

1. Getting Started with Power BI

Overview of Power BI ecosystem

- Understanding Power BI Desktop, Service, and Mobile applications.
- Connecting to diverse data sources: Excel, SQL Server, and APIs.

2. Data Transformation in Power Query

Cleaning and transforming datasets

- Removing duplicates, splitting columns, and merging tables.
- Handling missing data and reshaping datasets.

Understanding M-code

- Basics of M-code for advanced transformations.

3. Data Modeling

Establishing relationships

- Understanding one-to-one and one-to-many relationships.
- Implementing star schema for analytical efficiency.

Optimizing models

- Setting up calculated columns and measures.

4. Data Visualization in Power BI

Creating impactful visuals

- Using bar, pie, line, and scatter plots for effective communication.
- Designing custom visuals with Power BI Marketplace

Interactivity features

- Implementing slicers, drill-throughs, and report filters.

5. Introduction to DAX (Data Analysis Expressions)

Basic DAX measures

- Using SUM, COUNT, and AVERAGE for aggregations.

Logical functions in DAX

- Applying IF, SWITCH, and conditional calculations.

Time intelligence

- Performing YTD, MTD, and QTD analysis.

6. Publishing and Collaboration

Publishing reports to Power BI Service

- Sharing dashboards and managing permissions.

Collaboration features

- Setting up workspaces and embedding reports.

6. Publishing and Collaboration

- Row-Level Security (RLS)
  - Implementing RLS for data access control.
- Power BI and Python/R integration
  - Enhancing analytics with Python scripts.

Module-3

1. Introduction to Tableau

- Overview of Tableau
- What is Tableau?
- Importance of Tableau for Data Analysts
- Tableau Product Suite: Tableau Desktop, Tableau Public, Tableau Online, Tableau Server
- Getting Started with Tableau
- Installing Tableau Desktop or Tableau Public
- Understanding Tableau Interface
- Connecting to Data Sources (Excel, CSV, SQL, etc.)

2. Data Preparation and Connections

- Connecting to Data
- Connecting to different file types (Excel, CSV, SQL databases, etc.)
- Live vs. Extract Connections

- Data Preparation Data Cleaning and
- Transformation in Tableau Prep Joins, Blends, and
- Relationships Pivoting and Splitting Columns
- Understanding Metadata
- Data Types and Roles
- Managing Hierarchies
- Creating Calculated Fields and Sets
-

3. Building Basic Visualizations

- Introduction to Charts
- Bar Charts
- Line Charts
- Pie Charts
- Tables and Text Visuals
- Cross-tabs
- Highlight Tables
- Heat Maps
- Using Filters and Sorting
- Dimension and Measure Filters
- Interactive Filters
- Sorting and Grouping

4. Advanced Visualizations

- Advanced Chart Types
- Dual-Axis Charts
- Tree Maps
- Bubble Charts
- Waterfall Charts
- Gantt Charts
- Geographical Analysis
- Maps and Spatial Analysis
- Using Map Layers
- Dashboards and Stories
- Building Interactive Dashboards
- Adding Filters and Actions
- Creating Stories for Presentations

5. Advanced Analytics

- Calculated Fields and Table Calculations
- String, Date, and Logical Functions
- Aggregate and Level of Detail (LOD) Expressions
- Forecasting and Trend Analysis
- Adding Trend Lines
- Forecasting
- Creating and Using Parameters
- Dynamic Filtering and Highlighting

6. Collaboration and Sharing

- Publishing and Sharing
- Publishing to Tableau Server or Tableau Online
- Sharing Workbooks and Dashboards

7. Case Studies and Projects

- Industry-Specific Projects
- Sales and Marketing Dashboards

Module-4

1. Introduction to SQL

- Introduction to SQL
- What is SQL?
- SQL vs NoSQL
- SQL Syntax and Standards
- Installing MySQL and MySQL Workbench
- MySQL Workbench Overview
- Database Basics
- Database vs Table
- Keys: Primary Key, Foreign Key, Unique Key

2. Data Definition Language (DDL)

- Creating Databases and Tables
- CREATE DATABASE Syntax
- CREATE TABLE Syntax with Examples
- Data Types in MySQL (Numeric, String, Date/Time)
- Altering Databases and Tables
- ALTER TABLE: Adding, Modifying, and Dropping Columns
- Renaming Tables
- Dropping Databases and Tables
- DROP DATABASE
- DROP TABLE
- Constraints
- Primary Key, Foreign Key
- NOT NULL, UNIQUE, CHECK, DEFAULT

3. Data Manipulation Language (DML)

- Inserting Data
- INSERT INTO Syntax
- Bulk Inserts
- Retrieving Data
- SELECT Statement
- Filtering Data with WHERE
- Sorting with ORDER BY
- Pagination with LIMIT
- Updating Data
- UPDATE Syntax
- Updating with Conditions
- Deleting Data
- DELETE Syntax
- Truncate Table (TRUNCATE)

4. Data Control Language (DCL)

- User Management Creating Users:
- CREATE USER Modifying Users:
- ALTER USER Deleting Users: DROP
- USER Granting and Revoking
- Permissions GRANT: Assigning
- Privileges REVOKE: Removing
- Privileges Viewing Privileges:
- SHOW GRANTS Role Management
- Creating and Assigning Roles
- Managing Role Privileges
-

5. Advanced Queries

- Joins
- Inner Join
- Left (Outer) Join
- Right (Outer) Join
- Full (Outer) Join (using UNION)
- Cross Join
- Self Join
- Subqueries
- Single-Row Subqueries
- Multi-Row Subqueries
- Correlated Subqueries
- Aggregate Functions
- SUM, COUNT, AVG, MIN, MAX
- Grouping with GROUP BY
- Filtering Groups with HAVING
- Set Operations
- UNION, UNION ALL
- INTERSECT (Emulated in MySQL)
- EXCEPT (Emulated in MySQL)

6. Views

- Introduction to Views
- What are Views?
- Advantages and Limitations
- Creating Views
- CREATE VIEW Syntax
- Views with Joins
- Modifying and Dropping Views
- ALTER VIEW
- DROP VIEW

7. Stored Procedures

- Introduction to Stored Procedures
- Benefits of Stored Procedures
- Use Cases
- Creating Stored Procedures
- CREATE PROCEDURE Syntax
- IN, OUT, and INOUT Parameters
- Executing Stored Procedures
- Calling Procedures with CALL
- Passing Parameters
- Modifying and Dropping Procedures
- ALTER PROCEDURE
- DROP PROCEDURE

8 Functions

- Introduction to Functions
- Differences Between Functions and Procedures
- Use Cases
- Creating Functions
- CREATE FUNCTION Syntax
- Deterministic vs Non-Deterministic Functions
- Using Functions
- Calling Functions in Queries
- Example: String, Date, and Numeric Functions
- Modifying and Dropping Functions
- ALTER FUNCTION
- DROP FUNCTION

9 Triggers

- Introduction to Triggers
- What are Triggers?
- Use Cases
- Creating Triggers
- CREATE TRIGGER Syntax
- BEFORE and AFTER Triggers
- Triggers for INSERT, UPDATE, DELETE
- Managing Triggers
- Viewing Triggers: SHOW TRIGGERS
- Dropping Triggers: DROP TRIGGER

10 Performance Optimization

- Indexing
- What are Indexes?
- Types of Indexes: Primary, Unique, Full-Text
- Creating and Dropping Indexes
- Query Optimization
- Using EXPLAIN to Analyze Queries
- Common Query Optimization Techniques
- Database Normalization
- 1NF, 2NF, 3NF, and Beyond
- Denormalization for Performance
- Partitioning
- Horizontal and Vertical Partitioning
- Managing Partitions in MySQL
- Healthcare Analytics
- Supply Chain Dashboard

Module-5

1. Introduction to Python

- Overview of Python
  - Importance of Python in data and business analytics.
  - Installation and setup of Python and Jupyter Notebook.
- Python Basics
  - Syntax, indentation, and writing your first Python script.
  - Data types: integers, floats, strings, booleans.
  - Variables and type casting.

2. Data Structures in Python

- Lists
  - Creation, indexing, slicing, and common list operations.
  - List comprehensions for concise operations
- Tuples
  - Immutable sequences and use cases in analytics.
- Dictionaries
  - Key-value pairs for mapping and lookup operations.
  - Dictionary comprehensions and nested dictionaries.
- Sets
  - Unique elements, set operations (union, intersection, difference).

3. Conditional Statements and Loops

- Conditional Statements
  - if, elif, else: Handling decision-making scenarios.
  - Nested conditions for complex logic.
- Loops
  - for and while loops for repetitive tasks.
  - Using break, continue, and pass statements.
- Practical Examples
  - Iterating through datasets and extracting information.

4. Exception Handling

- Understanding Errors
  - SyntaxError, TypeError, ValueError, and their causes.
- Try-Except Blocks
  - Handling runtime errors gracefully.
  - Using finally for cleanup operations.
- Raising Exceptions
  - Custom error messages for debugging.

5. Functions and Modules

Functions

- Defining and calling functions with def.
- Using parameters, arguments, and return statements.

Lambda Functions

- Creating anonymous functions for one-time use.
- Use cases in data filtering and mapping.

Modules and Packages

- Importing built-in modules like math and random.
- Creating and using custom modules.

6. Object-Oriented Programming (OOP)

Classes and Objects

- Defining classes and creating objects.
- Attributes and methods.Nested conditions for complex logic.

OOP Principles

- Inheritance, polymorphism, encapsulation, and abstraction.
- Practical examples in analytics projects.

7. Data Manipulation with Numpy

Introduction to Numpy

- Arrays vs. lists: Benefits and performance.
- Creating arrays: zeros, ones, arange, and linspace.

Array Operations

- Element-wise operations, indexing, and slicing.
- Aggregations: sum, mean, std, and min/max.

Broadcasting and Reshaping

- Reshaping arrays for analytical tasks.
- Stacking and splitting arrays.

8. Data Analysis with Pandas

- Introduction to Pandas
  - Series and DataFrames: Creation and manipulation.
- Data Cleaning
  - Handling missing data with fillna, dropna.
  - Detecting and removing duplicates.
- Data Operations
  - Filtering, sorting, and grouping data.
  - Merging, joining, and concatenating DataFrames.
- Exploratory Data Analysis (EDA)
  - Descriptive statistics with Pandas: describe(), info().
  - Data visualization integration with Pandas.

9. Data Visualization

- Matplotlib
  - Creating basic plots: line, scatter, bar, and histogram.
  - Customizing plots: titles, labels, legends, and styles.
  - Subplots for comparative analysis.
- Seaborn
  - Advanced visualizations: heatmaps, pairplots, and boxplots.
  - Customizing aesthetics for professional reporting.
  - Statistical plots: regression plots, violin plots.
- Plotly
  - Interactive visualizations: line and scatter plots.
  - Building dashboards with Plotly Dash.
  - Enhancing business presentations with interactivity.

10. Exploratory Data Analysis (EDA)

- Understanding the Dataset
  - Overview of columns, data types, and null values.
  - Identifying outliers and inconsistencies.
- Univariate Analysis
  - Analyzing individual features with histograms and boxplots
- Bivariate and Multivariate Analysis
  - Correlation analysis and heatmaps.
  - Pairwise relationships using pairplots.
- Feature Engineering
  - Creating new features from existing ones.
  - Encoding categorical variables for modeling.

11. Statistical Analysis

- Descriptive Statistics
  - Measures of central tendency: mean, median, mode.
  - Measures of dispersion: variance, standard deviation, range.
- Probability Basics
  - Introduction to distributions: normal, binomial, and uniform.
  - Understanding probability density functions (PDFs).
- Hypothesis Testing
  - t-tests, chi-square tests, and ANOVA.
  - p-values and statistical significance.

11. Statistical Analysis

- Project 1: Sales Data Analysis
  - Analyzing regional sales performance.
  - Visualizing trends and seasonality.

Module-6

1. IntroductiontoMachineLearning

- What is Machine Learning?
- Definition and Applications
- Types of Machine Learning: Supervised, Unsupervised, Reinforcement Learning
- Machine Learning Workflow
- Data Collection and Preprocessing
- Model Training and Evaluation
- Model Deployment
- Tools and Libraries
- Python for Machine Learning
- Libraries: NumPy, pandas, scikit-learn, TensorFlow, PyTorch

2. Supervised Learning

- **Linear Regression**
- Concept of Line Fitting
- Equation of Linear Regression ($y = mx + c$)
- Implementation using scikit-learn
- Metrics: Mean Squared Error (MSE), R^2 Score
- Advanced Topics: Multiple Linear Regression, Polynomial Regression
- **Logistic Regression**
- Concept of Classification
- Logistic Regression Function (Sigmoid)
- Implementation: Binary and Multiclass Classification
- Metrics: Accuracy, Precision, Recall, F1 Score, ROC-AUC

- **Decision Tree**
- Tree Structure, Nodes, Splitting Criteria
- Implementation and Visualization using scikit-learn
- Advantages and Limitations
- **Naive Bayes**
- Bayes' Theorem and Assumption of Feature Independence
- Types: Gaussian, Multinomial, Bernoulli
- Use Cases: Text Classification (e.g., Spam Detection)
- **k-Nearest Neighbors (k-NN)**
- Concept of Distance Metrics (Euclidean, Manhattan)
- Performance Evaluation
- **Support Vector Machines (SVM)**
- Decision Boundary and Kernel Trick (Linear, Polynomial, RBF)
- Hyperparameter Tuning (C, Gamma)
- Applications: Image Classification, Text Categorization

3. Unsupervised Learning

- **Clustering**
- k-Means Clustering: Objective Function, Elbow Method
- Hierarchical Clustering: Agglomerative and Divisive Methods
- Density-Based Clustering: DBSCAN Algorithm
- **Dimensionality Reduction**
- Principal Component Analysis (PCA)
- t-Distributed Stochastic Neighbor Embedding (t-SNE)
- **Association Rule Learning**
- Apriori Algorithm: Finding Frequent Itemsets, Generating Association Rules
- Applications: Market Basket Analysis

4. Reinforcement Learning

- **Basics of Reinforcement Learning** Agent, Environment, Actions, Rewards Exploration vs. Exploitation **Markov Decision Process (MDP)**
- States, Actions, Transition Probabilities, Rewards
- **Algorithms**
- Q-Learning
- Deep Q-Learning
-

5. Ensemble Learning

- **Concept of Ensemble Methods**
- Bagging vs. Boosting
- **Bagging**
- Random Forest: Building and Tuning
- **Boosting**
- Gradient Boosting, AdaBoost, XGBoost
- **Stacking**
- Combining Multiple Algorithms, Meta-Learning

6. Model Evaluation and Optimization

- **Cross-Validation**
- k-Fold Cross-Validation
- Leave-One-Out Cross-Validation (LOOCV)
- **Hyperparameter Tuning**
- Grid Search, Random Search
- Feature Selection and Engineering
- Feature Importance, Feature Scaling
- **Handling Overfitting**
- Regularization (L1, L2), Dropout for Neural Networks

Module-7

1. IntroductiontoDeepLearning

- Introduction to Deep Learning
  - Definitions and scope
  - Real-world applications
- Introduction to Deep Learning
  - Differences between Machine Learning and Deep Learning
  - Key components of Deep Learning
  - Popular Deep Learning frameworks (TensorFlow, PyTorch)
- Mathematical Foundations
  - Linear algebra basics
  - Probability and statistics review
  - Introduction to calculus for optimization

2. Neural Networks Fundamentals

- Structure of a Neural Network
  - Neurons, layers, and activation functions
  - Forward and backward propagation
  - Loss functions
- Types of Neural Networks
  - Artificial Neural Networks (ANNs)
  - Recurrent Neural Networks (RNNs)
  - Convolutional Neural Networks (CNNs)
- Training Neural Networks
  - Gradient descent and optimization algorithms
  - Hyperparameter tuning

3. Deep Learning with TensorFlow and PyTorch

- Introduction to TensorFlow
  - Basic operations and tensors
  - Building and training a simple neural network
- Introduction to PyTorch
  - PyTorch tensors and operations
  - Training neural networks using PyTorch

4. Convolutional Neural Networks (CNNs)

- Understanding CNNs
  - Convolutions and pooling layers
  - Applications of CNNs in image processing
- Building CNN Models
  - Implementing CNNs using TensorFlow and PyTorch
  - Transfer learning with pre-trained models

5. Recurrent Neural Networks (RNNs) and NLP

- Understanding RNNs
  - Sequential data and RNN architecture
  - Long Short-Term Memory (LSTM) networks
  - Gated Recurrent Units (GRUs)
- Natural Language Processing (NLP)
  - Text preprocessing techniques
  - Word embeddings (Word2Vec, GloVe)
  - Implementing RNNs for text data

6. Natural Language Processing

6.1 Foundations of NLP

- Introduction to Natural Language Processing
  - What is NLP?
  - Applications of NLP (chatbots, sentiment analysis, etc.)
  - Basic concepts: tokens, stemming, lemmatization, stop words, etc.
- Text Preprocessing
  - Tokenization (word and sentence tokenization)
  - Removing stop words
  - Stemming and Lemmatization
  - Part-of-speech tagging
  - Named Entity Recognition (NER)

6.2 Linguistic Foundations

- Syntax and Parsing
  - Constituency Parsing
  - Dependency Parsing
- Morphology
  - Word formation
  - Affixes and roots
- Semantics
  - Word sense disambiguation
  - Semantic roles and relations
  - Latent Dirichlet Allocation (LDA)

6.3 Text Representation Techniques

- Bag of Words (BoW)
- TF-IDF (Term Frequency-Inverse Document Frequency)
- Word Embeddings
  - Word2Vec
  - GloVe
  - FastText

7. Language Models

- N-grams and Markov Models

Module-8

1. Foundations of Time Series

- What is Time Series?
  - Definition, components: trend, seasonality, noise, and cyclicity
  - Examples of time series in real-world applications (s**C**to**n**c**c**k**e** pr**t**i c**o**e**f** s**E**,**n** w**s**e**m**at**b**h**l**er **M** d**e**a**tt**h**a**o**, **d**es
- Time Series Data
  - Types of time series (univariate vs. multivariate)
  - Time series as ordered data
  - Time series and autocorrelation

Basic Time Series Concepts

- Time Series Decomposition
  - Additive vs. multiplicative models
  - Trend, seasonality, and residual components
  - Moving averages (simple, weighted)

Concept of Ensemble Methods

- Stationarity in Time Series
  - Stationary vs. non-stationary series
  - Unit root test (Dickey-Fuller test)
  - Differencing to achieve stationarity

- Autocorrelation and Partial Autocorrelation
  - Understanding autocorrelation functions (ACF)
  - Partial Autocorrelation Function (PACF)
  - Autocorrelation plots

2. Time Series Analysis

- Naive Forecasting Methods
  - Simple average
  - Naive and seasonal naive methods

    Concept of Ensemble Methods
- Exponential Smoothing
  - Simple Exponential Smoothing
  - Holt's Linear Trend Model
  - Holt-Winters Seasonal Model
- Autoregressive Integrated Moving Average (ARIMA)
  - AR, MA, ARMA models
  - Differencing and the ARIMA model (p, d, q)
  - Model selection using AIC, BIC, and grid search
  - Forecasting with ARIMA

3. Advanced Time Series Models

- Seasonal ARIMA (SARIMA)
  - Seasonal differencing
  - SARIMA model structure (P, D, Q)
- Autoregressive Conditional Heteroskedasticity (ARCH) and GARCH Models
  - Understanding volatility modeling
  - GARCH(1,1) model for financial time series
- Exponential Smoothing State Space Models
  - Understanding ETS models
  - Forecasting with ETS models
  - Comparing ARIMA and ETS

THANK YOU

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