

Training Programs by Pradyumn Sharma

Technologies:

- Machine Learning with Scikit-learn- 5 days
- Data Analytics- 5 days
- Blockchain, Cryptocurrencies, Web 3.0- 1 day
- Clean Code- 2 to 3 days
- MongoDB for Developers- 3 days
- Cassandra- 3 days
- Neo4j- 2 days
- Making Sense of the IT Buzzwords- 1 day
- Agile Software Development with Scrum- 2 days
- Agile Engineering Practices- 3 days
- Design Patterns- 3 days
- Software Estimation- 3 days
- MongoDB for DBAs: 2 days
- Deep Learning with TensorFlow: 5 days
- Integration Patterns: 2 days
- Software Architecture: 2 days

Others:

- An Introduction to the Vedas: 2 hours
- An Introduction to Upanishads: 2 hours
- An Introduction to Bhagvad Gita: 2 hours

Machine Learning with Scikit-learn

Objectives: Understanding Machine Learning (ML) concepts, building various types of ML models to solve diverse problems

Duration: 5 days

Course outline:

- Essential concepts and terminology
- Basics of regression, hypothesis, cost function, learning rate
- Essentials of numpy, pandas, matplotlib libraries in Python
- Stochastic Gradient Descent, feature scaling, polynomial regression, normal equation method
- Ridge regression, Lasso regression
- Logistic regression (classification), Random Forest
- Support Vector Machine, Kernels
- K-nearest neighbours, Naive Bayes Algorithm
- Artificial Neural Networks
- Clustering, K-means, anomaly detection
- Dimensionality reduction, model selection
- Preprocessing

Methodology highlights:

- Balanced mix of theoretical concepts, hands-on work, best practices.
- Extensive practical work using publicly available data sets
- Highly interactive sessions

Tools and Technologies used:

- Python, with numpy, pandas, matplotlib libraries
- Scikit-learn library
- Jupyter Notebook / Google Colaboratory

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Data Analytics

Objectives: Retrieve and analyze data, derive insights, visualize results, create dashboards, use statistical techniques

Duration: 5 days.

Course outline:

- Data analytics landscape, use cases
- Data workflows: data warehouse, data lake, etc
- Accessing data from a variety of sources
- Data wrangling
- MS Excel: Pivot Tables, reports, visualization
- Statistics: Descriptive Analysis (mean, median, standard deviation, percentile, quartile, outliers)
- Statistics: Inferential Analysis (binomial distribution, normal distribution, predictions, hypothesis testing)
- PowerBI / some other tool: data extraction, transformation, relationships, advanced reporting and visualization, dashboards, publishing reports
- Python with NumPy, Pandas: data manipulation, regular expressions, analysis, grouping, pivot tables

Methodology highlights:

- Balanced mix of essential concepts practical work using examples, exercises, and case studies.
- Various curated data sets for hands-on work. Alternatively, we can work with your data and help you create dashboards relevant to your work
- Highly interactive sessions

Concepts covered and tools used:

- Statistics (basic to intermediate)
- MS Excel
- PowerBI / some other analytics tool
- Python

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Blockchain, Cryptocurrencies, Web 3.0

Objectives: This is an introductory program, providing an overview of Blockchain and cryptocurrencies, as well as the emerging ideas behind Web 3.0 which are linked to these.

Duration: 1 day

Course outline:

- Introduction to Blockchain and cryptocurrencies (cryptos)
- Key concepts: cryptographic hash functions, hash pointers, cryptographic key pairs, anonymous parties
- Bitcoin transitions, Bitcoin mining, proof of work, distributed consensus
- Legal status of cryptos, future legal directions
- Ethereum, altcoins, proof of stake
- Smart contracts, distributed apps, oracles
- Blockchain types: public, private, consortium, hybrid
- Hyperledger
- Enterprise blockchain
- Business applications, non-fungible tokens (NFTs)
- Web 3.0 using blockchain

Methodology highlights:

- Fairly detailed coverage of all the essential concepts relating to blockchain and its implementation in Bitcoin and Ethereum
- Simple, non-technical demonstrations, no hands-on work.

Key takeaways:

- Reasonable insight into the functioning of blockchain and cryptos
- Understanding of blockchain use cases

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Clean Code

Objectives: Concepts and best practices of writing clean code, along with key Agile engineering practices (TDD, refactoring).

Duration: 2 to 3 days

Course outline:

- Characteristics of clean code
- Trade-offs in software development
- Understanding and applying simple algorithms
- Test-driven development (TDD)
- Refactoring
- Essentials of readable code
- Best practices for classes, functions, etc
- Indentation and comments
- Technical debt
- Code smells
- A few object-oriented design principles

Methodology highlights:

- Major part of the learning is through hands-on work
- Use of selected non-trivial programming exercises
- Most of the content is programming language-neutral.

Why This Program?

- There is ordinary code. And there is clean code. When your code is not clean, it can significantly hamper the productivity of a development team, making it increasingly harder to fix bugs, add features, or make changes.

MongoDB for Developers

Objectives: Build an in-depth understanding of working with MongoDB, a leading NoSQL database platform for applications revolving around large, complex data structures.

Duration: 3 days

Course outline:

- Introduction to Big Data, NoSQL and MongoDB
- Collections and JSON documents
- CRUD operations
- Complex data structures with nested JSON documents
- Essentials of MongoDB architecture
- Overview of replication (hands-on) and sharding (usually without hands-on work)
- Indexes
- Analyzing queries for performance
- Aggregation framework
- Schema design
- MongoDB driver for Java / C# / NodeJS

Methodology highlights:

- Balanced mix of key concepts, architecture, extensive hands-on work, best practices, design guidelines, real-world use cases
- Meaningful, realistic datasets for illustrating various aspects of MongoDB features

Target audience:

- Software developers, data modelers, application architects, solution architects.

Cassandra

Objectives: An in-depth program with a good insight into the capabilities and features of Cassandra, data modeling guidelines and its Java driver.

Duration: 3 days

Course outline:

- Introduction to Big Data, NoSQL, and Cassandra
- Cassandra Query Language (CQL), CQL Shell
- CRUD operations
- Cassandra architecture, cluster, data distribution, replication, read repair, failure scenarios
- Composite primary keys, partitioning and clustering
- Time-To-Live (TTL)
- Collection types: set, list, and map
- Data modeling, patterns and guidelines
- Cassandra driver for Java
- Monitoring, nodetool utility

Methodology highlights:

- Balanced mix of key concepts, architecture, extensive hands-on work, best practices, design guidelines, real-world use cases
- Meaningful, realistic datasets for illustrating various aspects of Cassandra features

Target audience:

- Software developers, data modelers, application architects, solution architects.

Neo4j

Objectives: An in-depth understanding of graph modeling, and a strong foundation for managing and querying data using Neo4j, including its Java driver.

Duration: 2 days.

Course outline:

- Introduction to NoSQL, and Neo4j
- The graph model, nodes, relationships, and attributes
- Queries with graph traversal
- Aggregation functions
- CRUD Operations for nodes and relationships
- Advance query operations, multi-relational graphs
- Query execution plan, profiling queries
- Graph data modeling, principles and guidelines
- Optimizing data models for performance and ease of querying
- Neo4j Java driver

Methodology highlights:

- Balanced mix of key concepts, architecture, extensive hands-on work, best practice, design guidelines, real-world use cases
- Meaningful, realistic datasets for illustrating various aspects of Neo4j features

Target audience:

- Software developers, data modelers, application architects, solution architects.

Making Sense of the IT Buzzwords

Objectives: A high-level understanding of many of the trending concepts and technologies in the field of IT, along with real-world use cases.

Duration: 1 day

Course outline:

- Data analytics
- Big Data, NoSQL
- Machine Learning, Deep Learning, Artificial Intelligence
- Cloud Computing
- Internet of Things
- Blockchain and cryptocurrencies
- Virtual Reality, Augmented Reality, Metaverse
- Mobility and social technologies
- Information Security
- Robotic Process Automation
- Gartner's predictions for top technology trends

Methodology highlights:

- Lively explanations of the key concepts and technologies
- Interesting, real-world case studies, videos, and a few demonstrations

Target audience:

- Executives, managers, business leaders across business functions. Not necessary to be an IT professional

Agile Software Development with Scrum

Objectives: An in-depth understanding of Scrum, one of the most prominent agile methodologies

Duration: 2 days

Course outline:

- Introduction to Agile, Agile Manifesto, and Scrum
- Waterfall model vs iterative development
- Roles and activities in Scrum
- Product Owner, Product Backlog, stories, epics, themes
- Sprint Zero, architecture envisioning
- Estimation, Planning Poker, prioritization, release planning
- Sprint planning, Sprint Backlog, Task Board
- Daily Scrum Meeting, Updating the Sprint Backlog and the Task Board
- Sprint Review, Sprint Retrospective, Sprint termination
- Revisiting estimates, Release burndown
- Scaling Scrum for large or distributed teams
- Miscellaneous topics

Methodology highlights:

- With the help of case studies and simulations, you will understand and experience various aspects and activities of Scrum.

Key takeaways:

- Principles behind agile methods
- The complete Scrum lifecycle
- Working with small iterations
- Estimation and planning
- Inspect & adapt mechanisms
- Scrum adoption in the organization

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Agile Engineering Practices

Objectives: Gain an insight into agile engineering practices. Learn to build the right product with high quality and in time.

Duration: 3 days

Course outline:

- Agile landscape, iterative development, DevOps principles
- Agile architecture and design
- SOLID principles
- Test-driven development with JUnit 5
- Automating user acceptance testing
- Mock objects using Mockito
- Browser automation using Selenium
- Build automation using Apache Maven
- Code smells, technical debt, refactoring
- Continuous integration and deployment using Jenkins
- Team collaboration and dynamics, pair programming

Methodology highlights:

- Appropriate mix of concepts and practical work. About 75% of the time in the program is hands-on work with curated examples and exercises

Recommended tools & technologies:

- Java, Eclipse
- JUnit 5, Fitnesse, Mockito, Selenium
- Maven, Jenkins
- Alternatives / additional tools as per your preferences

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Design Patterns

Objectives: Understanding some of the important GoF design patterns and foundational design principles. Audience: software developers, designers, architects.

Duration: 3 days

Course outline:

- UML class diagrams and sequence diagrams
- Single Responsibility Principle, Open-Closed Principle
- Low coupling, high cohesion, polymorphism
- Creational patterns: Factory Method, Abstract Factory, Builder, Singleton
- Structural patterns: Adapter, Facade, Composite, Proxy
- Behavioral patterns: Observer, State, Strategy, Template Method
- A few additional patterns may be covered based on specific requirements
- (The remaining GoF patterns can be covered with an additional 1.5 days).

Methodology highlights:

- Balanced mix of concepts, practical work, and applicability
- Various carefully selected examples and exercises for hands-on implementation.
- Programming in Java / C# / C++.

Key takeaways:

- The principles behind design patterns
- Applicability of various patterns in practical situations
- Trade-offs involved in various design alternatives

Software Estimation

Target audience: Presales and delivery teams

Duration: 3 days

Course outline:

- Practices from Agile methodologies
- Gathering information for estimation
- Breaking down a project into tasks, etc
- Risks: assessment, mitigation
- Considering the technology stack
- Dealing with uncertainties and unknowns
- Estimation techniques, Planning Poker
- Challenges in fixed bid proposals in agile projects, how to deal with them
- Actionable execution plan
- Creating an estimation framework
- Presentation, negotiations, closure
- Monitoring, reviews, retrospectives

Methodology highlights:

- Balanced mix of [key concepts, principles, best practices] and [examples, exercises, case studies]
- Review of existing template, process, a few of your existing proposals with estimates
- Highly interactive sessions

Key takeaways

- Estimation with increasing accuracy...
- ... with respect to human and other resources, delivery dates, milestones, interim timelines, technology landscape
- Best practices around estimation
- New / modified framework / template for estimation

Computer Algorithms

Objectives: Sharpen your skills to articulate algorithms for non-trivial computing problems, as well as efficient ways to implement them. Go beyond the basics.

Duration: 3 days

Course outline:

- Common trade-offs in computer algorithms
- The Big-O notation
- Analysis of algorithms
- Divide and conquer
- Recursive algorithms
- Greedy algorithms
- Dynamic programming
- Data structures
- Algorithms on graphs
- Algorithms on strings

Methodology highlights:

- Less theoretical lectures, lots of hands-on work.
- Class assignments selected from a wide range of non-trivial computing problems, tailored to the participants' background and interests.
- Participants are strongly encouraged to use TDD approach for their implementation

Target audience:

- Anybody who writes programs for a living. Or for fun. And wants to become a good programmer. They may use any of the regular programming languages

An Introduction to the Vedas

Objectives: A brief introduction to the Vedas and related Vedic literature.

Duration: 2 hours

Course outline:

- The various books of the Vedas and subsequent Vedic literature
- The origins of the Vedas
- The Vedic deities
- Oral traditions for preserving the Vedic text with integrity for thousands of years
- A glimpse of Vedic thoughts through about 15 selected verses, covering diverse topics such as the desirable code of conduct, philosophy, family life, society, meditation, origin of the universe, etc.
- The field of Vedic interpretation
- Pointers for further studies

What are the Vedas?

- Foundation of Indian thought, religions, philosophy, values, traditions, rituals, culture, etc.
- Written in ancient Sanskrit.
- A collection of about 20,000 verses in four books.



**Faculty: Mr. Pradyumn Sharma- CEO of Pragati Software Pvt. Ltd.
IIM Ahmedabad Alumnus**

**Clients for whom
training programs
have been conducted**

- BNP Paribas India Solutions Private Limited
- Citibank
- CLSA Technology & Services Pvt. Ltd
- Connectwise
- GE Oil & Gas India Private Limited
- Hindustan Petroleum Corpn Ltd.
- Kotak Mahindra Life
- Insurance Company Limited
- Kotak Mahindra Bank Ltd.
- Nomura Services India Private Limited
- Oracle Financial Services Software Ltd
- Quinnox Consultancy Services Limited
- Siemens Limited

About 38 years of experience in the IT industry. Played various roles such as developer designer. architect. database administrator. project manager. business analyst tester. Now primarily trainer. coach and consultant. Currently, CEO of Pragati Software Pvt Ltd. Mumbai (India). a prominent IT training company.

With the vast experience in the IT industry, a passion to keep up-to-date with the latest technologies. trends and events. and an engaging style of public speaking. is well equipped to share knowledge on a wide range of subjects.

Primary Areas of Interest and Expertise:

- Machine Learning
- Big Data and NoSQL
(MongoDB,Cassandra. Neo4J)
- Agile Software Development Methodologies (Scrum. XP. Kanban. SAFe)
- Software Architecture. Solution Architecture. Enterprise Architecture (TOGAF)
- Writing Good Programs

Conference Speakership:

- Saturn Conferences. organized by Software Engineering Institute of Carnegie-Mellon University
(2012, 2013, 2014, 2017)
- Scrum Gathering organized by Scrum Alliance (2008, 2010, 2011. 2012)
- Agile Conference. organized by Agile Alliance (2011)
- Agile India. organized by Agile Software Community of India (2006, 2007, 2010)
- Agility Today 2020, organized by Agile Virgin
(2020)

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