



# GETIN TECHNOLOGIES

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## **COURSE NAME: DATA SCIENCE TRAINING**

### **Module 4**

[Visit our website for Course Fees and Course Duration](#)

### **Placement Eligibility:**

**Eligible:** Any Bachelor Degree, Any Master Degree, MBA

**Not Eligible:** Diploma

### **Class Mode:**

**Classroom | Online | Recorded Session | AI Session**

**If you have Completed Course, You want only Placements**

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# DATA SCIENCE COURSE 4 SYLLABUS

## SQL:

### Introduction

- The Relational Model

### Understanding Basic SQL Syntax:

- Basic SQL Commands – SELECT
- Basic SQL Commands – INSERT
- Basic SQL Commands – UPDATE
- Basic SQL Commands – DELETE

### Querying Data with the SELECT Statement:

- The SELECT List
- SELECT List Wildcard (\*)
- The FROM Clause
- How to Constrain the Result Set
- DISTINCT and NOT DISTINCT

### Filtering Results with the Where Clause:

- WHERE Clause
- Boolean Operators
- The AND Keyword
- The OR Keyword
- Other Boolean Operators BETWEEN, LIKE, IN, IS, IS NOT

### Shaping Results with ORDER BY and GROUP BY:

- ORDER BY

- Set Functions
- Set Function And Qualifiers
- GROUP BY
- HAVING clause

## Matching Different Data Tables with JOINS:

- CROSS JOIN
- INNER JOIN
- OUTER JOINS
- LEFT OUTER JOIN
- RIGHT OUTER JOIN
- FULL OUTER JOIN
- SELF JOIN

## Creating Database Table stamp:

- CREATE DATABASE
- CREATE TABLE
- NULL Values
- PRIMARY KEY
- CONSTRAINT
- ALTER TABLE
- DROP TABLE

## PYTHON:

### Introduction to Python

- What is Python and the history of Python?
- Unique features of Python
- Install Python and Environment Setup
- First Python Program
- Python Identifiers, Keywords, and Indentation

- **Comments and document interlude in Python**
- **Command-line arguments**
- **Getting User Input**
- **Python Data Types**
- **What are the variables?**

## **Control Statements**

- **If**
- **If-elif-else**
- **while loop**
- **for loop**
- **Break**
- **Continue**
- **Assert**
- **Pass**
- **return**



## **List, Ranges & Tuples in Python**

- **Introduction**
- **Lists in Python**
- **Generators and Yield**
- **Generators Comprehensions and Lambda Expressions**
- **Next() and Range()**
- **Understanding and using Range**

## **Python Dictionaries and Sets**

- **Introduction to the section**
- **Python Dictionaries**
- **More on Dictionaries**
- **Sets**

## **Python built-in function**

- Python Modules & Packages
- Python User defined functions
- Defining and calling Function
- The anonymous Function

## **Python Object Oriented**

- Overview of OOP
- Creating Classes and Objects
- Constructor
- The self variable
- Types Of Variables
- Namespaces
- Inheritance
- Types of Methods
- Instance Methods Static Methods Class Methods
- Accessing attributes
- Built-In Class Attributes
- Destroying Objects
- Abstract classes and Interfaces
- Abstract Methods and Abstract class
- Interface in Python
- Abstract classes and Interfaces

## **MACHINE LEARNING:**

### **Introduction to Machine Learning:**

- What is Machine Learning?
- Types of Machine Learning (Supervised, Unsupervised, Reinforcement Learning)

- Applications of Machine Learning
- Python and Libraries for Machine Learning (NumPy, Pandas, Scikit-Learn)

## Data Preprocessing

- Data Cleaning and Exploration
- Feature Engineering
- Data Scaling and Normalization
- Handling Missing Data

## Machine Learning Techniques

- Types of Learning
- Supervised Learning
- Unsupervised Learning
- Advice for Applying Machine Learning
- Machine Learning System Design

## Supervised Learning

- Regression
- Classification

## Supervised Learning - Regression

- Linear Regression & Logistic: A Model-Based Approach
- Regression fundamentals : Data and Models
- Feature selection in Model building
- Evaluating over fitting via training/test split
- Training/ Test curves
- Adding other features
- Regression ML block diagram

## Supervised Learning - Classification

- **Classification fundamentals : Data and Models**
- **Understanding Decision Trees and Naive Bayes**
- **Feature selection in Model building**
- **Linear classifiers**
- **Decision boundaries**
- **Training and evaluating a classifier**
- **False positives, false negatives, and confusion matrices**
- **Classification ML block diagram**

## **Unsupervised Learning**

- **Clustering**
- **Recommendation**
- **Deep Learning**

## **Unsupervised Learning - Clustering**

- **Clustering System Overview**
- **Clustering fundamentals : Data and Models**
- **Feature selection in Model building**
- **Prioritizing important words with tf-idf**
- **Clustering and similarity ML block diagram**

## **Unsupervised Learning - Deep Learning**

- **Deep Learning: Searching for Images**
- **Learning very non-linear features with neural networks**
- **Application of deep learning to computer vision**
- **Deep learning performance**
- **Demo of deep learning model on ImageNet data**
- **Deep learning ML block diagram**

## **Natural Language Processing (NLP)**

- **Text Preprocessing**

- Bag of Words and TF-IDF
- Sentiment Analysis
- Text Classification
- Word Embeddings (Word2Vec, GloVe)

## Neural Networks and Deep Learning

- Introduction to Neural Networks
- Feedforward Neural Networks
- Convolutional Neural Networks (CNN)
- Recurrent Neural Networks (RNN)
- Transfer Learning and Pretrained Models

## Reinforcement Learning

- Introduction to Reinforcement Learning
- Markov Decision Processes (MDPs)
- Q-Learning
- Deep Q-Networks (DQN)
- Policy Gradient Methods

## Model Deployment and Production

- Model Serialization
- REST APIs for Model Deployment
- Cloud Services for Model Deployment

## DEEP LEARNING:

### Introduction to Deep Learning

- Overview of Deep Learning
- History and Evolution of Neural Networks
- Key Deep Learning Concepts



- Python and Deep Learning Libraries (TensorFlow, Keras, PyTorch)

## Fundamentals of Neural Networks

- Perceptrons and Sigmoid Neurons
- Activation Functions
- Feedforward Neural Networks (FNN)
- Backpropagation Algorithm

## Advanced Neural Network Architectures

- Convolutional Neural Networks (CNN)
- Recurrent Neural Networks (RNN)
- Long Short-Term Memory (LSTM)
- Gated Recurrent Unit (GRU)

## Training Deep Neural Networks

- Loss Functions and Optimization
- Vanishing and Exploding Gradients
- Regularization Techniques
- Weight Initialization
- Batch Normalization

## Deep Learning for Computer Vision

- Image Classification
- Object Detection
- Image Segmentation
- Style Transfer
- Transfer Learning with Pretrained Models

## Deep Learning for Natural Language Processing (NLP)

- Word Embeddings (Word2Vec, GloVe)
- Recurrent Neural Networks for NLP
- Sequence-to-Sequence Models

- Attention Mechanisms
- Transformer Models (e.g., BERT)

## Generative Models

- Generative Adversarial Networks (GANs)
- Variational Autoencoders (VAEs)
- Applications in Image and Text Generation

## Reinforcement Learning and Deep Reinforcement

### Learning

- Introduction to Reinforcement Learning
- Q-Learning
- Deep Q-Networks (DQN)
- Policy Gradient Methods
- Applications in Game Playing and Robotics

## Unsupervised Learning with Deep Learning

- Autoencoders
- Self-Organizing Maps (SOM)
- t-Distributed Stochastic Neighbor Embedding (t-SNE)
- Clustering with Deep Learning

## Advanced Topics in Deep Learning

- Attention Mechanisms and Transformer Architectures
- Transfer Learning Strategies
- Model Interpretability and Explainability
- Ethics and Bias in Deep Learning

# TABLEAU:

## INTRODUCTION

- Start Page
- Show Me
- Connecting to Excel Files
- Connecting to Text Files
- Connect to Microsoft SQL Server
- Connecting to Microsoft Analysis Services
- Creating and Removing Hierarchies
- Bins
- Joining Tables
- Data Blending

## Creating Your First visualization

- Getting started with Tableau Software
- Using Data file formats
- Connecting your Data to Tableau
- Creating basic charts (line, bar charts, Treemaps)
- Using the Show me panel.

## Tableau Calculations

- Overview of SUM, AVR, and Aggregate features
- Creating custom calculations and fields
- Applying new data calculations to your visualization

## Formatting Visualizations

- Formatting Tools and Menus
- Formatting specific parts of the view

- **Editing and Formatting Axes**

## **Manipulating Data in Tableau**

- **Cleaning-up the data with the Data Interpreter**
- **Structuring your data**
- **Sorting and filtering Tableau data**
- **Pivoting Tableau data**

## **Advanced Visualization Tools**

- **Using Filters**
- **Using the Detail panel**
- **Using the Size panels**
- **Customizing filters**
- **Using and Customizing tooltips**
- **Formatting your data with colors**

## **Creating Dashboards & Stories**

- **Using Storytelling**
- **Creating your first dashboard and Story**
- **Design for different displays**
- **Adding interactivity to your Dashboard**

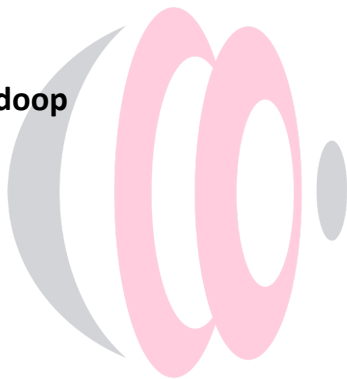
## **Distributing & Publishing Your Visualization**

- **Tableau file types**
- **Publishing to Tableau Online**
- **Sharing your visualization**
- **Printing and exporting**

# Big Data

## INTRODUCTION TO BIG DATA AND HADOOP

- Types of Digital Data
- Introduction to Big Data
- Big Data Analytics
- History of Hadoop
- Apache Hadoop
- Analysing
- Data with Unix tools
- Analysing Data with Hadoop
- Hadoop Streaming
- Hadoop Echo System



## HDFS(Hadoop Distributed File System)

- The Design of HDFS
- HDFS Concepts
- Command Line Interface
- Hadoop file system interfaces
- Data flow
- Data Ingest with Flume and Scoop and Hadoop archives
- Hadoop I/O: Compression, Serialization, Avro and File-Based
- Data structures.

## Map Reduce

- **Anatomy of a Map Reduce Job Run**
- **Failures**
- **Job Scheduling**
- **Shuffle and Sort**
- **Task Execution**
- **Map Reduce Types and Formats**
- **Map Reduce Features.**

## **Hadoop Eco System**

- **Pig**
  - **Introduction to PIG Execution**
  - **Modes of Pig**
  - **Comparison of Pig with Databases**
  - **Grunt**
  - **Pig Latin**
  - **User Defined Functions**
  - **Data Processing operators.**
- **Hive**
  - **Hive Shell**
  - **Hive Services**
  - **Hive Metastore**
  - **Comparison with Traditional Databases**
  - **HiveQL**
  - **Tables**
  - **Querying**
  - **Data and User Defined Functions.**
- **Hbase**
  - **HBasics Concepts**

- **Clients**
- **Example**
- **Hbase Versus RDBMS.**



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