

DTI-DSA-001

Fundamentals of US Healthcare and Data Analytics

Program Information



Nature of the Course
Theory + Practical



Total Hours per Day
2 hours



Course Duration
2 Months (80 Hours)

Overview of US Health Care

Part 1 : Key Data Components

Eligibility

Objective: Provide overview of Eligibility file, processing and its analysis steps

- Introduction to Eligibility
- Analysis of Eligibility Data
- Processing Raw File

Claims

Objective: Provide overview of Claims file, processing and its analysis steps

- Introduction to Claims
- Analysis of Claims Data
- Processing Raw File

Pharmacy

Objective: Provide overview of Pharmacy file, processing and its analysis steps

- Introduction to Pharmacy
- Analysis of Pharmacy Data
- Processing Raw File

Provider

Objective: Provide overview of Provider file, processing and its analysis steps

- Introduction to Provider
 - Analysis of Provider Data
 - Processing Raw File
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Part 2 : MRF

Introduction to MRF (Machine Readable Files)

Objective Provide overview of the role and significance of MRF in the US healthcare system

- Introduction to MRF in HealthCare
- MRF standards and formats
- Use Cases and Applications

Components of a MRF

Objective: Provide knowledge of various components and its significance

- Billing Code
 - Service Code Type
 - Modifier Code
 - Bundle Code
 - Negotiation Arrangements
 - Negotiation Type
 - Billing Class
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Part 3: SQL

Introduction to SQL

Objective: Introduce Students to the basics of SQL

- Introduction to SQL
- Install and Setup Database

Basic SQL Queries

- Data Types, Primary-Foreign Keys & Constraints
- DDL and DML Statements

Create Table In SQL & Create Database

- INSERT UPDATE, DELETE & ALTER Table
 - SELECT Statement & WHERE Clause
 - Aggregate Functions
 - Group By and Having clause
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JOINS in SQL

- Different Types of JOINS
- SELF JOIN, UNION & UNION ALL
- Use cases of JOIN operation

Managing Database Objects

- Working with Indexes, Views, Synonyms, and Sequences
 - Partitioning and Materialized Views
 - Introduction of PL SQL, Stored Procedure, Functions, Trigger
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Part 4: Mongo

Introduction to MongoDB

Objective: Introduce students to the fundamentals of MongoDB

- Overview of NoSQL Databases
- Introduction to MongoDB
- Installing and Setting Up MongoDB

Data Modeling in MongoDB

Objective: Understand the principles of data modeling in MongoDB

- Document-Oriented Data Model
- Collections and Documents
- Schema Design Best Practices

MongoDB CRUD Operations

Objective: Learn the basic CRUD (Create, Read, Update, Delete) operations in MongoDB

- Introduction to Indexing
- Index Strategies
- Performance Optimization Techniques

Aggregation Framework

Objective: Introduce the MongoDB Aggregation Framework for complex data transformations

- Overview of Aggregation Framework
 - Aggregation Operators
 - Real-world Examples
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Part 5: PySpark

Introduction to Apache Spark and PySpark

Objective: Introduce students to the basics of Apache Spark and PySpark

- Introduction to Big Data and Apache Spark
- Introduction to PySpark
- Setting Up a PySpark Environment

RDDs (Resilient Distributed Datasets)

Objective: Understand the fundamentals building blocks of PySpark – RDD

- Introduction to RDDs
- Creating and Transforming RDDs
- Actions on RDDs

PySpark DataFrames

Objective: Learn about PySpark DataFrames and their advantages over RDDs

- Introduction to DataFrames
- Creating and Manipulating RDDs
- SQL Operations with DataFrames

PySpark Use Cases in US Healthcare

Objective: Practice use case scenario with healthcare dataset.

Part 6: ETL using Pyspark and SQL

Introduction to ETL

Objective: Introduce student to the concept of ETL

- Overview of ETL

PySpark DataFrames and SQL Queries

Objective: Introduce PySpark DataFrames and SQL queries for data manipulation

- Working with PySpark Dataframe
- Executing SQL Queries with PySpark

Extracting Data with PySpark

Objective: Cover techniques for extracting data from various sources

- Reading data from Files
- Connecting to Databases
- Web Scraping with PySpark

Transforming Data with PySpark

Objective: Explore various data transformations techniques in PySpark

- Data Cleaning and Preprocessing
- Feature Engineering
- Aggregations and Grouping

Loading Data with PySpark

Objective: Learn method for loading transformed data into different destinations

- Writing data to Files
- Loading data to Databases
- Publishing data to Cloud Storage

Advance ETL Techniques

Objective: Explore advanced ETL topics based on the interests and needs of the students

Part 7: Data Quality

Introduction to Data Quality

- Importance of Data Quality in Healthcare Analytics
- Understanding Data Quality Metrics and Parameters
- Data Correctness

Definition and Significance

- Methods for Assessing Data Correctness
- Accuracy of Data Entry
- Data Validation Techniques
- Error Identification and Rectification Processes

Data Completeness

- Definition and Importance in Healthcare Data
- Measures to Assess Data Completeness
- Missing Data Handling Techniques
- Estimation and Imputation Methods
- Evaluating the Impact of Incomplete Data on Analysis

Data Quality Control

- Overview of Quality Control in Data Management
 - Establishing Data Quality Standards and Procedures
 - Implementation of Quality Control Processes
 - Quality Control Reporting Process
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Part 8: AWS

Introduction to AWS for Data Analyst

Objective: Provide an overview of AWS services and tools relevant to data analysis

- Introduction to Cloud computing
- Overview of AWS
- AWS pricing model

Data Storage in AWS

Objective: Explore AWS services for Data Storage

- Amazon S3 (Simple Storage Service)
- Amazon RDS (Relational Database Service)
- AWS Glue for Data Catalog and ETL

Data Processing with AWS

Objective: Introduce Amazon services for data processing and analysis

- AWS Athena for Querying S3 Data (With practical)
 - Amazon EMR (Elastic MapReduce) (theory)
 - AWS Lambda for Serverless computing (theory)
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