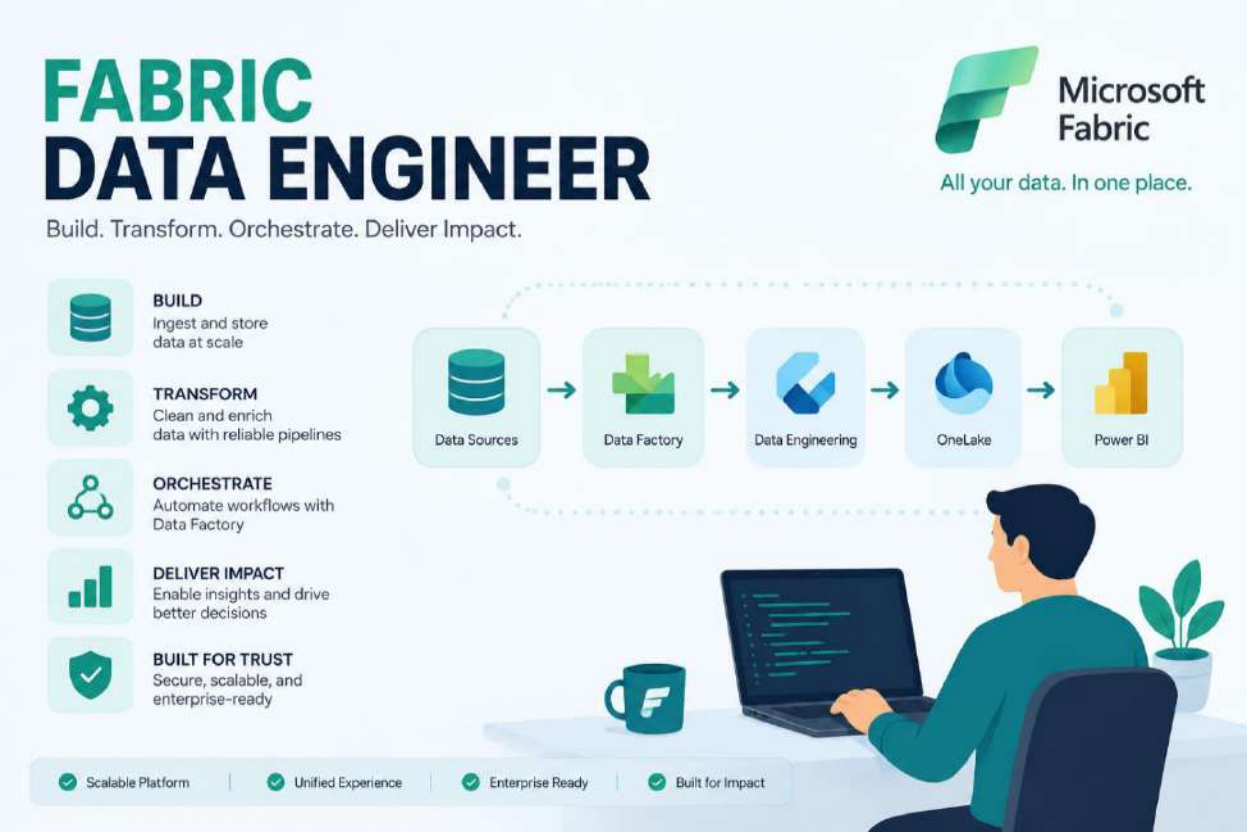
FABRIC DATA ENGINEERING

100% Practical, Step by Step. Result Driven.



This Fabric Data Engineering Couse is divided into THREE comprehensive modules:

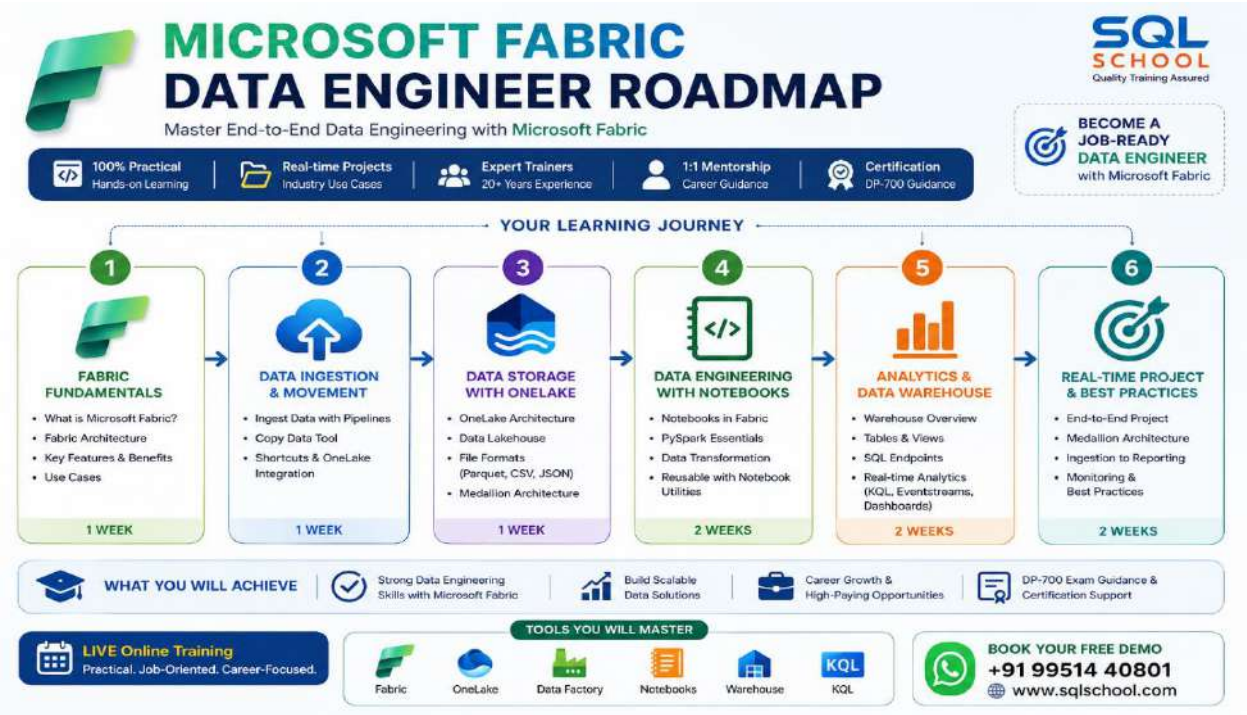
- **Module 1: SQL Server (MSSQL) & TSQL**
- **Module 2: Fabric Data Engineering**
- **Module 3: Power BI (Optional, Recommended for Experienced Profiles)**

Who Should Join?

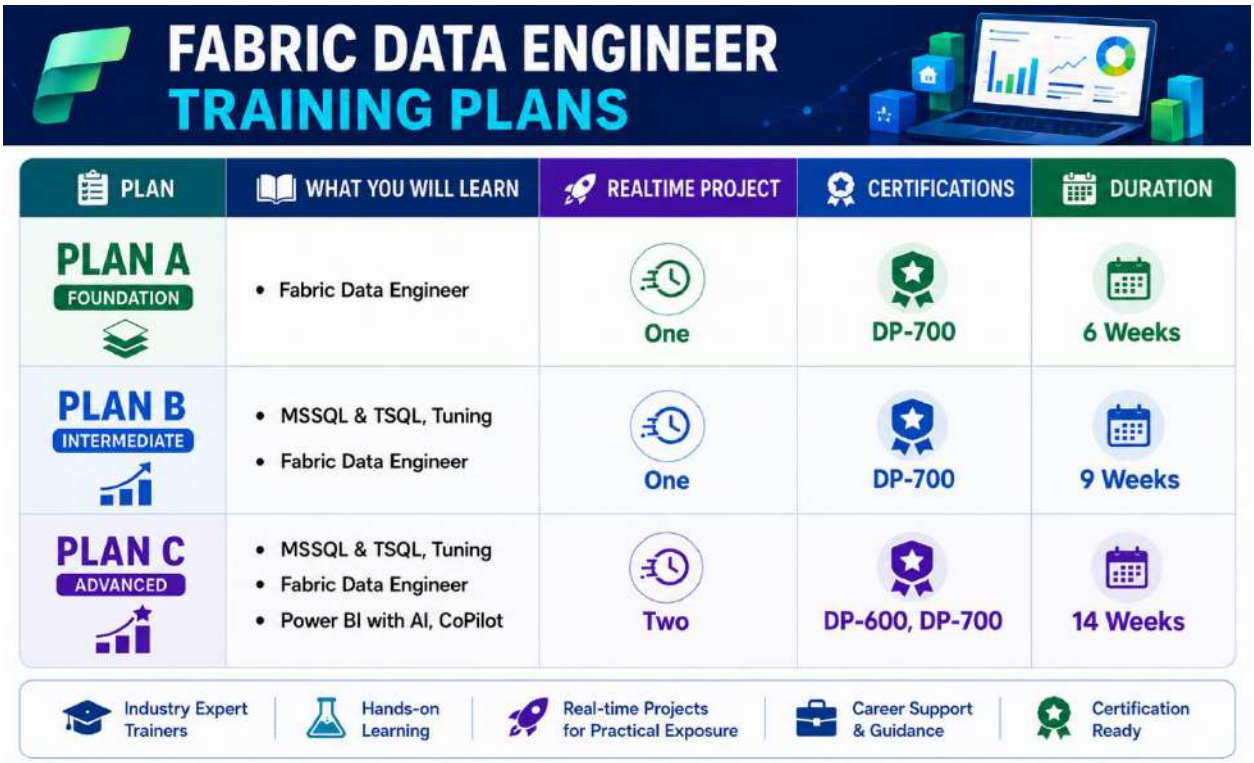
- SQL Developers
- BI Developers
- Data Analysts

Prerequisites

- No experience required
- We start from the basics and build your skills step by step.



Fabric Training Plans:



🔥 Detailed Course Content 🔥

Module 1: SQL Server (MSSQL), TSQL

Ch 1: SQL Database Job Roles

- ✓ Database Intro
- ✓ OLTP, DWH, OLAP
- ✓ DBMS Basics
- ✓ Data Engineer Job Roles

Ch 2: Database Intro & Installations

- ✓ SQL Server Installations
- ✓ Instance & Collations
- ✓ SSMS Tool Installation
- ✓ Connections, Authentications

Ch 3: SQL Basics V1 (Commands)

- ✓ SQL Basics (DDL, DML, etc..)
- ✓ Creating Databases, Tables
- ✓ Data Inserts (GUI, SQL)
- ✓ Basic SELECT Queries

Ch 4: SQL Basics V2 (Commands, Operators)

- ✓ DDL: Create, Alter, Drop
- ✓ DML: Insert, Update, Delete
- ✓ DQL: Select, Fetch
- ✓ Add, Truncate Statements
- ✓ SQL Operators

Ch 5: Data Types & Variables

- ✓ Integer Data Types
- ✓ Character, MAX Data Types
- ✓ Decimal & Boolean Data Types
- ✓ Date and Time Data Types
- ✓ SQL_Variant Type

Ch 6: Data Imports From Files

- ✓ Data Imports with Excel
- ✓ Data Imports with CSV
- ✓ Auto Detection of DataTypes
- ✓ OLE-DB Connections
- ✓ Order By, TOP, OFFSET

Ch 7: Sub Queries

- ✓ Basic Sub Queries
- ✓ Aggregations
- ✓ Combining Queries

- ✓ UNION, UNION ALL

Ch 8: Schemas & Batches

- ✓ Schemas: Creation, Usage
- ✓ Schemas & Table Grouping
- ✓ Real-world Banking Database
- ✓ 2 Part, 3 Part & 4 Part Naming
- ✓ Batch Concept & "Go" Command

Ch 9: Constraints, Keys & RDBMS

- ✓ Null, Not Null Constraints
- ✓ Unique Key & Check
- ✓ Primary Key Constraint
- ✓ Foreign Keys, Default
- ✓ DB Diagrams & ER Models

Ch 10: Normal Forms & RDBMS

- ✓ Normal Forms: 1 NF, 2 NF
- ✓ 3 NF, BCNF and 4 NF
- ✓ 1:1, 1:M, M:1 Cardinality
- ✓ Cascading Keys
- ✓ Self Referencing Keys

Ch 11: Joins & Queries

- ✓ Joins: Table Comparisons
- ✓ Inner Joins & Matching Data
- ✓ Outer Joins: LEFT, RIGHT
- ✓ Full Outer Joins & Aliases
- ✓ Self Joins & Aliases

Ch 12: Views & RLS

- ✓ Views: Realtime Usage
- ✓ DML, SELECT with Views
- ✓ Excel Analytics with Views
- ✓ Important System Views

Ch 13: Stored Procedures - 1

- ✓ Stored Procedures: Realtime Use
- ✓ Parameters Concept with SPs
- ✓ Procedures with SELECT
- ✓ System Stored Procedures
- ✓ Stored Procedures, Tuning

Ch 14: Stored Procedures - 2

- ✓ Merge Statement (Upsert)
- ✓ Merge with OLTP & DWH
- ✓ Matched and Not Matched

- ✓ Merge Statement inside SPs
- ✓ SP Recompilations

Ch 15: User Defined Functions - 1

- ✓ Scalar Functions in Real-world
- ✓ Inline & Multiline Functions
- ✓ Parameterized Queries
- ✓ Variables & Parameters
- ✓ Function Executions

Ch 16: User Defined Functions - 2

- ✓ Date & Time Functions
- ✓ String Functions & Queries
- ✓ Aggregated Functions & Usage
- ✓ Window Functions (Rank)
- ✓ Row_Number, DenseRank
- ✓ Partition By & Order By

Ch 17: Triggers & Automations

- ✓ Need for Triggers in Real-world
- ✓ DDL & DML Triggers
- ✓ For / After Triggers
- ✓ Instead Of Triggers
- ✓ Memory Tables with Triggers
- ✓ Disabling DMLs Triggers

Ch 18: Group By Queries

- ✓ Group By, Distinct
- ✓ GROUP BY, HAVING
- ✓ Cube( ) and Rollup( )
- ✓ Sub Totals & Grand Totals
- ✓ Grouping( ) & Usage

Ch 19: Joins with Group By

- ✓ 3 Table, 4 Table Joins
- ✓ Join Queries & WHERE
- ✓ Join Queries & Group By
- ✓ IIF(), CASE Statement
- ✓ Query Execution Order

Ch 20: Transactions & ACID

- ✓ Auto Commit Transaction
- ✓ Explicit Transactions
- ✓ COMMIT, ROLLBACK
- ✓ Checkpoint & Query Blocking
- ✓ READPAST, LOCKHINT

Ch 21: Indexes Basics, Tuning

- ✓ **Clustered Index, Primary Key**
- ✓ **Non Clustered Index**
- ✓ **Query Optimizer**
- ✓ **Tuning Join Queries**
- ✓ **Tuning Group By Queries**

Ch 22: CTEs & Tuning

- ✓ **Common Table Expression**
- ✓ **CTEs for Data Retrieval**
- ✓ **CTEs for DML Operations**
- ✓ **CTEs for Data Cleansing**
- ✓ **Using CTEs with Row Number**

Ch 23: Cursors & Temp Tables

- ✓ **Cursors & Fetch**
- ✓ **Local Temp Tables**
- ✓ **Global Temp Tables**
- ✓ **SELECT..INTO Statement**

Ch 24: Capstone Project (HealthCare Management System)

- ✓ **ECommerce Database**
- ✓ **Data Validations**
- ✓ **Query Writing**
- ✓ **Query Tuning**
- ✓ **Excel Analytics**

Module 2: Fabric Data Engineering

Week 1: Microsoft Fabric Fundamentals & OneLake

Learning Modules

- ➢ Introduction to Microsoft Fabric
- ➢ Understand OneLake Architecture
- ➢ Lakehouse Fundamentals
- ➢ Delta Lake Foundations
- ➢ Fabric Capacity & Workspaces

Hands-on Labs

- ✓ Create Fabric Trial Workspace
- ✓ Create Lakehouse
- ✓ Upload CSV files
- ✓ Explore OneLake Explorer
- ✓ Configure Workspace Roles

Learning Outcome

- ✓ Understand Fabric architecture
- ✓ Differentiate Lakehouse, Warehouse, Event house

Week 2: Data Ingestion & Data Factory

Learning Modules

- Data Factory in Microsoft Fabric
- Dataflows Gen2
- Incremental Loading
- Data Integration Patterns
- Data validation
- SCD Type 1
- SCD Type 2
- Data Pipelines
- Copy Activities & Pipelines
  - → Parameters & Variables
  - → Expressions
  - → Lookup
  - → ForEach
  - → If Condition
  - → Stored Procedure
  - → Notebook Activity
  - → Pipeline-to-Pipeline execution
  - → Scheduling & Triggers
  - → Error Handling
  - → Retry mechanisms
  - → Logging
  - → Incremental Loads
  - → Metadata-driven Pipelines

Hands-on Labs

Lab 1: Pipeline Development

- ✓ Create Pipeline
- ✓ Copy from Azure SQL Database
- ✓ Copy from ADLS Gen2
- ✓ Schedule execution

Lab 2: Dataflows Gen2

- ✓ Import CSV
- ✓ Apply transformations
- ✓ Load to Lakehouse

Lab 3: Incremental Processing

- ✓ Watermark columns
- ✓ Historical + Delta Load

Learning Outcome

- ✓ Pipeline orchestration
- ✓ Incremental ingestion strategies

Week 3: Spark & Notebook Engineering

Learning Modules

- Apache Spark Fundamentals
- Spark SQL
- PySpark Transformations
- Delta Tables
- Medallion Architecture
- **PySpark**
  - → DataFrames
  - → Schema management
  - → Joins
  - → Aggregations
  - → Window Functions
  - → Null handling
  - → Deduplication
  - → JSON processing
  - → Explode
  - → UDFs
  - → Date/time transformations
- **Delta Lake**
  - → MERGE
  - → UPDATE/DELETE
  - → Schema evolution
  - → Time Travel
  - → OPTIMIZE
  - → VACUUM
  - → Partitioning
- **Performance**
  - → Lazy evaluation
  - → Shuffle
  - → Partitioning
  - → Repartition vs Coalesce
  - → Cache/Persist
  - → Spark execution plan basics

Labs

- ✓ Create Notebook
- ✓ Bronze Layer
- ✓ Raw ingestion
- ✓ Silver Layer
- ✓ Cleansing
- ✓ Deduplication
- ✓ Gold Layer
- ✓ Business aggregations

Advanced Labs

- ✓ Delta Merge
- ✓ Upsert operations

- ✓ Performance Optimizations
- ✓ Partitioning

Learning Outcome

- ✓ PySpark development
- ✓ Delta Lake engineering

Week 4: Data Warehouse Engineering

Learning Modules

- ➢ Fabric Warehouse
- ➢ T-SQL Development
- ➢ Dimensional Modeling
- ➢ Fact & Dimension Design
- ➢ Performance Optimization
- ➢ Star Schema
- ➢ Surrogate Keys
- ➢ Fact table grain
- ➢ Conformed Dimensions
- ➢ Date Dimension
- ➢ Incremental Fact Loading

Labs

- ✓ Create Warehouse
- ✓ Star Schema

Build:

- ✓ FactSales
- ✓ DimCustomer
- ✓ DimDate
- ✓ DimProduct
- ✓ Warehouse Objects
- ✓ Views
- ✓ Stored Procedures
- ✓ Functions

Learning Outcome

- ✓ Modern Data Warehousing
- ✓ Analytical Modeling

Week 5: Real-Time Analytics & Streaming

Learning Modules

- ➢ Eventstream
- ➢ Real-Time Analytics
- ➢ Eventhouse
- ➢ KQL Fundamentals
- ➢ Streaming Solutions

Labs

- ✓ Eventstream
- ✓ Simulated IoT Device
- ✓ Ingest streaming data
- ✓ Route data to Lakehouse
- ✓ Eventhouse
- ✓ Create KQL Tables
- ✓ Build near real-time reporting

Learning Outcome

- ✓ Streaming analytic
- ✓ Eventhouse & KQL

Week 6: Enterprise Fabric – Security, Governance, DevOps & Monitoring

Learning Modules

- ➢ Security in Fabric
- ➢ Governance
- ➢ Git Integration
- ➢ Deployment Pipelines
- ➢ Monitoring & Troubleshooting
- ➢ Workspace architecture
- ➢ Dev/Test/Prod strategy
- ➢ Git branching strategy
- ➢ Environment configuration
- ➢ Secrets/credentials concepts
- ➢ Lineage
- ➢ Impact analysis
- ➢ Capacity monitoring
- ➢ Pipeline monitoring
- ➢ Spark monitoring
- ➢ Cost optimization

Labs

- ✓ Security
- ✓ Workspace Roles
- ✓ Object Level Security
- ✓ Row Level Security
- ✓ Git Integration
- ✓ Commit Changes
- ✓ Monitoring Hub
- ✓ Capacity Metrics
- ✓ Refresh Tracking

Learning Outcome

- ✓ Enterprise Deployment
- ✓ Deployment - Dev → Test → Prod
- ✓ Branch Management
- ✓ Connect Fabric Workspace

Week 7: Real-Time Project

Project Activities

- Ingest data from Azure SQL, ADLS, CSV & APIs
- Build Fabric Data Factory Pipelines
- Implement Full & Incremental Loads
- Create Bronze, Silver & Gold Layers
- Perform Data Cleansing & Transformations using PySpark
- Build Delta Tables
- Implement MERGE & Upsert Operations
- Handle Duplicate & Missing Data
- Build Fact & Dimension Tables
- Implement Star Schema
- Create Fabric Warehouse
- Automate End-to-End Pipeline Execution
- Implement Error Handling & Logging
- Monitor Pipeline & Spark Jobs
- Optimize Lakehouse & Warehouse Performance

Enterprise Deployment

- Configure Dev, Test & Production Workspaces
- Integrate Fabric with Git
- Branch & Version Management
- Configure Deployment Pipelines
- Deploy Dev → Test → Production
- Configure Workspace & Item-Level Security
- Implement RLS / OLS
- Monitor Fabric Workloads
- Capacity & Performance Optimization

Module 3: Power BI

Ch 1: Power BI Intro, Installation

- ✓ **Power BI & Data Analysis**
- ✓ **Power BI Eco System**
- ✓ **Power BI Design Tools**
- ✓ **Power BI Installation**

Ch 2: Report Design Concepts

- ✓ **Basic Report Design (PBIX)**
- ✓ **Data Points, Spotlight**
- ✓ **Visual Interactions & Edits**
- ✓ **Focus Mode, PDF Exports**

Ch 3: Grouping, Hierarchies

- ✓ **Creating Groups: Lists**
- ✓ **Creating Groups: Bins**
- ✓ **Hierarchies & Drill-Downs**

- ✓ Drill Up, Conditional DrillDown

Ch 4: Slicer & Visual Sync

- ✓ Slicer Visual in Power BI
- ✓ Slicer: Format Options
- ✓ Single Select, Multi Select
- ✓ Slicer: Select All On / Off
- ✓ Visual Sync with Slicers

Ch 5: Filters & Drill Thru

- ✓ Power BI Filters
- ✓ Basic, Top & Advanced
- ✓ Visual Filters, Page Filters
- ✓ Report Level Filters, Clear Filter
- ✓ Drill Thru Filters & Usage

Ch 6: Bookmarks, Buttons

- ✓ Power BI Bookmarks
- ✓ Images: Actions, Bookmarks
- ✓ Buttons: Actions, Bookmarks
- ✓ Page to Page Navigations
- ✓ Score Cards, Master Pages

Ch 7: SQL DB Access & Big Data

- ✓ SQL DB Access, Queries
- ✓ Storage Modes: Direct Query
- ✓ Formatting & Date Time
- ✓ Storage Modes in Power BI
- ✓ Data Modeling & Formatting

Ch 8: Power BI Visualizations

- ✓ Charts, Bars, Lines, Area
- ✓ Tree Maps & Axis Items
- ✓ Funnel, Card, Mult-Row Card
- ✓ Pie Charts & Waterfall
- ✓ Scatter Chart, Play Axis
- ✓ Infographics, Classifications

Ch 9: Power Query Transformations - 1

- ✓ Power Query (Mashup)
- ✓ ETL Transformations in PBI
- ✓ Table Combine Options
- ✓ Merge, Union All Options
- ✓ Missing Values, Duplicate Records

- ✓ Wrong Data Types, Outliers
- ✓ Close, Apply & Visualize

Ch 10: Power Query Transformations - 2

- ✓ Group By Transformation
- ✓ Aggregate, Pivot Operation
- ✓ Reverse Rows, Count Rows
- ✓ Data Cleaning, Null Handling
- ✓ Data Type Detection, Change
- ✓ Rename, Replace, Move
- ✓ Fill Up, Fil Down

Ch 11: Power Query Transformations - 3

- ✓ String / Text Transformations
- ✓ Split, Merge, Extract, Format
- ✓ Numeric and Date Time
- ✓ Add Column & Expressions
- ✓ Column From Examples

Ch 12: Power Query Transformations - 4

- ✓ Parameters in Power Query
- ✓ Static Parameters, Defaults
- ✓ Dynamic Dropdowns, Lists
- ✓ Linking with Table Queries
- ✓ Step Edits, Type Conversions

Ch 13: Power BI Cloud & Fabric

- ✓ Power BI Cloud, Microsoft Fabric
- ✓ Microsoft Fabric Concepts
- ✓ Fabric One Lake (DWH, LH, etc.)
- ✓ Microsoft Fabric Workspace
- ✓ Power BI Desktop Connections
- ✓ Report Uploads (PBIX)
- ✓ Report Edits, Semantic Models

Ch 14: Power BI Cloud Dashboards

- ✓ Power BI Dashboards
- ✓ Dashboard Creation, Usage
- ✓ Pin Visuals, Pin LIVE Pages
- ✓ Add Image, Video Tiles
- ✓ Q&A & Pin Tiles

Ch 15: Power BI Cloud Operations

- ✓ Report Shares, Alerts

- ✓ Subscriptions, Exploration
- ✓ Downloads & Edits
- ✓ Report Cloning in Cloud
- ✓ QR Codes, Web Publish
- ✓ Lineage & Metrics

Ch 16: Power BI Cloud Gateways

- ✓ Data Gateways, Data Refresh
- ✓ Install, Configure Gateways
- ✓ Data Refresh & Scheduling
- ✓ Gateway Optimizations
- ✓ Incremental Refresh
- ✓ Large Dataset Optimization

Ch 17: Power BI Cloud Apps

- ✓ Power BI Apps: Creation
- ✓ App Sections & Content
- ✓ Audience & App Security
- ✓ App Updates, Favorites
- ✓ App URL, End User Access

Ch 18: Power BI Report Server, RDL

- ✓ Power BI Report Server
- ✓ RS Config Tool Options
- ✓ Report Database, TempDB
- ✓ Web Service & Server URL
- ✓ Report Builder Tool
- ✓ Paginated Report (RDL)
- ✓ RDL Report Publish

Ch 19: DAX Concepts & Calculations

- ✓ DAX Concepts: Intro & Realtime Need
- ✓ DAX Columns: Creation, Use
- ✓ DAX Measures: Creation, Use
- ✓ DAX Functions: IIF, ISBLANK
- ✓ SUM, CALCULATE Functions

Ch 20: DAX Quick Measures

- ✓ Quick Measures in Power BI
- ✓ Running Totals
- ✓ Star Rating Calculations
- ✓ DAX Measures in Data View
- ✓ DAX in Cloud Reports

Ch 21: Data Modelling

- ✓ Dimensions Tables
- ✓ Fact Tables & DAX Measures
- ✓ Data Models & DDAX Joins
- ✓ Star & Snowflake Schemas
- ✓ Many-to-Many Relationships
- ✓ Calculation Groups

Ch 22: DAX Joins, Variables

- ✓ CALCULATEX & Variables
- ✓ COUNT, COUNTA, etc..
- ✓ SUM, SUMX, etc..
- ✓ SELECTED MEMEBER
- ✓ Filter Context, RETURN

Ch 23: DAX Models & Calculations

- ✓ VAR, SWITCH, SUMMARIZE
- ✓ TREATAS, USERELATIONSHIP
- ✓ CROSSFILTER, GENERATE
- ✓ RANKX, TOPN, WINDOW
- ✓ OFFSET, INDEX

Ch 24: DAX Time Intelligence

- ✓ Need for Time Intelligence
- ✓ Date Table Generation
- ✓ Time Intelligence with DAX
- ✓ PARALLELPERIOD, DATE
- ✓ CALENDAR, Total Functions
- ✓ YTD, QTD, MTD with DAX

Ch 25: DAX - Row Level Security

- ✓ RLS: Row Level Security
- ✓ Data Modelling & Roles
- ✓ Add Cloud Users & KPIs
- ✓ CoPilot with DAX

Ch 26: DAX – Analytical Reports

- ✓ DAX with Excel
- ✓ Analytical Reports
- ✓ Virtual Cube Concepts
- ✓ Cross Filter Reporting
- ✓ Alerts, Data Activator

Ch 27: PL-300 Exam Guidance

- ✓ **PL 300 Exam Guidance**
- ✓ **Exam Samples**
- ✓ **Exam Scenarios**

Realtime Project: Enterprise Healthcare Data & Analytics Platform

Project Objective

Design and implement a modern Healthcare Data Platform using Power BI Analytics and Reporting services to process patient, hospital, clinical, and operational data for reporting, analytics, and decision-making.

Technologies Used

- ✓ **SQL Server**
- ✓ **MS Excel**
- ✓ **Parquet**
- ✓ **CSV**
- ✓ **PDF**
- ✓ **Azure**

Learning Outcomes

After completing this project, you can confidently showcase experience in:

- Power BI Reporting
- Power BI Data Analytics
- Business Process Understanding
- Performance Optimization
- End-to-End Power BI Implementation in Cloud

Career Guidance

- ✓ **ATS-Friendly Resume**
- ✓ **Resume Optimization**
- ✓ **Interview Strategy**
- ✓ **Job Search Platforms**

Thank You & Best Wishes!

"Your Data Engineering Journey Starts Today!"

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