

# SQL School <sup>TM</sup>

## Quality Training Assured

Complete Practical; Real-time Job Oriented Training

### Azure Data Engineer

	PLAN A	PLAN B	PLAN C
Applicable For (Resume Plan)	Azure Data Engineer	SQL & T-SQL Queries Azure Data Engineer	SQL & T-SQL Queries Azure Data Engineer Power BI
ADF : Azure Data Factory	✓	✓	✓
ADF : Data Imports, ETL	✓	✓	✓
ADF : Data Flows, Wrangling	✓	✓	✓
ADF : Transformations, ETL	✓	✓	✓
Synapse: Configuration, Loads	✓	✓	✓
Synapse: ETL with ADF, DWH	✓	✓	✓
Synapse: MPP, DWH, Tuning	✓	✓	✓
Storage: ADLS Gen 2, BLOB	✓	✓	✓
Storage: Azure Tables, ACL, IAM	✓	✓	✓
Azure Stream Analytics & Jobs	✓	✓	✓
IoT Hubs and Event Hubs, ETL	✓	✓	✓
ADB : Azure Data Bricks, Spark	✓	✓	✓
ADB : Spark Database, Data Loads	✓	✓	✓
ADB : SparkSQL, Jobs, Parameters	✓	✓	✓
ADB : Delta Tables, PySpark ETL	✓	✓	✓
DP 203 Exam Guidance	✓	✓	✓
TSQL: Database Basics, T-SQL	X	✓	✓
TSQL : Constraints, Joins, Queries	X	✓	✓
TSQL: Views, Group By, Self Joins	X	✓	✓
Power BI: Report Design, Visuals	X	X	✓
Power BI: M Lang, DAX for ETL	X	X	✓
Power BI: Cloud, Apps, Tenant	X	X	✓
Power BI: Report Server, Project	X	X	✓
DP 500, DA 100 Exams Guidance	X	X	✓
<b>Total Duration</b>	7 Weeks	8 Weeks	12 Weeks

**Trainer : Mr. Sai Phanindra T** [18+ Yrs of Real-time Exp]. Profile @ [linkedin.com/in/saiphanindra](https://www.linkedin.com/in/saiphanindra)

Training Module		Duration	Plan A	Plan B	Plan C
Module 1	<b>Azure Data Engineer (DP 203)</b> [Azure Funda, Azure Migrations, ADF, Synapse DWH, ADLS Storage, Spark SQL, Databricks, ASA, IoT, Real-time Project]	7 W	✓	✓	✓
Module 2	SQL Basics, T-SQL Queries	3 W	X	✓	✓
Module 3	<b>Power BI &amp; Big Data Analytics (DA 100)</b> [Power BI Cloud Service, Report Server, REST API, Dashboards, Power Query, DAX, Real-time Project, Resume Guide]	4 W	X	X	✓
<b>Total Duration</b>			<b>7 W</b>	<b>10 W</b>	<b>14 W</b>

## Module 1: Azure Data Engineer

### Part 1: Azure Data Factory [ADF], Synapse Analytics

#### Chapter 1: Cloud Basics, Azure SQL

Cloud Introduction and Azure Basics; Azure Implementation: IaaS, PaaS, SaaS; Azure Data Engineer: Job Roles; Azure Storage Components; Azure ETL & Streaming Components; Need for Azure Data Factory (ADF); Need for Azure Synapse Analytics; Azure Resources and Resource Types; Azure Account, Subscription (Free); Azure SQL Server [Logical Server]; Firewall Rules; Azure SQL Database & Azure SQL Pool Deployment; DTU Versus DWU; SSMS Connections;

#### Chapter 2: Synapse SQL Pools (DWH)

Dedicated SQL Pools in Azure; Data Warehouse with Synapse; Massively Parallel Processing (MPP); Control Nodes and Compute Nodes; DMS: Data Movement Service; Start/Resume/Pause & Scaling; SQL Pool Config @ TSQL Scripts; Start/Resume/Pause, Scaling Options; Table Creations @ TSQL Scripts; Table Partitions: Left & Right; Distributions: Round Robin, Hash; Distributions: Replicate and Usage; Auto Indexing & Column Store; Planning for Big Data Loads; Need for ADF: Azure Data Factory;

#### Chapter 3: Azure Data Factory, Pipelines

Azure Data Factory (ADF) Concepts; ADF Pipelines : Architecture; Integration Runtime (IR) & Use; Linked Services and Datasets; Pipeline Activities: Copy Data Tool; DIU : Data Integration Units; DTU Vs DWUs Vs DIU; ADF Pipeline with Copy Data Tool; Azure SQL DB to Synapse Data Loads; Multi Tables Data Loads with ADF; Bulk Insert, Data Copy Methods; ETL Staging: Storage Account; Staging Container Connections; DIU Allocations; ETL Pipeline Monitoring, Runs;

#### **Chapter 4: OnPremise Data Loads, Upsert**

Copy Data Tool : Incremental Loads; On-Premise Data Sources with Azure; Self Hosted Integration Runtime (IR); Access Keys, Remote Linked Service; Synapse SQL Pool (DW), OnPremise; ETL Staging with Storage Account; Copy Method: Polybase – Tuning; Polybase : Big Data Loads; ETL Pipelines for Incremental Loads; Business Keys For Table Upsert; Pipeline Schedules with ADF; ETL Logging with Storage Account; Copy Method: UPSERT; DIU, DOCP & Publish; Manual Pipeline Executions in ADF;

#### **Chapter 5: File Incremental Loads in ADF**

Incremental Loads with Files (BLOB); ETL Schedules: Tumbling Window; Execution Retry and Delay Options; Binary Copy, Structural Data Loads; Incremental Loads Verification Tests; Incompatible Rows & Fault Tolerance; Pipeline Compression & Tuning; Pipeline Publish, Monitor Options; Azure Monitor Resource : Metrics; ADF Metrics; Pipeline Monitoring; Synapse: Storage Monitoring, Alerts; Conditions, Signal Rules and Metrics; Alerts & Action Groups: Emails;

#### **Chapter 6: ADF Data Flow - 1**

Data Flow Task, Data Flow Activity; Transformations with Data Flow; Spark Cluster for Debugging; Cluster Node Configurations; Spark Cluster Types & Sizing; Transaction Optimized – Capacity; Memory Optimized – Capacity; Data Cleansing with ADF; Data Orchestration with Data Flow; SELECT Transformation; Conditional Split Transformation; UNION, SELECT Transformation; Spark Cluster For Pipeline Executions; Pipeline Monitoring & Run IDs; Adding Data Flow;

#### **Chapter 7: ADF Data Flow - 2**

ADF Pipelines For ETL Operations; Data Flow Tasks, Activities in Synapse; JOIN & EXISTS Transformations; Aggregate & Group By Transformations; Window Functions, Rank in Data Flow; Rank / DenseRank / Row Number; Derived Column Transformation; Lookup, Surrogate Key, Parse; Type Convert, Cast Transformations; Reusing Data Flow Tasks in Synapse; Pipeline Validations & Executions; Inline Datasets, Schema Drift; Data De-duplication with ADF; DFT Optimization Techniques; Data Flow Task - Staging, Logging;

#### **Chapter 8: Azure Synapse Analytics**

Azure Synapse Analytics Resource; Azure Synapse Analytics Workspace; Managed Resource Group, SQL Account; Synapse Workspace & Synapse Studio; Operations with Synapse Workspace; ADLS Gen 2 Storage Account, Container; Synapse Studio: Scripts & Pipelines; Dedicated SQL Pools : Creation, Use; Synapse Tables, Data Loads with TSQL; COPY INTO Statements with T-SQL; Row Terminator and Compression; T-SQL Queries and Aggregations; Aggregation Data Loads; Synapse Pipelines with TSQL; Stored Procedure Activity & Triggers;

#### **Chapter 9: Synapse Analytics with Spark**

Synapse Pipelines: Performance Advantage; Pivot Transformation For Normalization; Generate Pivot Column, Aggregations; Pivot Transformation & Pivot Setting; Pivot Key Selection, Value and Nulls; Pivoted Columns & Column Pattern; Column Prefix, Help Graphic, Metadata; Denormalized Data and Aggregations; Apache Spark Pool in Azure Synapse; Spark Cluster Nodes: Vcores,

Memory; Notebooks : Purpose, Usage Options; Python Notebooks; Databases in Apache Spark Pool; Data Loads from Dedicated SQL Pools; PySpark Code for Data Operations, Writes;

### **Chapter 10: Synapse Security & Parameters**

Azure Active Directory (AAD) Users, Groups; IAM: Identity & Access Management; Synapse Workspace Security with RBAC; ADF Security: RBAC, Owner, Contributor; Azure Synapse SQL Pool Security: Logins; Creating SQL Logins & Users : master; SQL Users in Azure SQL DB and SQL Pool; Grant, Control, Revoke: Security Roles; Parameters - Creation and Use in Pipelines; Dynamic Connections with Credentials; User Name and Password Connectivity; Dynamic Dataset Configurations; Pipeline Expressions with Parameters; Resource Classes;

### **Chapter 11: Change Data Capture (CDC)**

Change Data Capture (CDC) Data Loads; Incremental Loads with CDC Types; SQL Server CDC : ETL Load Dates; Pipeline Expression, Data Window; JSON Parameters, Pipeline Scheduling; ETL Optimization Techniques; Serverless Pool in Azure Synapse; Connections, Use with Serverless Pool; Using Azure OpenDatasets in Synapse; OPENROWSET and BULK Data Loads; Working with Parquet Files in Synapse; Python Notebooks (Pyspark) in Synapse;

## **Part 2 : Azure Data Lake Storage & Stream Analytics**

### **Chapter 1: Azure Fundamentals - Storage**

Azure Resources: Storage Components; Storage Resources and Properties; Resource Groups & Subscriptions; Azure Storage : Files, Tables and ETL; Azure Storage Account & Use; Data Lake Storage Account (ADLS); Advanced Options: HNS Property; Resource Location, Resource Group; Azure Portal: Deployment Verification; Azure Portal: Deployment Verification; Storage Account : Basic Properties; Overview Page: Status, HNS State; Azure Storage : Access Options; Azure Storage Explorer Tool; Explorer Tool : Configuration; Azure Subscription : Filter Options;

### **Chapter 2: Azure Storage Operations**

BLOB: Binary Large Objects; Storage Browser and Service Pages; Storage Browser: Container Creation; Storage Browser: Folder, File Uploads; Service Page: Container Creation; Service Page: Folder, File Uploads; Container, Folder, File Properties; Limitations with Storage Portal; Azure Data Explorer Tool : Usage; Contrainer: Creation, Properties; File Uploads, Edits and Access URLs; Azure Storage Explorer Tool Usage; Azure Account Options in Explorer; Directory Creation, File Operations; Limitations with Explorer Tool;

### **Chapter 3: Azure Storage Security, ACLs**

Azure Data Lake Storage Security Options; Shared Access Keys: Primary, Secondary; SAS Key Generation: Container, Tables; SAS Key Permissions, Validation Options; Access Keys: Account Level Permissions; Azure Active Directory: Users, Groups; Azure AD Security: RBAC, IAM, ACLs; Owner Role, Contributor, Reader Role; Azure Data Lake Storage Security; ACL : Access Control Lists & Security; Azure BLOB Storage Containers & ACLs; Folder Level and File Level Security;

ACL Permissions: Read, Write, Execute; Access Policy: Creation, Realtime Use; rwacdl; Azure Principals, CORS;

#### **Chapter 4: SQL Database Migrations**

OnPremise SQL Server to Azure Migration; SSMS Tool, SQL Database Installation; SourceDatabase Scripts & Validations; BACPAC File Generation: SSMS Tool; Table Selection & Advanced Options; Azure Data Lake Storage, SSMS Access; Azure Storage Container, BACPAC Files; IAM and Account Key Authentication; Azure SQL Server Creation From Portal; Azure SQL Database Deployment; DTU : Data Transaction Units, Pricing; Azure Firewall Configuration, Security; Azure SQL Database Imports (bacpac); Azure SQL Server with ADLS Containers; Azure SQL DB Migrations, Verification;

#### **Chapter 5: Azure Tables & Replication**

Azure Tables - SchemaLess Design; Azure Tables: Creation, Data Inserts; Tables, Entities, Properties Concepts; Structured, Relational Data Storage; Azure Tables: GUI, Data Types; Azure Tables: Big Data Imports; Data Edits, Queries, Delete Operations; Odata Options (REST API), End Points; Azure Storage: Replications, DR Options; LRS: Locally Redundant Storage; GRS: Globally Redundant Storage; ZRS: Zone Redundant Storage; Replication Options and Advantages; Replication Verification, Modifications; Storage Endpoints, Failover Partner;

#### **Chapter 6: Azure Stream Analytics, IoT**

Azure Stream Analytics; Real-time Data Processing, Events; Ingest, Deliver & Analysis Operations; Azure Stream Analytics Jobs Concept; Understanding Input, Output Options; SAQL Queries: Stream Analytics Jobs; IoT: Internet of Things, Real-time Data; Need for IoT Hubs and Event Hubs; Conditional Split Transformation; IoT Device for Data Inputs; Creating Azure Stream Analytics Job; Stream Analytics for Historical Data; Azure SQL Database for ASA Jobs; SAQL: Query Formatting; Historical Data Upload, ASA Jobs; Stream Analytics Job Monitoring;

#### **Chapter 7: Azure Event Hubs**

Azure Stream Analytics For API Data; ;IoT Hubs, IoT Devices, Connection Strings; Raspberry APP Connections with IoT Hub; Azure Storage Account and Container; Creating Azure Stream Analytics Job; Configuring Input Aliases with IoT Hub; Output Aliases with ADLS Gen 2; SAQL Query, Job Executions; Monitoring; Azure Event Hubs and Event Instances; Event Hub Namespaces, Partition Counts; Access Policies, Permissions & Defaults; RootManageSharedAccessKey & Options; Connection Strings & Event Service Bus; Telco App : Executions & LIVE Data; On-Premise App Integration, ASA Jobs;

#### **Chapter 8: Storage Architecture, Queues**

Azure Storage Account : Architecture; Etag: Replication & Encryption Use; BLOB Types: Block, Append & Page; Access Tiers: Hot, Cool, Cold Types; Archive Access Tier & Retention; Legal Hold & Time Bound Access; Pricing : HNS, Security, Encryption; EndPoint URL & Read-Only Use; Azure File Share Service (Files); Mounting Files From On-Premise; SMB File Share : Hot, Optimized; Azure

Queue Service & Messages; Message Queues : Operations; Storage Explorer Tool with Shares; Azure Storage Services: ETL Needs;

### **Chapter 9: Monitoring & Key Vaults**

Azure Monitor, Metrics & Activity Logs; Monitoring Azure Storage Namespaces; Add KQL Metrics; Account, Blob and File; Total Ingress and Egress Metrics: Charts; Average Latency, Transaction Count; Request Breakdowns, Signal Logic; Azure Alerts & Conditions, Notifications; Signal Logic Conditions and Emails; Key Vaults Types: Standard & Premium; Secret Page, Key Backups, Key Restores; Azure Key Vaults - Name and Vault URI; Inbuilt Managed Key and Azure Key Vault; Key Vaults Types: Standard & Premium; Secret Page, Key Backups, Key Restores; Managed Identity with ETL Process;

## **Part 3: Azure Databricks & Spark, Python**

### **Chapter 1: Azure Intro, Azure Databricks**

Azure Cloud : SaaS, PaaS, PaaS & IaaS; Azure Cloud : Storage, ETL Resources; Azure Databricks : Compute Resources; Need for Azure Databricks (ADB); Azure Databricks : Purpose & Config; ;Azure Databricks Service Creation; Azure Databricks Component; Azure Databricks Workspace, Usage; Spark Cluster Configurations, Capacity; Driver Nodes, Worker Nodes in Spark; Cluster Types : Personal, Unrestricted; CPU, Memory & IO Resources; Virtual Machines (VM) for Clusters; Databricks : Runtime & DBFS Storage; DBFS : Files, Tables with Spark DB;

### **Chapter 2: SparkDatabase, SQL Notebooks**

DBFS : File Uploads from ON-Premise; Creating Spark Tables; Spark DB; Data Explorer: HIVE Metastore; Data Explorer: Spark Database, Tables; Notebooks: SQL, Python and Scala; Creating SQL Notebooks in Databricks; Creating User Defined Spark Databases; Connecting / Using Spark Databases; Spark SQL : Big Data Loads; Spark SQL : Database & Table List; Spark SQL : Data Aggregations, Jobs; Spark SQL : Data Analytics, Reports; Analytics: X, Y Axis, Group By; Notebooks : Export, Import, Clone; Notebooks : Storage & Versions;

### **Chapter 3: Python Intro, Data Loads**

Python : Introduction, Real-time Use; Python For ETL and DWH; Python For Azure: Data Engineer; Python Data Frames & Purpose; Python Dataframes – Pandas; Python with Spark Integrations; PySpark for DDL and ETL; PySpark Versus SQL Notebooks; Reading DBFS Data into Spark; Creating Dataframes for ETL; Temporary Views & Dataframes; Spark Temp Views: Aggregations; Spark Table Loads, HIVE Data; dataframe.write.format(); Spark Parquet Tables;

### **Chapter 4: PySpark with ADLS**

Azure Storage Account : Creation; Azure Data Lake Storage : HNS; Creating Containers in ADLS; BLOB File Uploads / Generation; Account Key : Access Key / SAS Key; BLOB Access URL for Databricks; WASBS URL for PySpark Notebook; Generating PySpark Script; PySpark Connection Variables; Databricks : Data Import Scripts; Config Options with ADLS, Spark; spark.config (), Session Context; DataFrames with Temp Tables; Escape Sequence ; HIVE & Spark DB;



### **Chapter 5: PySpark Widgets & Spark**

Widgets : Notebook Parameters; dbutils.widget module : Text, Combo; Dropdown, Multi Select Parameters; dbutils help(), get() & remove(); Dataframes, Spark SQL @ Variables; Python Data Frames, Spark SQL; Reading Parameters Values; Parameters Versus Variables; Using Parameters For Temp Tables; Using Parameters for Spark Tables; Data Storage and HIVE Metastore; Reading Parameterized Data; Format Strings with PySpark; Dynamic Queries with Spark SQL; Aggregations and f Strings;

### **Chapter 6: Architecture, Workflows**

Driver Nodes, Worker Nodes, DBUs; RDD : Resilient Data Distribution; DAG : Directed Acyclic Graph; Hadoop HDES and Spot Instance; Cluster Manager, Master Node; RDDS, Worker, Executor & Slave; Hadoop HDES & Databricks Runtime; Databricks Optimization Techniques; Spot Instance, Photon Acceleration; All Purpose Cluster, Job Cluster; Databricks Jobs: Creation & Tasks; Jobs with Parameters, Executions; Task Dependency & Notifications; Continuous & Manual Schedules; Active Jobs, Recent Run Jobs, Monitor;

### **Chapter 7: Databricks Security, Scala**

Azure Databricks Security Operations; Azure Active Directory (Azure AD); AD Users and RBAC with IAM; Owner, Contributor & Reader Roles; Workspace Admin Permissions; Notebook Permissions & Share; Workflow Security, HTTP Path; User Tokens & ServerName; Scala : Differences with PySpark; Scala : Variables Declaration, Usage; SparkSQL with Scala Notebooks; Temp Views with Scala Notebooks; Aggregations with Scala Notebooks; Visual Data Analytics with Scala; PySpark to Scala Conversions;

### **Chapter 8: Scala with ADLS, Azure SQL**

Data Imports with Azure SQL DB; Using Scala for Big Data Loads; Spark SQL Queries @ Temp Views; Variables, display(), spark.read(); Scala Transformations, display(); JSON, AVRO and DBFS Mounts; fs.azure.sas.container @ ADLS; dataframe.write.jdbc() & JVM; JDBC Connection, DataframeWriter; Data Extraction, SQLContext; Spark Context and Spark Session; SQLServerDriver with Scala; ADLS with Scala Notebooks; ;Parameters (Widgets) with Scala;

### **Chapter 9: DeltaLake Incr Loads, DWH**

Azure DeltaLake Implementation; ACID Properties, Upsert Advantages; Delta Engine Optimizations & Uses; Pipeline Creation: JSON Files in DBFS; Delta Tables Creation, Data Loads; Spark Cluster Settings: Auto Optimize; Auto Compact, Delta Table Optimize; JSON Files, Delta Streaming Location; Joins and Merge with Delta Tables; Incremental Loads, Delta Tables; Create & Use DWH with Databricks; Upsert (Merge) with Spark Tables; Big Data & Jupyter Notebooks; Databricks with Data Factory (ADF); End to End Implementations;

### **Real-time Project (End to End)**

Online Retail / Travel Database Data Source; Azure Migrations and ETL Concepts; Azure SQL Pool (Synapse DWH) Tables; Apache Spark Pool: Databases, Tables; Azure Data Lake Storage (ADLS Gen 2); Handling Unstructured Data in ADF; End to End Workflows, Automations; Azure Logic Apps: Automated Workflows; Visual Designer & Prebuild Templates; Server Less Integrations in Azure; Workflow, Triggers and Actions; Managed Connectors, Integrations; ARM Template: Deployments; ARM Templates: ADF, ADLS; ADLS with Spark Databases; Aggregations with Big Data Loads; Parameterized ETL Sources; Parameterization & Workflows; Python Notebooks to Scala; Azure SQL DB Connections; ARM Templates & JSON; Project Requirement; Project Solution, FAQs; Concept wise FAQs; Resume Guidance; Mock Interviews (1 to 1); DP 203 Certification Guidance; DP 203 Sample Papers (Latest);

### Azure Data Engineering with Power BI (For Power BI Registrations)

Power BI with Synapse SQL Pool; Power BI with Synapse Analytics; Get Data: Storage Modes; Direct Query, Performance Inspector; Aggregated Data Analytics; Data Gateways: Auto Refresh; Power BI with ADLS: Record Query; Power BI with ADLS: BLOB Data; Power BI with Spark DB: JDBC; Power BI with Spark DB : User Tken; Power BI with Spark DB : LIVE Data; Power BI with Spark DB: Refresh;

Azure Purview: Data Governance; Unified SaaS for Multi Cloud; Data Mapping and Resilience; Automated Data Discovery; Sensitive Data Labels : SQL Server; Interactive Data Lineage; Trusted DataDiscovery in Azure; Confidential Data & Trust; DataCatalog, Data Estate Insights; Azure Key Vaults, ADLS Security; Azure Passwords, Keys, Certificates; Azure Key Vaults - Name, Vault URI; Managed Key & ETL Connections;

## Module 2: Database Basics, SQL, T-SQL Queries

Applicable for **Azure Data Engineer** Plans B, C

### Chapter 1: DATABASE INTRODUCTION

Databases Introduction & Purpose; Database Types : OLTP, DWH, OLAP; Microsoft SQL Server Advantages, Use; SQL Server Components and Usage; Microsoft SQL Server - Career Options; Developer, DBA, Data Engineer; Data Analyst, Data Scientist Careers; SQL : Purpose, Real-time Usage Options; SQL Versus Microsoft T-SQL [MSSQL]; Course Plan, Real-time Project, Resume; 24 x 7 Online Lab for Remote DB Access; Versions and Editions of SQL Server; SQL Server Pre-requisites : S/W, H/W; System Configuration Checker Tool;

### Chapter 2: SQL SERVER INSTALLATIONS

SQL Server & SSMS Installation Plan; SQL Server Pre-requisites : S/W, H/W; SQL Server 2022 & 2019 Installation; Database Engine Feature, OLTP; Instances : Types and Properties; Default Instance, Named Instances; Service and Service Account Use; Authentication Modes and Logins; Windows Logins and SQL Logins; SQL Server Management Studio; Server Connections with SSMS Tool; Local and Remote Connections; System Databases: Master and Model; MSDB, TempDB, Resource Databases;

### Chapter 3: SSMS Tool, SQL BASICS - 1



Creating Databases: Files [MDF, LDF]; Creating Tables in User Interface; Data Insertion & Report in User Interface; SQL : Purpose and Real-time Usage; SQL Versus T-SQL : Basic Differences; DDL, DML, SELECT, DCL and TCL; Creating SSMS Sessions : SPID; Create, Connect Databases using SQL; Creating Tables with INT, CHAR; Data Storage, Inserts - Basic Level; Table Data Verifications with Select; SELECT Statement for Table Retrieval; Identify Databases and Tables; Identify Sessions and Session ID;

### **Chapter 4: SQL BASICS - 2**

Creating Tables: VARCHAR, FLOAT; Single Row Inserts, Multi Row Inserts; Rules for Data Insertion Statements; SELECT with WHERE Conditions; AND and OR Operators Usage; IN Operator and NOT IN Operator; Between, Not Between Operators; LIKE and NOT LIKE Operators; ORDER BY, TOP & OFFSET; Basic Sub Queries with SELECT; UPDATE Statement & Conditions; DELETE & TRUNCATE Statements; ALTER, ADD COLUMN Statements; DROP Statements: Table, Database;

### **Chapter 5: SQL BASICS - 3, T-SQL Introduction**

Database Objects : Tables and Schemas; Schemas : Group Tables in Database; Schemas : Security Management Object; Creating Schemas & Batch Concept; Using Schemas for Table Creation; Data Storage in Tables with Schemas; Data Retrieval & Usage with Schemas; Table Migrations across Schemas; Import and Export Wizard in SSMS; Data Imports with Excel File Data; Performing Bulk Operations in SSMS; Temporary Tables : Real-time Use; Local and Global Temporary Tables; # and ## Prefix, Scope of Usage;

### **Chapter 6: CONSTRAINTS & INDEXES BASICS**

Constraints and Keys - Data Integrity; NULL, NOT NULL Property on Tables; UNIQUE KEY Constraints: Importance; PRIMARY KEY Constraint: Importance; FOREIGN KEY Constraint: Importance; REFERENCES, CHECK & DEFAULT; Candidate Keys and Identity Property; Database Diagrams and ER Models; Relationships Verification and Links; Indexes : Basic Types and Creation; Index Sorting and Search Advantages; Clustered and NonClustered Indexes; Primary Key and Unique Key Indexes; Need for Indexes - working with Keys;

### **Case Study 1: Database Design with Tables, Constraints, Keys & Relations**

### **Chapter 7: JOINS and TSQL Queries**

JOINS - Table Comparisons Queries; INNER JOINS For Matching Data; OUTER JOINS For (non) Match Data; Join Queries with "ON" Conditions; Left Outer Joins - Example Queries; Right Outer Joins - Example Queries; FULL Outer Joins: Realtime Scenarios; CROSS JOIN and CROSS APPLY; One-way, Two way Data Comparisons; Using Table Aliases & Column Aliases; Optimizing Join Queries with Indexes; Choosing Correct Comparison Columns; Joining Unrelated Tables in TSQL; Self References, Self Joins in TSQL;

### **Chapter 8: GROUP BY in T-SQL, Views Basics**

GROUP BY: Importance, Realtime Use; GROUP BY Queries and Aggregations; Group By Queries with Having Clause; Group By Queries with Where Clause; Using WHERE and HAVING in T-SQL;

Group By with Joins in TSQL; Query Execution Order & Aliases; Joins with Sub Queries, Formatting; Database Objects: Overview & Usage; Views: Types, Usage in Real-time; Creating, Executing & Verifying Views; Storing Queries in Database Views; Excel Analytics - Joins & Views; Excel Office Data Connection Reports;

### **Chapter 9: Functions, Procedures Basics**

Functions with SQL Server, TSQL; Scalar, Inline, Table Functions; Variables: Declare, Real-time Use; Creating, Executing Functions; Functions for Computations; Functions for Parameterized Joins; Procedures: Usage in Real-time; Using Parameters in SQL Server; Parameterized Joins in TSQL; Compilation with Stored Procedures; sp\_help, sp\_helptext, sp\_helpindex; sp\_helpdb, sp\_rename, sp\_recompile; System Views & Metadata Audits;

### **Chapter 10: TRIGGERS & TRANSACTIONS**

Triggers - Purpose, Real-world Usage; FOR/AFTER Triggers - Real time Use; INSTEAD OF Triggers - Real time Use; INSERTED, DELETED Memory Tables; Using Triggers for Data Replication; Enable Triggers and Disable Triggers; Database Level, Server Level Triggers; Transactions : Types, ACID Properties; Transaction Types and AutoCommit; EXPLICIT & IMPLICIT Transactions; COMMIT and ROLLBACK Statements; Batch Concept and Go Statement; Open Transactions in Real-time; Using Conditional Commits, Rollbacks;

### **Chapter 11: Normal Forms, Cursors**

First Normal Form and Atomicity; Third Normal Form and MVD Property; Boycee-Codd Normal Form : BNCF; Fourth Normal Form : Advantages; Self Reference Keys and 4 NF Usage; 1:1, 1:M, M:1, M:M Relationship Types; Linked Servers Configurations, RPC; Linked Servers, Remote Joins in TSQL; 2 Part, 3 Part, 4 Part Naming Styles; Remote Joins Queries and Aliases; Cursors - Basics, Data Operations; Cursors - Life Cycle & Declaration; Cursors Types, FETCH Operations; Cursors - Deallocate, Real-world Use;

### **Chapter 12: TSQL Queries, SQL Analytics**

IIF() Function with SELECT Query; CASE. WHEN..THEN..ELSE; WHEN MATCHED, NOT MATCHED; Incremental Loads, Upsert Statement; Stored Procedures: Merge Statement; UNION and UNION ALL Operator; Window Functions: Rank, Dense Rank; Row\_Number, PartitionBy in TSQL; Duplicate Row Identification, Deletion; Grouping, Cube, Rollup, Lag, Lead; Data Types: Numerical, Date, Time; Data Types: Characters, Real, Float; Date & Time Functions, DateAdd; String Functions, Concat, SubString;

### **Case Study 2: Joins with Group By, Sub Queries, Views, Excel Analytics**

## **Module 3: Power BI (Reports, Cloud, Server, Analytics)**

Applicable for **Azure Data Engineer Plan C**

### **Chapter 1 : POWER BI INTRODUCTION**

Power BI : Introduction to Analytics; Power BI Tools Suite, Advantages; Power BI : Career Options, Plan; Power BI Developer Job Role; Microsoft Data Analyst Job Role; Big Data Analyst

Job Role; Power BI Data Analyst (PL 300); ;Data Engineer\*, Power BI (DP 500 \*); Artificial Intelligence (AI) Visuals; AI Enabled Power BI Features; Course - Lab Plan with Design Tools; Need for Power Query & DAX; Power BI Licensing Types; Power BI – Advantages;

## **Chapter 2 : BASIC REPORT DESIGN**

Power BI Eco System: Architecture; Data Sources & Types in Real-world; Report Types: Interactive, Paginated; Analytical Reports & Mobile Reports; Data Sources : File, Database, Web; Visualizations : Report Shapes; Power BI Design Tools, Requirements; Power BI Desktop Tool : Installation; Desktop Interface: Canvas; Data View, Report View; In-Memory Xvelocity Database; Labels, Legend, Category; Local Store: PBIX & PBIT Files; Data Points and Tooltips;

## **Chapter 3 : Visual Interaction, Visual Sync**

Visual Interaction with Data Points; Disabling / Enabling Interactions; Edit Interactions: Format Options; Spotlight and Focus Mode; Report Export to CSV, PDF; Tooltip Options and Usage; Working with Pages in PBI; Rename, Duplicate, Hide Pages; Slicer Visual : Real-time Usage; Orientation, Selection Properties; Slicer Settings : Tiles & Slider; Single & Multi Select, Header; Number, Text, Show Summary; Date Slicer and Value Selections; Slicer List, Dropdowns & Clear; Visual Sync Limitations with Slicer;

## **Chapter 4 : Grouping & Hierarchies**

Grouping : Visuals with Pdf Sources; List Grouping and Binning Options; Grouping Static / Fixed Data Values; Grouping Dynamic / Changing Data; Bin Size and Bin Limits (Max, Min); Bin Count and Grouping Options; Group with Bins & Clustering; Group, Layer with Selection Pane; Creating Hierarchies in Power BI; Independent, Dependant Drill-Down; Drill-Down with Interactive Reports; Conditional Drilldowns, Data Points; Drill Up Buttons and Operations; Expand & Show Next Level; Dynamic Data Drills Limitations;

## **Chapter 5 : Filters & Bookmarks**

Filters : Types and Usage in Real-time; Visual Filter, Page Filter, Report Filter; Basic, Advanced and TOP N Filters; Category and Summary Level Filters; Data / Drill Options, DrillThru Filters; Keep All Filters" Options in DrillThru; CrossReport Filters, Include, Exclude; Drill-thru Filters, Page Navigations; Bookmarks : Report Navigations; Buttons, Images with Actions; Selection Pane, Actions, Text URLs; Show Data and See Records; Custom Tooltips, Table Visual; Table Vs Matrix : Drill-downs; Styles, Cell Properties, Databars; Conditional Formatting, Divergent;

## **Chapter 6 : Big Data Access, Visuals**

OLTP Databases, Big Data Sources; Azure Database Access, Reports; Import, Direct Query & Dual Mode; Data Modeling: Do Not Summarize; Data Modeling: Currency, Relations; Power BI Archtiecture, Eco System; Power BI Interface for Reports; Stacked Chart, Clustered Chart; Line Chart, Area Chart, Bar Chart; 100% Stacked Bar & Column Chart; Map Visuals: Tree, Filled, Bubble; Small Multiples, Legends, Axis; Cards, Funnel, Table, Matrix; Scatter Chart : Play Axis, Labels; Waterfall Chart, Multi Row Cards;

## **Chapter 7 : POWER QUERY LEVEL 1**

Power Query M Language Purpose; Power Query Architecture and ETL; Data Types, Literals and Values; Power Query Transformation Types; Table & Column Transformations; Text & Number Transformations; Date, Time and Structured Data; let, source, in statements @ M Lang; Get Data, Table Creations and Edit; ETL Operations with Power Query; Merge Transformations in Power BI; Join Kinds: Inner, Outer & Apply; Union All Transformation & Appends; Power Query Editor, Step Edits; Close & Apply Options. Report Design;

### **Chapter 8 : POWER QUERY LEVEL 2**

Query Duplicate, Query Reference; Group By and Advanced Options; Aggregations with Power Query; Transpose, Header Promotion; Reverse Rows and Row Count; Data Type Changes & Detection; Replace Columns: Text, NonText; Advanced Query Edit Options; Replace Nulls: Fill Up, Fill Down; Pivot, Unpivot Transformations; Move Column and Split Column; Extract, Format and Numbers; Date & Time Transformations; Derive Year, Quarter, Month, Day; Add Column : Query Expressions; Query Step Inserts and Step Edits;

### **Chapter 9 : POWER QUERY LEVEL 3**

Big Data Loads : Parameter Queries; Creating Parameters in Power Query; Parameter Data Types, Default Lists; Static & Dynamic Lists: List Queries; Convert Tables to Lists, Use Cases; Linking Parameters to Queries; Testing Parameters with Canvas; Multi-Valued Parameter Lists; Creating Lists in Power Query; Converting Lists to Table Data; Invoke Function, Type Conversions; Function Query & Parameter List; Columns From Examples, Indexes; Conditional Columns, Expressions; Disable / Enable Data Loads;

### **Chapter 10: POWER BI CLOUD - 1**

Power BI Cloud Components; App Workspaces, Report Publish; Reports & Related Datasets Cloud; Creating New Reports in Cloud; Report Publish, Report Uploads; Report Edits and New Reports; Report Actions: Downloads; Dataset Usage Options in Cloud; Dashboards Creation and Usage; Pining Visuals and Report Pages; Visual Pin Actions in Dashboards; Dashboard & LIVE Interactions; Media Tiles: Images, Custom Links; Q & A; Pin with Q & A; Standard Visuals;

### **Chapter 11 : POWER BI CLOUD - 2**

Report Actions : Share, Subscribe; Report Actions : Lineage, Embed; Report Actions : Export Options; Report Actions : Public User Access; Dashboard Actions : Share, Subscribe; Dashboard Actions : Themes, Lineage; Dashboard Actions : Share, Subscribe; Favorite, Insights, Embed Code; Gateways Configuration, PBI Service; Gateway Types, Cloud Connections; Gateway Cluster, Add Data Sources; Data Refresh : Manual, Scheduled; Power Query Parameters, Gateways; DataFlows; Lineage, Share, Subscribe, Insights; Performance Inspector& Gateways;

### **Chapter 12 : POWER BI CLOUD - 3**

Workbooks : Excel Online & Pins; Power BI Apps: Creation & Usage; Power BI Segments, Content; Navigation Screens, Audience; App Publish, Verification & Edits; Export, Share & Subscribe; List & Lineage; Power BI Scorecards; Paginated Reports - Design & Usage; Power BI

Report Builder Tool; Microsoft Report Builder Tool; Report Builder : Datasets, Charts; Report Builder : Bar Charts, Fields; Report Builder : RDL Files; Paginated Reports : Deployments;

### **Chapter 13 : DAX Functions - Level 1**

DAX : Importance in Real-time; DAX Data Types, Syntax Rules; DAX Measures and Columns; ROW Context and Filter Context; Operators, Special Characters; DAX Functions, Vertipaq Engine; DAX Cheat Sheet : Expressions; Data Analytics with DAX; DAX Measures : Expressions; ISBLANK, IF, IN, SUM; SUMX, AVG, AVERAGEX; Data Models: Fact, Dimensions; Detecting Relations for DAX; Star & Snowflake Schemas; Data Modeling Options in DAX;

### **Chapter 14 : DAX Functions - Level 2**

Quick Measures in Power BI; Average and Filtered Average; Running Totals, EARLIER( ); RELATED, COUNTROWS CALCULATE Function Conditions; ALL Members Scope & IN; Account and Time Calculations; Star Rating, DAX Expressions; Data Modeling Options in DAX; 1:1, 1:M and M:1 Relations; Working with Facts & Measures; Modeling : Missing Relations; Relationships & Importance; Modeling : Relation Management; Modeling with Multiple Keys;

### **Chapter 15 : DAX Functions - Level 3**

DAX : Variables and Expressions; Dynamic Expressions, RETURN; Current Value, Previous Value; SELECTED VALUE, Joins; FORMAT Function with DAX; RELATED, Joins in DAX; DAX Expressions with SQL DB; Time Intelligence Functions; Date Dimension : Generation; CALENDAR(), DATESYTD(); TOTALYTD, TOTALQTD; TODAY, DATE, DAY with DAX; SELECTEDVALUE, FORMAT; Date, Time and Text Functions;

### **Chapter 16: DAX Functions - Level 4**

RLS: Row Level Security; Data Models in Power BI Desktop; DAX Roles Creation and Testing; DAX Expressions & Operators; PBIX Uploads: Power BI Cloud; Dataset Security with DAX Roles; Entity Sets and Slicing in DAX; Dataflows with Power BI; Analytical Reports - DAX Usage; Creating Data Models with DAX; Datasets in Excel and Dashboards; Using Excel Analyzer in Power BI; Power BI Data Source in Excel; Connection Strings and Refresh; Analytical Reports;

### **Chapter 17: Power BI Report Server**

Power BI Report Server Config; SQL Server Instance Verifications; Report Server DB, Temp Database; WebService & WebPortal URL; Uploading Interactive Reports; End User Report Share (pdf); Power BI Desktop RS Tool; Interactive Reports: Report Server; Mobile Reports : Design Options; Mobile Reports : Grids, Elements; Mobile Reports : Uploads, Edits; Paginated Reports : Deployments; Paginated Vs Interactive Reports; Paginated Vs Analytical Reports; Paginated Vs Mobile Reports; Power BI Report Server Vs Cloud;

### **Chapter 18 : Power BI Admin & AI**

Power BI Cloud Management; Power BI Admin : Alerts; Workspace Management, Users; Security: Report, Dataset Levels; Security: Dataset, App Levels; Security: Workspace Options; PBI Performance Inspector; Power BI & Artificial Intelligence; Power BI & CoPilot Add-Ins; AI

Visuals & Big Data Analytics; Smart Narrative and Q & A; Infographics, Icons and Labels; Key Influencer Visual in Power BI; Metrics Visual, Performance; Paginated Reports Visual;

## Chapter 18: Real-time Project [Sales & Customers]

### Phase 1 : Basic Report Design

Project Requirement Analysis; Requirement Gathering, FSA; Report Design with Excel; Basic Data Modelling; Infographics, Histograms; Analytics and Formatting;

### Phase 2: SME Level

Report Design with SQL DB; SQL Database: Joins, Views; ;Dual Storage Mode, SQL Queries; Data Modeling, Power Query; Dynamic Connections, Azure DB; Parameters and M Lang Scripts;

### Phase 3: Deployments (Cloud, Server)

DAX Requirements, Analysis; Cloud and Report Server; Custom Visualizations; 3party Visuals & REST API \*; Project FAQs and Solutions; One - One Resume, Mock Interview;

## Resume, Project Oriented FAQs and Solutions

1 Database, SQL Server Basics & TSQL Queries 1											
2 TSQL Programming		<b>5 Azure Data Engineer</b> Azure Fundamentals, Azure SQL, ETL, Datawarehouse Azure Data Factory, Synapse Analytics, SQL Pool, IAM Azure Storage, ADLS, Key Vault, Stream Analytics Job IoT, Hubs, Event Hubs, Azure Databricks, Spark SQL Python, PySpark, Scala, DeltaLake, Big Data Analytics					<b>6 Power BI</b>			9 SQL DBA On-Premise (Non Cloud)	
3 Query Tuning										10 Azure SQL DBA	
4 Azure SQL Developer										5 Azure Data Engineer ETL Admin	
<b>7 Microsoft Fabric</b> Microsoft Fabric, SaaS Implementation, Synapse Engineering, Fabric Data Wrangler, Lakehouse Autonomous ETL, Synapse IoT, OneLake, Data Exploration, Data Activator, Universal Security Azure Purview, Big Data Clusters, PySpark, Power BI Integrations, Data Hub, AI Analytics Azure BI (8)											
<b>TSQL Training Plans</b> Plan A 1, 2 4 W Plan B 1, 2, 3 5 W Plan C 1, 2, 3, 4 7 W		<b>Azure Data Engineer Plans</b> Plan A 5 7 W Plan B 1, 5 10 W Plan C 1, 5, 6 14 W			<b>Power BI Training Plans</b> Plan A 6 4 W Plan B 1, 6 7 W Plan C 1, 6, 5 14 W		<b>Microsoft Fabric</b> Plan A 7 4 W Plan B 5, 6, 7 15 W Plan C 1, 5, 6, 7 18 W		<b>SQL DBA Training Plans</b> Plan A 1, 9 6 W Plan B 1, 9, 10 9 W Plan C 1, 9, 10, 5 16 W		
Other Courses: MSBI, Power Apps, Azure DevOps, Azure SSIS, SSAS, Snowflake						Call: +91 9666 44 0801		www.sqlschool.com			

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