

Snowflake Advanced Course Curriculum

1. Introduction to Snowflake

- Overview of Snowflake Architecture
- Snowflake Multi-Cluster Shared Data Architecture
- Key Concepts: Virtual Warehouses, Databases, Schemas, and Tables
- Snowflake Editions: Standard, Enterprise, Business Critical, and VPS

2. Snowflake Data Warehousing

- Data Storage and Compression Techniques
- Micro-partitioning and Columnar Storage
- Time Travel and Data Retention Strategies
- Zero-Copy Cloning: Creating Test and Development Environments
- Data Sharing: Secure and Cross-Account Data Sharing

3. Data Loading & Unloading

- Loading Data using COPY INTO Command
- Using Snowpipe for Continuous Data Ingestion
- Bulk Data Loading: Best Practices
- Data Unloading to External Stages (S3, Azure Blob, GCS)
- Handling Semi-Structured Data (JSON, Avro, Parquet)

4. Virtual Warehouses & Performance Tuning

- Virtual Warehouse Sizing & Scaling
- Query Performance Optimization Techniques
- Result Caching & Query Reuse
- Query Profiling and Performance Metrics
- Managing Concurrency and Workload Isolation

5. Security & Access Control

- Role-Based Access Control (RBAC) & Privilege Management
- Network Security: IP Whitelisting & Network Policies
- Data Encryption: In-Transit and At-Rest
- Managing and Auditing Access with Snowflake Account Usage
- Using Snowflake's Security Features: MFA, SSO, OAuth

6. Data Modeling in Snowflake

- Dimensional Modeling: Star and Snowflake Schemas
- Data Vault Modeling
- Handling Slowly Changing Dimensions (SCD)
- Working with Fact and Dimension Tables
- Schema Design Best Practices

7. Advanced SQL in Snowflake

- Window Functions and Analytical Queries
- Common Table Expressions (CTEs) and Recursive Queries
- Advanced Joins, Subqueries, and Set Operations

- User-Defined Functions (UDFs) and Stored Procedures
- Query Optimization and Execution Plans

8. Data Integration & ETL/ELT

- Snowflake with ETL Tools (Informatica, Talend, Matillion)
- Building ELT Pipelines with Snowflake and SQL
- Data Transformation with Snowflake Streams and Tasks
- Continuous Data Integration with Snowpipe and Event-Based Ingestion
- Integrating Snowflake with Apache Kafka for Real-Time Data

9. Advanced Features

- Materialized Views: Design and Usage
- Working with External Tables
- Data Masking & Tokenization for Privacy
- Semi-Structured Data Handling: VARIANT, OBJECT, ARRAY
- Geospatial Data Handling in Snowflake

10. Data Sharing & Collaboration

- Secure Data Sharing: Concepts and Implementation
- Reader Accounts: Sharing Data with Non-Snowflake Users
- Data Marketplace: Publishing and Subscribing to Data
- Managing Data Shares across Multiple Accounts
- Real-Time Data Sharing Scenarios

11. Snowflake Integration with BI Tools

- Connecting Snowflake to Tableau, Power BI, Looker
- Performance Tuning for BI Tools Integration
- Real-Time Analytics with Snowflake and BI Tools
- Advanced Data Visualization Techniques
- Best Practices for BI Integration

12. Data Governance & Compliance

- Data Lineage Tracking and Auditing
- Implementing Data Quality Checks
- Compliance with GDPR, HIPAA, and other Regulations
- Using Snowflake's Data Governance Features
- Audit Logging and Access Monitoring

13. Real-World Projects & Case Studies

- End-to-End Data Warehousing Project with Snowflake
- Implementing Real-Time Analytics with Snowflake and Kafka
- Data Governance and Compliance Project in Snowflake
- BI Integration and Dashboarding Project using Snowflake
- Machine Learning Model Deployment with Snowflake