Google Cloud BigQuery for Data Analysts

Course Duration: 40 Hours **Course code: GCBDA**

1. Course Overview

During this five-day course, learners focus on using Google Cloud BigQuery to analyze large-scale datasets efficiently. The course covers data querying, transformation, performance optimization, data visualization integration, and building analytical solutions using BigQuery. Learners will also explore real-time analytics, data pipelines, and integration with other Google Cloud services.

2. What you'll learn?

By the end of the course, you will be able to:

- Describe the architecture, features, and benefits of Google BigQuery
- Load, transform, and manage datasets in BigQuery
- Write efficient SQL queries for large-scale data analysis
- Optimize query performance and manage costs in BigQuery
- Use partitioned and clustered tables for better performance
- Implement data security and access controls in BigQuery
- Integrate BigQuery with Google Cloud services (GCS, Dataflow, Looker Studio)
- Build dashboards and reports using BigQuery data
- Work with real-time and streaming data in BigQuery
- Automate workflows using scheduled queries and APIs

3. Target Audience

Data analysts, business analysts, BI professionals, data engineers (beginner to intermediate), database professionals, and cloud data practitioners working with large datasets.

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4. Pre-Requisites

Before taking this course, you should have:

- Basic understanding of SQL
- Familiarity with relational databases
- Basic knowledge of cloud computing concepts (preferred)

5. Course content

Module 1: Course Introduction

- Introduction and course logistics
- Course objectives and learning outcomes
- Overview of Google Cloud Platform (GCP)

Module 2: Introduction to BigQuery

- What is Google BigQuery?
- BigQuery architecture and components
- Serverless data warehouse concepts
- Use cases and real-world applications

Module 3: Getting Started with BigQuery

- Navigating Google Cloud Console
- Creating projects and datasets
- Understanding datasets, tables, and schemas
- Loading data into BigQuery (batch and streaming)

Module 4: Querying Data in BigQuery

- Introduction to BigQuery SQL (Standard SQL)
- Writing basic SELECT queries
- Filtering, sorting, and aggregating data
- Working with joins and subqueries

Module 5: Advanced SQL for Data Analysis

- Window functions and analytical queries
- Working with arrays and structs
- Common table expressions (CTEs)
- Data transformation techniques

Module 6: Managing Tables and Data

- Creating and managing tables
- Partitioned tables
- Clustered tables
- Table expiration and lifecycle management

Module 7: Data Loading and Exporting

- Loading data from Google Cloud Storage (GCS)
- Streaming inserts
- Data import formats (CSV, JSON, Avro, Parquet)
- Exporting data from BigQuery

Module 8: Performance Optimization and Cost Management

- Query optimization techniques
- Understanding query execution plans
- Cost estimation and pricing model
- Best practices to reduce query costs

Module 9: Security and Access Control

- Identity and Access Management (IAM)
- Dataset and table-level permissions
- Column-level security
- Data encryption and compliance

Module 10: Working with BigQuery APIs and Automation

- Introduction to BigQuery APIs
- Automating workflows using scheduled queries
- Using BigQuery with Python and client libraries
- Integration with Cloud Functions

Module 11: Real-Time Analytics and Streaming

- Streaming data into BigQuery
- Real-time data processing concepts
- Integration with Pub/Sub and Dataflow
- Use cases for real-time analytics

Module 12: Data Visualization and Reporting

- Connecting BigQuery to Looker Studio (Data Studio)
- Creating dashboards and reports
- Data storytelling techniques
- Integration with third-party BI tools

Module 13: Integration with Google Cloud Ecosystem

- BigQuery with Cloud Storage
- BigQuery with Dataflow and Dataproc
- Introduction to BigQuery ML
- Overview of AI/ML use cases

Module 14: BigQuery ML (Machine Learning)

- Introduction to BigQuery ML
- Creating and training ML models using SQL
- Model evaluation and prediction
- Use cases for predictive analytics

Module 15: Best Practices and Capstone Project

- BigQuery best practices
- Data modeling strategies
- End-to-end analytics project
- Course summary and next steps

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