



BigQuery for Data Analysts

Course description

In this course, data analysts will gain comprehensive knowledge and practical skills to leverage Google Cloud's BigQuery for advanced data analytics. You will learn how to efficiently query massive datasets, optimize query performance, manage data, and integrate BigQuery with various business intelligence tools. The course covers fundamental to advanced SQL techniques, data ingestion methods, an introduction to BigQuery ML, and best practices for cost-effective and secure data analysis. By the end of this course, you will be equipped to perform sophisticated data exploration, build analytical reports, and derive actionable insights from petabyte-scale data within the BigQuery environment.

- Course level: Intermediate
- Duration: 2 days

Activities

This course includes presentations, hands-on labs, live demonstrations, and group exercises to reinforce learning.

Course objectives

In this course, you will learn to:

- Explain the core architecture and key concepts of Google BigQuery
- Write efficient and complex SQL queries to analyze large datasets
- Optimize query performance and manage BigQuery costs effectively

- Ingest and manage data within BigQuery tables and datasets
- Utilize BigQuery ML to build and deploy machine learning models for analytical tasks
- Connect BigQuery to popular business intelligence and visualization tools
- Implement security best practices and data governance principles in BigQuery
- Solve real-world data analysis problems using BigQuery's powerful features

Intended audience

This course is intended for data professionals who need to work with large-scale datasets and require efficient analytical capabilities:

- Data Analysts
- Business Intelligence Developers
- SQL Developers
- Data Scientists (seeking a powerful data platform)
- Data Engineers (focusing on consumption and analysis)
- Anyone working with large data warehouses or data lakes

Prerequisites

We recommend that attendees of this course have:

- Fundamental understanding of SQL syntax and concepts (e.g., SELECT, FROM, WHERE, GROUP BY, JOIN)
- Basic familiarity with cloud computing concepts (e.g., projects, resources)
- Experience with data analysis or reporting tools is beneficial

Course outline

Module 1: Introduction to Google BigQuery

- What is BigQuery? A fully managed, serverless data warehouse
- BigQuery architecture and core components (datasets, tables, views, jobs)
- BigQuery's advantages for data analysts (scale, performance, cost-effectiveness)
- Understanding BigQuery pricing model (storage, query, streaming)

- Setting up your GCP project and BigQuery environment
- Navigating the BigQuery UI and command-line tools

Module 2: Querying Data with Standard SQL

- BigQuery Standard SQL overview and features
- Querying public datasets and sample data
- Basic SELECT statements, filtering (WHERE), sorting (ORDER BY)
- Aggregation functions (COUNT, SUM, AVG, MIN, MAX) and GROUP BY
- Joining multiple tables (INNER, LEFT, RIGHT, FULL OUTER JOIN)
- Subqueries and Common Table Expressions (CTEs)
- Hands-on Lab: Basic Data Exploration and Reporting

Module 3: Advanced Querying and Performance Optimization

- Window functions (ROW_NUMBER, RANK, LAG, LEAD, NTILE)
- Array functions (ARRAY_AGG, UNNEST)
- JSON functions and working with semi-structured data
- User-Defined Functions (UDFs) for custom logic
- Optimizing query performance: Partitioning and Clustering
- Using wildcards for querying multiple tables
- Understanding query execution plans and slot usage
- Hands-on Lab: Optimizing Complex Queries for Performance

Module 4: Data Ingestion and Management

- Loading data into BigQuery: Batch loading (CSV, JSON, Avro, Parquet, ORC)
- Schema definition and evolution
- Streaming data ingestion with BigQuery
- Managing tables: Creating, updating, deleting tables, and data manipulation language (DML)
- Creating and managing views (logical and materialized views)
- External tables and querying data outside BigQuery (e.g., Google Cloud Storage)
- Hands-on Lab: Ingesting and Managing Datasets

Module 5: BigQuery ML for Data Analysts

- Introduction to BigQuery ML: Democratizing machine learning
- Supported ML models for analysts (e.g., linear regression, logistic regression, k- means)
- Training and evaluating ML models directly within BigQuery using SQL

- Making predictions with trained models
- Use cases for BigQuery ML in business analytics
- Hands-on Lab: Building a Predictive Model with BigQuery ML

Module 6: Connecting BigQuery to BI and Visualization Tools

- BigQuery BI Engine for accelerating analytics
- Connecting BigQuery to Looker Studio (formerly Data Studio)
- Integrating BigQuery with popular BI tools like Tableau and Power BI
- Exporting query results to Google Cloud Storage or other destinations
- Building interactive dashboards and reports
- Hands-on Lab: Visualizing BigQuery Data with Looker Studio

Module 7: Security, Governance, and Best Practices

- BigQuery access control with Identity and Access Management (IAM)
- Dataset and table-level security considerations
- Data anonymization and pseudonymization techniques
- Understanding BigQuery audit logs and query history
- Best practices for data organization, naming conventions, and project structure
- Cost control strategies for BigQuery usage
- Hands-on Lab: Implementing Data Security and Access Controls

Module 8: Course Wrap-up and Next Steps

- Review of key BigQuery concepts and skills
- Q&A session with the instructor
- Exploring advanced topics (e.g., BigQuery Omni, BigQuery GIS, Dataform)
- Additional resources for continued learning and BigQuery development
- Course summary and feedback
- Capstone Exercise (optional): Analyze a real-world dataset from end-to-end

Your course overview ends here.
But your cloud journey doesn't!

Unlock advanced training and certification pathways with **CloudThat**.



About CloudThat

Established in 2012, CloudThat is an award-winning company and the first in India to offer cloud training and consulting services for individuals and enterprises worldwide. Recently, it won Google Cloud's New Training Partner of the Year Award for 2025, becoming the first company in the world in 2025 to hold awards from all three major cloud giants: AWS, Microsoft, and Google. CloudThat notably won consecutive AWS Training Partner of the Year (APJ) awards in 2023 and 2024 and the Microsoft Training Services Partner of the Year Award in 2024, bringing its total award count to an impressive 12 awards in the last 8 years.

CloudThat specializes in Cloud Migration, Data Platforms, DevOps, IoT, and cutting-edge technologies like Gen AI & AI/ML. As a Microsoft Solutions Partner, AWS Premier Tier Training Partner, Google Cloud Platform Partner, and collaborator with leading organizations like HPE, Oracle, Nvidia and Databricks, CloudThat has trained over 850,000 professionals across 600+ cloud certifications, empowering students and professionals worldwide to advance their skills and careers.

To know more about our cloud certification training, email at sales@cloudthat.com or call us at [+91-8880002200](tel:+91-8880002200) or [+1-8555588830](tel:+1-8555588830) for those from outside India.