Google Cloud

Google Cloud Fundamentals for Researchers

In this course you will learn how to use various tools in Google Cloud to ingest, manage and leverage your data to derive insights in your research. You will be introduced to tools used on Google Cloud by researchers, then you will learn how to ingest your unstructured and structured data into Cloud Storage and BigQuery respectively. Next, you will learn how to curate your data and understand costs in Google Cloud. Finally you will learn how to leverage notebook environments and other Google Cloud tools for descriptive and predictive analysis.

DURATION
1 day

LEVEL
Introductory

FORMAT
Instructor led

What you'll learn

- Understand products available in Google Cloud for research
- Load unstructured and structured data into Google Cloud
- Manage access and sharing your data on Google Cloud
- Understand costs on Google Cloud
- Leverage Jupyter Notebook environments in Vertex AI Workbench
- Utilize machine learning solutions on Google Cloud

Overview	6 modules · 5 labs
Who this course is for	Customers
Products	• Compute Engine • Cloud Storage • BigQuery • Looker Studio • Vertex AI Workbench • Vertex AI AutoML
Prerequisite	• Basic knowledge of data types and SQL • Basic programming knowledge • Machine learning models such as supervised versus unsupervised models

Module 01 Google Cloud Demos for Researchers

Topics	• Demo: Provision Compute Engine virtual machines • Demo: Query a billion rows of data in seconds using BigQuery • Demo: Train a custom vision model using AutoML Vision
Objectives	Explore research use cases in Google Cloud through interactive demos.

Module 02 Google Cloud Project Concepts

Topics	• Organizing resources in Google Cloud • Controlling Access to projects and resources • Cost and billing management
Objectives	• Understand how resources in Google Cloud are managed across organizations, folders and projects. • Control access to projects and resources using IAM • Explore billing in Google Cloud

Module 03 Computing and Storage in Google Cloud

Topics	• Interacting with Google Cloud • Create and Manage Cloud Storage Buckets

Topics	• Compute Engine virtual machines • Understanding computing costs • Introduction to HPC on Google Cloud
Objectives	• Understand the methods of interacting with Google Cloud • Store your data in Cloud Storage buckets • Provision Compute Engine virtual machines • Understand computing costs on Google Cloud • Explore how you can create HPC clusters on Google Cloud
Activities	• Lab: Create and Manage a Virtual Machine (Linux) and Cloud Storage • Optional Lab: Deploy an HPC Cluster with Slurm

Module 04 BigQuery

Topics	• BigQuery fundamentals • Querying public datasets • Importing and exporting data in BigQuery • Connecting to Looker Studio
Objectives	• Understand the fundamentals of BigQuery • Query public datasets in BigQuery Studio • Manage datasets in BigQuery • Connect data in BigQuery to Looker Studio
Activities	Lab: BigQuery and Looker Studio Fundamentals

Module 05 Notebooks on Vertex AI

Topics	• Vertex AI • Vertex AI Workbench • Connecting Jupyter notebooks to BigQuery
Objectives	• Explore Vertex AI as a machine learning platform • Provision Jupyter notebooks using Vertex AI Workbench
Activities	Lab: Interacting with BigQuery using Python and R Running in Jupyter Notebooks

Module 06 Machine Learning on Google Cloud

Topics

- ML Options on Google Cloud
- Prebuilt ML APIs
- Vertex AI AutoML
- BigQuery ML

Objectives

- Explore machine learning options on Google Cloud
- Understand unstructured data using prebuilt ML APIs
- Create no-code custom ML models using Vertex AI AutoML
- Create custom ML models using SQL on BigQuery ML

Activities

- Optional Lab: Extract, Analyze, and Translate Text from Images with the Cloud ML APIs
- Optional Lab: Identify Damaged Car Parts with Vertex AutoML Vision
- Optional Lab: Getting Started with BigQuery Machine Learning