Training: Google Cloud
Google Cloud Fundamentals for Researchers

TRAINING GOALS:

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.

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

Audience

This course is intended for scientific researchers who are new to Google Cloud and seek to leverage its computing, storage, and AI/ML capabilities for accelerating data analysis and research projects.

Products

- Compute Engine
- Cloud Storage
- BigQuery
- Looker Studio
- Vertex AI Workbench
- Vertex AI AutoML

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CONSPECT:

- 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.
- 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
- Computing and Storage in Google Cloud
  - Topics
    - Interacting with Google Cloud
    - Create and Manage Cloud Storage Buckets
    - 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
- BigQuery

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- 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

- 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
- 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

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- Optional Lab: Getting Started with BigQuery Machine Learning

REQUIREMENTS:

- Basic knowledge of data types and SQL
- Basic programming knowledge
- Machine learning models such as supervised versus unsupervised models

Difficulty level



CERTIFICATE:

The participants will obtain certificates signed by Google Cloud (course completion).

TRAINER:

Authorized Google Cloud Trainer

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