Training: Google Cloud
Agent Platform Forecasting and Time Series in Practice

Google Cloud

TRAINING GOALS:

This course is an introduction to building forecasting solutions with Google Cloud. You start with sequence models and time series foundations. You then walk through an end-to-end workflow: from data preparation to model development and deployment with Agent Platform. Finally, you learn the lessons and tips from a retail use case and apply the knowledge by building your own forecasting models.

What you'll learn:

- Understand the main concepts and the applications of a sequence model, time series, and forecasting.
- Identify the options to develop a forecasting model on Google Cloud.
- Describe the workflow to develop a forecasting model by using Agent Platform.
- Prepare data (including ingestion and feature engineering) by using BigQuery and Agent Platform managed datasets.
- Train a forecasting model and evaluate the performance by using AutoML.
- Deploy and monitor a forecasting model by using Agent Platform Pipelines.
- Build a forecasting solution from end-to-end using a retail dataset.

Audience

Professional data analysts, data scientists, and ML engineers who want to build end-to end high performance forecasting solutions on Google Cloud and add automation to the workflow.

Products

- Agent Platform
- Time Series Foundation Model
- Gemini Enterprise Agent Platform Pipelines
- BigQuery Studio

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- Agent Studio on Gemini Enterprise Agent Platform
- Gemini Enterprise Agent Platform Model Garden
- AutoML
- BigQuery ML
- Agent Platform Pipelines
- TensorFlow

CONSPECT:

- Module 1 - Course Introduction
  - Topics:
    - This module addresses the reasons to build a forecasting solution on Google Cloud and introduces the learning objectives.
  - Objectives:
    - Identify the reasons to learn Agent Platform Forecasting from Google.
    - Learn the course objectives.
- Module 2 - Time Series and Forecasting Fundamentals
  - Topics:
    - This module provides a theoretical foundation of types of sequence models, time series patterns and analysis, and forecasting notations.
  - Objectives:
    - Identify the different types of sequence models.
    - Identify the different patterns and analysis methods of time series.
    - Describe the primary notations of forecasting.
  - Activities:
    - Quiz
- Module 3 - Forecasting Options on Google Cloud
  - Topics:
    - This module introduces two major options to build a forecasting solution on Google Cloud: BigQuery ML and Agent Platform Forecast (AutoML). It also investigates the unique features of Agent Platform Forecast and explores an end-to-end workflow with AutoML.
  - Objectives:
    - Identify the options to develop forecasting models on Google Cloud.
    - Describe Agent Platform and its benefits.
    - Explore the workflow to build a forecasting model by using Agent Platform.
  - Activities:
    - Lab: Building Demand Forecasting with BigQuery ML

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- Quiz

- Module 4 - Data Preparation
  - Topics:
    - This module explores the transformation of original data to the data types and format supported by Agent Platform. It also introduces the different types of features in time series and the best practices for data ingestion.
  - Objectives:
    - Prepare the input data to fit the requirements of Agent Platform Forecasting.
    - Demonstrate different types of features.
    - Describe the best practices for the data ingestion stage.
  - Activities:
    - Quiz
- Module 5 - Model Training
  - Topics:
    - This module walks learners through the model training and demonstrates the configuration details such as the setup of context window, forecast horizon, and optimization objective.
  - Objectives:
    - Configure model training.
    - Select the appropriate training optimization objective.
  - Activities:
    - Lab: Training a Model with Agent Platform Forecast
    - Quiz
- Module 6 - Model Evaluation
  - Topics:
    - This module describes the training data split, demonstrates the evaluation metrics, and recommends the approaches to improve the model performance.
  - Objectives:
    - Demonstrate training data split in time series forecasting.
    - Describe evaluation metrics.
    - Design the approach to improve the performance.
  - Activities:
    - Quiz
- Module 7 - Model Deployment
  - Topics:
    - This module demonstrates model prediction, specifically the batch prediction with Agent Platform Forecast. It also explores machine learning operations (MLOps) and the transition from development to production.

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- Objectives:
  - Deploy the forecasting model.
  - Describe Agent Platform Pipelines and MLOps
  - Use batch predictions to generate model forecasts.
- Activities:
  - Quiz

- Module 8 - Model Monitoring
  - Topics:
    - This module describes model drift and the approach of model retraining. It also demonstrates the automation of the forecasting workflow by using Agent Platform Pipelines.
  - Objectives:
    - Describe model drift.
    - Demonstrate model retraining.
    - Use Agent Platform Pipelines and prebuilt (SDKs) to automate the forecasting workflow.
  - Activities:
    - Lab (optional): Building a Forecasting Pipeline with Agent Platform Python SDKs
    - Quiz

- Module 9 - Agent Platform Forecasting in Retail
  - Topics:
    - This module describes a use case to build a forecasting solution with Agent Platform Forecast in a retail store. It demonstrates the steps and considerations, walks through a pilot study with two different datasets, and discusses the challenges and lessons.
  - Objectives:
    - Describe the steps and considerations of building a forecasting solution in retail.
    - Demonstrate the model development with different datasets.
    - Identify the challenges and the lessons of developing a forecasting model in retail.
  - Activities:
    - Lab: Developing an End-to-end Forecasting Solution in Retail

- Module 10 - Course Summary
  - Topics:
    - This module addresses the main features of Agent Platform Forecast and summarizes the main topics of each module.
  - Objectives:
    - Summarize the steps to build a forecasting model with Agent Platform.

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REQUIREMENTS:

- Basic knowledge of Python syntax
- Basic understanding of machine learning models
- Prior experience building machine learning solutions on Google Cloud

Difficulty level

CERTIFICATE:

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

TRAINER:

Authorized Google Cloud Trainer

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