Training an AutoML Classification Model - Structured Data

3 hours Free

Overview

In this lab, you create a tabular dataset using Vertex AI and use it to train a classification model.

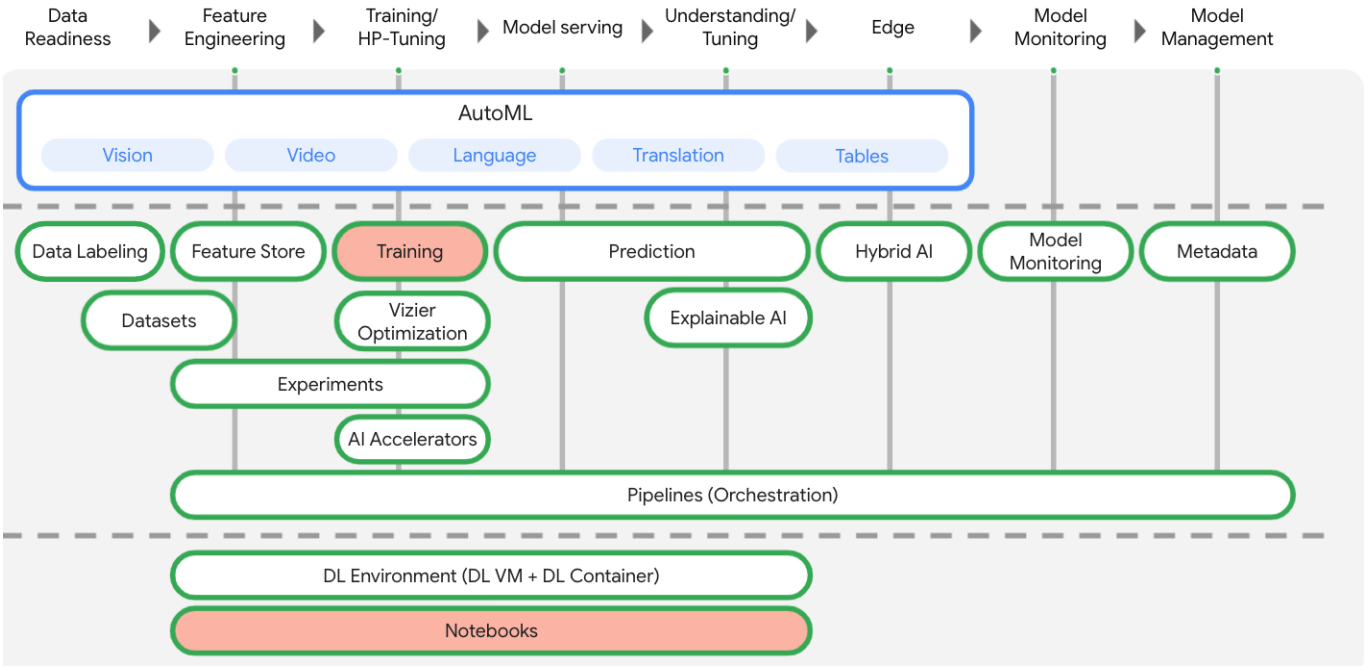
Learning objectives

- Create a dataset and train an AutoML classification model.
- Deploy a model and request a prediction.

Introduction to Vertex AI

This lab uses the newest AI product offering available on Google Cloud. Vertex AI integrates the ML offerings across Google Cloud into a seamless development experience. Previously, models trained with AutoML and custom models were accessible via separate services. The new offering combines both into a single API, along with other new products. You can also migrate existing projects to Vertex AI. If you have any feedback, please refer to the support page.

Vertex AI includes many different products to support end-to-end ML workflows. This lab focuses on the products highlighted below: Training/HP-Tuning and Notebooks.



Setup

For each lab, you get a new Google Cloud project and set of resources for a fixed time at no cost.

1. Sign in to Qwiklabs using an **incognito window**.
2. Note the lab's access time (for example, `1:15:00`), and make sure you can finish within that time.
   There is no pause feature. You can restart if needed, but you have to start at the beginning.
3. When ready, click **Start lab**.
4. Note your lab credentials (**Username** and **Password**). You will use them to sign in to the Google Cloud Console.
5. Click **Open Google Console**.
6. Click **Use another account** and copy/paste credentials for **this** lab into the prompts.
   If you use other credentials, you'll receive errors or **incur charges**.
7. Accept the terms and skip the recovery resource page.

Note: Do not click **End Lab** unless you have finished the lab or want to restart it. This clears your work and removes the project.

1. In the Google Cloud Console, on the **Navigation menu**, click **Vertex AI**.
2. Click **Enable All Recommended API**.

Task 2. Create a dataset and training an AutoML classification model

Create a tabular dataset

1. In the Vertex AI console, on the **Dashboard** page, click **Create dataset**.
2. For the dataset name, type **Structured_AutoML_Tutorial**
3. For data type and objective, select **Tabular**.
4. Accept the defaults and click **Create**.
5. For **Select a data source**, select **Select CSV files from Cloud Storage**, and for **Import file path**, type **cloud-training/mlongcp/v3.0_MLonGC/toy_data/bank-marketing_toy.csv**
6. Click **Continue**.

The **Analyze** pane opens.

7. Click **Generate statistics**.

It will take few minutes to generate statistics.

When the statistics are generated, you can click on any feature to see more details about the data for that feature.

Train an AutoML classification model

1. Click **Train new model** and select **Other**.
2. In the **Train new model** pane, for **Objective**, select **Classification**.
3. Select the **AutoML** training method, and click **Continue**.
4. For **Target column**, select **Deposit**, and click **Continue**.

The list of columns is displayed with the transformation that will be used for each feature.

5. To display the **Compute and pricing** pane, click **Continue**.
6. For **Budget**, type **1**
7. Click **Start training**.

The training budget determines actual training time, but the time to complete training includes other activities, so the entire process can take about two hours. When the model finishes training it is displayed in the **Model Registry** pane as a live link with a green checkmark status icon.

Note: It takes nearly 2 hours to complete the training. Please wait till the training get completed.

Task 3. Deploy a model and requesting a prediction

Deploy your model to an endpoint

1. In the **Vertex AI** console, in the navigation pane, click **Model Registry**.
2. Click on your Model name and then click on your Version ID to open its **Evaluate** pane. This panel displays quality metrics for the model, including a confusion matrix.
3. To see evaluation metrics for a value, select that value for the target column.

The effect of each column on model training (feature importance) is displayed.

4. In the **Deploy & test** pane, under **Deploy your model**, click **Deploy to endpoint**.
5. For **Endpoint name**, type **Structured_AutoML_Tutorial** and click **Continue**.
6. On **Model settings** page, for **Explainability option** enable the **Enable feature attributions for this model**.
7. Click **Done**, and click **Continue**.
8. On **Model monitoring** page review the default settings and click **Continue**.
9. For **Training data source**, select **Vertex AI dataset** and choose your dataset from the dropdown.
10. For **Target column** type **Deposit**.
11. Under **Alert thresholds** enable the toggle to train model that are configured to have attribution scrores through Explainable AI.
12. To create your endpoint and deploy your model to it, click **Deploy**.

Deploying a model can take several minutes.

Request a prediction

While the endpoint is being created, you can optionally enter a set of values for a prediction.

1. Return to the **Models** list in the navigation pane and open your newly created model.
2. Open the **Deploy & test** pane.

You can use the prefilled values for the prediction data or enter your own.

3. When the model is deployed, click **Predict**.

For this model, a prediction result of 1 represents a negative outcome: a deposit is not made at the bank. A prediction result of 2 represents a positive outcome: a deposit is made at the bank.

If you used the pre-filled prediction values, the local feature importance values are all zero. This is because the pre-filled values are the baseline prediction data, so the prediction returned is the baseline prediction value.

End your lab

When you have completed your lab, click **End Lab**. Qwiklabs removes the resources you've used and cleans the account for you.

You will be given an opportunity to rate the lab experience. Select the applicable number of stars, type a comment, and then click **Submit**.

The number of stars indicates the following:

- 1 star = Very dissatisfied
- 2 stars = Dissatisfied
- 3 stars = Neutral
- 4 stars = Satisfied
- 5 stars = Very satisfied

You can close the dialog box if you don't want to provide feedback.

For feedback, suggestions, or corrections, please use the **Support** tab.

- Overview
- Introduction to Vertex AI
- Setup
- Task 1. Enable the Vertex AI API
- Task 2. Create a dataset and training an AutoML classification model
- Task 3. Deploy a model and requesting a prediction
- End your lab