

## Google Cloud Skills Boost for Partners

[Main menu](#)

**Build and Deploy Machine Learning Solutions on Vertex AI**

---

Course · 6 hours 50%  
45 minutes complete

[Course overview](#)

**Build and Deploy Machine Learning Solutions on Vertex AI**

- Identify Damaged Car Parts with Vertex AutoML Vision
- Deploy a BigQuery ML Customer Churn Classifier to Vertex AI for Online Predictions
- Vertex AI Pipelines: Qwik Start
- ...

Course &gt; Build and Deploy Machine Learning Solutions on Vertex AI &gt;

Quick tip: Review the prerequisites before you run the lab

[Start Lab](#)

01:30:00

# Deploy a BigQuery ML Customer Churn Classifier to Vertex AI for Online Predictions

Lab 1 hour 30 minutes No cost Intermediate

Rate Lab

This lab may incorporate AI tools to support your learning.

Lab instructions and tasks

-/100

GSP944

Overview

Objectives

Setup and requirements

Task 1. Create a Vertex AI Workbench instance

Task 2. Copy the notebook from a Cloud Storage bucket

Task 3. Create a BigQuery dataset

Task 4. Create a BigQuery ML XGBoost churn propensity model

[Previous](#)[Next >](#)

## GSP944



## Google Cloud Self-Paced Labs

## Overview

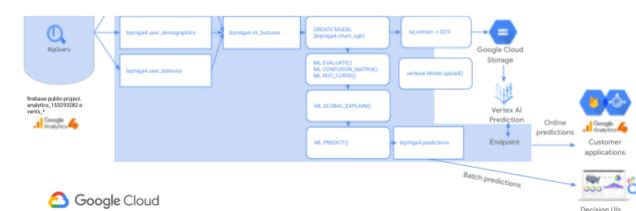
In this lab, you will train, tune, evaluate, explain, and generate batch and online predictions with a BigQuery ML XGBoost model. You will use a Google Analytics 4

your BigQuery ML model as well as export and deploy it to **Vertex AI** for online predictions using the Vertex AI Python SDK.

**BigQuery ML** lets you train and do batch inference with machine learning models in BigQuery using standard SQL queries faster by eliminating the need to move data with fewer lines of code.

**Vertex AI** is Google Cloud's complimentary next generation, unified platform for machine learning development. By developing and deploying BigQuery ML machine learning solutions on Vertex AI, you can leverage a scalable online prediction service and MLOps tools for model retraining and monitoring to significantly enhance your development productivity, the ability to scale your workflow and decision making with your data, and accelerate time to value.

### Lab Architecture Diagram



Note: BQML is now BigQuery ML.

This lab is inspired by and extends [Churn prediction for game developers using Google](#)

[View the blog post](#) and [download the tutorial code](#) for this lab.

[Analytics 4 \(GA4\) and BigQuery ML](#). Read the blog post and accompanying tutorial for additional depth on this use case and BigQuery ML.

In this lab, you will go one step further and focus on how Vertex AI extends BigQuery ML's capabilities through online prediction so you can incorporate both customer churn predictions into decision making UIs such as [Looker dashboards](#) but also online

## Objectives

In this lab, you learn how to:

- Explore and preprocess a [Google Analytics 4](#) data sample in [BigQuery](#) for machine learning.
- Train a [BigQuery ML XGBoost](#) classifier to predict user churn on a mobile gaming application.
- Tune a BigQuery ML XGBoost classifier using [BigQuery ML hyperparameter tuning features](#).
- Evaluate the performance of a BigQuery ML XGBoost classifier

distributions.

- Generate batch predictions with your BigQuery ML XGBoost model.
- Export a BigQuery ML XGBoost model to a [Google Cloud Storage](#) bucket.
- Upload and deploy a BigQuery ML XGBoost model to a [Vertex AI Prediction](#) Endpoint for online predictions.

## Setup and requirements

### Before you click the Start Lab button

Read these instructions. Labs are timed and you cannot pause them. The timer, which starts when you click Start Lab, is available to you.

This hands-on lab lets you do the lab activities in a real cloud environment, not in a simulation or demo environment. It does so by giving you new, temporary credentials you use to sign in and access Google Cloud for the duration of the lab.

To complete this lab, you need:

- Access to a standard internet browser (Chrome browser recommended).

**Note:** Use an Incognito (recommended) or private browser window to run this lab. This prevents conflicts between your personal account and the student account, which may cause extra charges incurred to your personal account.

- Time to complete the lab—remember, once you start, you cannot pause a lab.

**Note:** Use only the student account for this lab. If you use a different Google Cloud

## Activate Cloud Shell

Cloud Shell is a virtual machine that is loaded with development tools. It offers a persistent 5GB home directory and runs on the Google Cloud. Cloud Shell provides command-line access to your Google Cloud resources.

1. Click **Activate Cloud Shell** at the top of the Google Cloud console.

2. Click through the following windows:

- Continue through the Cloud Shell information window.
- Authorize Cloud Shell to use your credentials to make Google Cloud API calls.

this session:

```
Your Cloud Platform project in this session is set to "PROJECT_ID"
```

gcloud is the command-line tool for Google Cloud. It comes pre-installed on Cloud Shell and supports tab-completion.

3. (Optional) You can list the active account name with this command:

```
gcloud auth list
```



4. Click **Authorize**.

**Output:**

```
ACCOUNT: "ACCOUNT"

To set the active account, run:
$ gcloud config set account `ACCOUNT`
```

5. (Optional) You can list the project ID with this command:

```
gcloud config list project
```



**Output:**

```
[core]
project = "PROJECT_ID"
```

## Task 1. Create a Vertex AI Workbench instance

1. In the Google Cloud console, from the **Navigation menu** (≡), select **Vertex AI > Dashboard**.
2. Click **Enable All Recommended APIs**.
3. On the left-hand side, click **Workbench**.

5. Click **Create New**.

6. **Configure the Instance:**

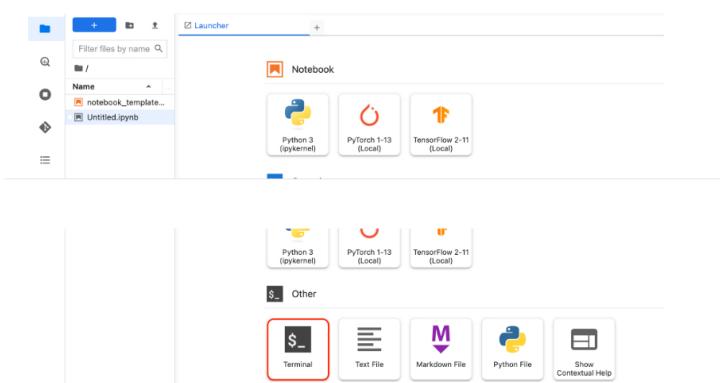
- **Name:** lab-workbench
- **Region:** Set the region to **Region**
- **Zone:** Set the zone to **Zone**
- **Advanced Options (Optional):** If needed, click "Advanced Options" for further customization (e.g., machine type, disk size)

7. Click **Create**.

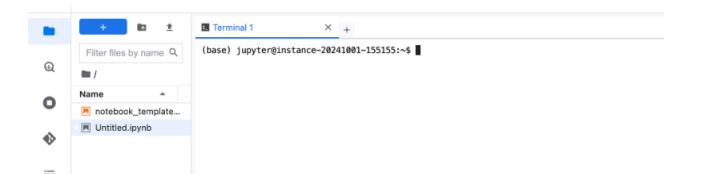
**Note:** The instance will take a few minutes to create. A green checkmark will appear next to its name when it's ready.

8. Click **Open JupyterLab** next to the instance name to launch the JupyterLab interface. This will open a new tab in your browser.

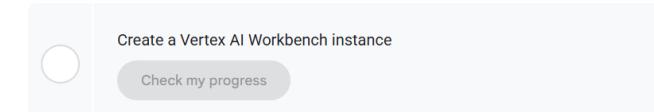
9. Click the **Terminal** icon to open a terminal window.



Your terminal window will open in a new tab. You can now run commands in the terminal to interact with your Workbench instance.



Click **Check my progress** to verify the objective.



## Task 2. Copy the notebook from a Cloud Storage bucket

```
gcloud storage cp "GCS PATH"
```



Click **Check my progress** to verify the objective.



Copy the notebook from a Cloud Storage bucket

**Check my progress**

2. Open the notebook file `lab_exercise.ipynb`.

3. In the **Select Kernel** dialog, choose **TensorFlow 2-11** from the list of available kernels.

4. In the **Define constants** section, update your `REGION` variable with the `Region`.

**SHIFT + ENTER.**

Read the narrative and make sure you understand what's happening in each cell. As you progress through the lab notebook, return back to these instructions to complete the graded exercises.

### Task 3. Create a BigQuery dataset

Click **Check my progress** to verify the objective.

**Create a BigQuery dataset**

### Task 4. Create a BigQuery ML XGBoost churn propensity model

Click **Check my progress** to verify the objective.

**Create a BigQuery ML XGBoost churn propensity model**

**Check my progress**

### Task 5. Evaluate your BigQuery ML model

Click **Check my progress** to verify the objective.

**Evaluate your BigQuery ML model**

**Check my progress**

## with your BigQuery ML model

Click **Check my progress** to verify the objective.



Batch predict user churn with your BigQuery ML model

[Check my progress](#)

## Congratulations!

Use Vertex AI to generate high business impact batch and online churn predictions to target customers likely to churn with interventions such as in-game rewards and reminder notifications.

### Next steps / Learn more

Read more about Vertex AI in the [Vertex AI Documentation](#).

### Google Cloud training and certification

...helps you make the most of Google Cloud technologies. [Our classes](#) include technical skills and best practices to help you get up to speed quickly and continue your learning journey. We offer fundamental to advanced level training, with on-demand, live, and virtual options to suit your busy schedule. [Certifications](#) help you validate and prove your skill and expertise in Google Cloud technologies.

**Manual Last Updated May 14, 2025**

**Lab Last Tested May 14, 2025**

Copyright 2025 Google LLC. All rights reserved. Google and the Google logo are trademarks of Google LLC. All other company and product names may be trademarks of the respective companies with which they are associated.

Build and Deploy