Predict Housing Prices with Tensorflow and AI Platform

GSP418

Overview

In this lab, you will build an end to end machine learning solution using Tensorflow 1.x and AI Platform and leverage the cloud for distributed training and online prediction.

tf.estimator — a high-level TensorFlow API that greatly simplifies machine learning programming. Estimators encapsulate the following actions:

- training
- evaluation
- prediction
- export for serving

This lab is focused on interacting with Jupyter and AI Platform. Non-relevant concepts and code blocks are glossed over and are provided for you to execute in your Jupyter notebook.

Set up

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**, shows how long Google Cloud resources will be made available to you.

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

What you need

To complete this lab, you need:

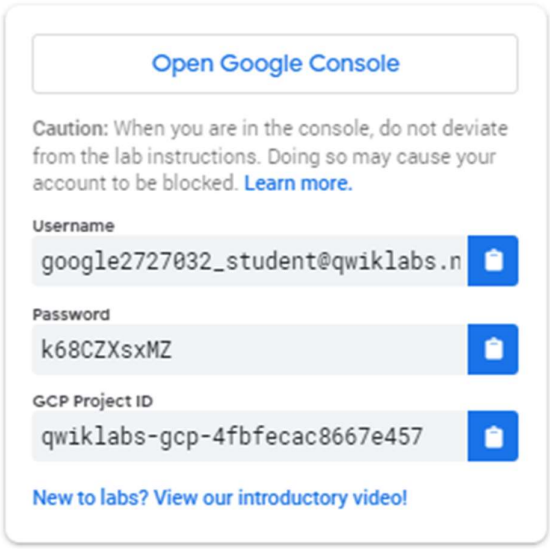
- Access to a standard internet browser (Chrome browser recommended).
- Time to complete the lab.

Note: If you already have your own personal Google Cloud account or project, do not use it for this lab.

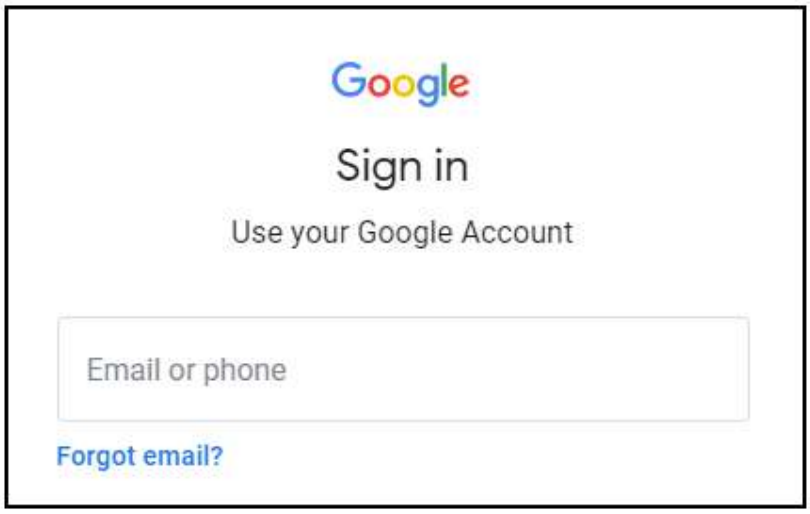
Note: If you are using a Pixelbook, open an Incognito window to run this lab.

How to start your lab and sign in to the Google Cloud Console

1. Click the **Start Lab** button. If you need to pay for the lab, a pop-up opens for you to select your payment method. On the left is a panel populated with the temporary credentials that you must use for this lab.

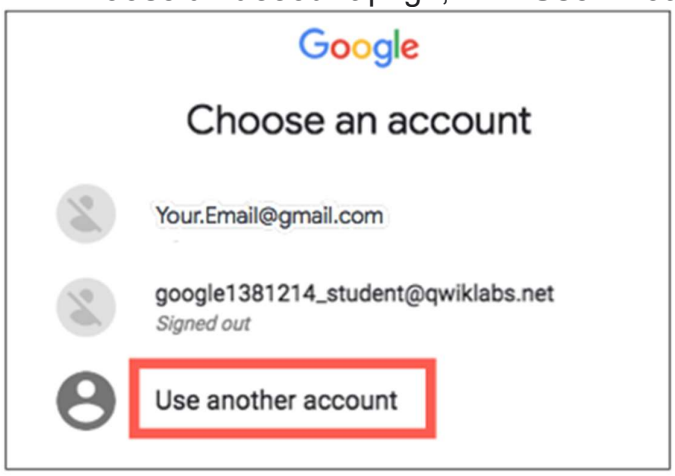


2. Copy the username, and then click **Open Google Console**. The lab spins up resources, and then opens another tab that shows the **Sign in** page.



Tip: Open the tabs in separate windows, side-by-side.

If you see the **Choose an account** page, click **Use Another Account**.



3. In the **Sign in** page, paste the username that you copied from the Connection Details panel. Then copy and paste the password.

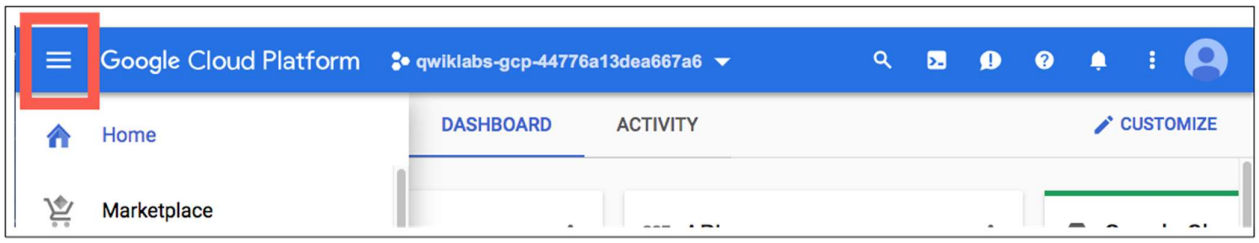
   Important: You must use the credentials from the Connection Details panel. Do not use your Qwiklabs credentials. If you have your own Google Cloud account, do not use it for this lab (avoids incurring charges).

4. Click through the subsequent pages:

   - Accept the terms and conditions.
   - Do not add recovery options or two-factor authentication (because this is a temporary account).
   - Do not sign up for free trials.

After a few moments, the Cloud Console opens in this tab.

Note: You can view the menu with a list of Google Cloud Products and Services by clicking the **Navigation menu** at the top-left.



Create Storage Bucket

Create a bucket using the Cloud Console:

1. Click on the **Navigation menu**, and select **Storage**.

2. Click on **Create bucket**.

3. Set a unique name (use your project ID because it is unique) and then choose a regional bucket, setting the region to `us-central1`. Then, click **Create**.

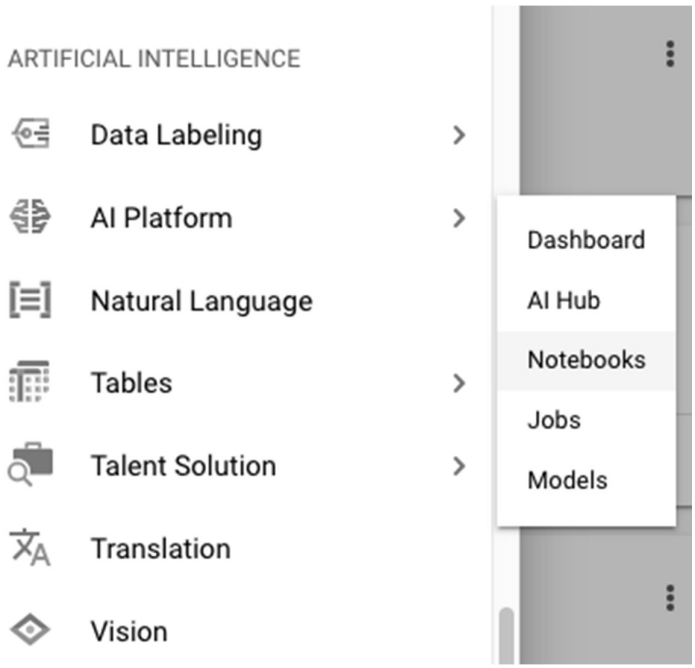
Click **Check my progress** to verify your performed task. If you have completed the task successfully you will be granted with an assessment score.

Launch AI Platform Notebooks

To launch AI Platform Notebooks:

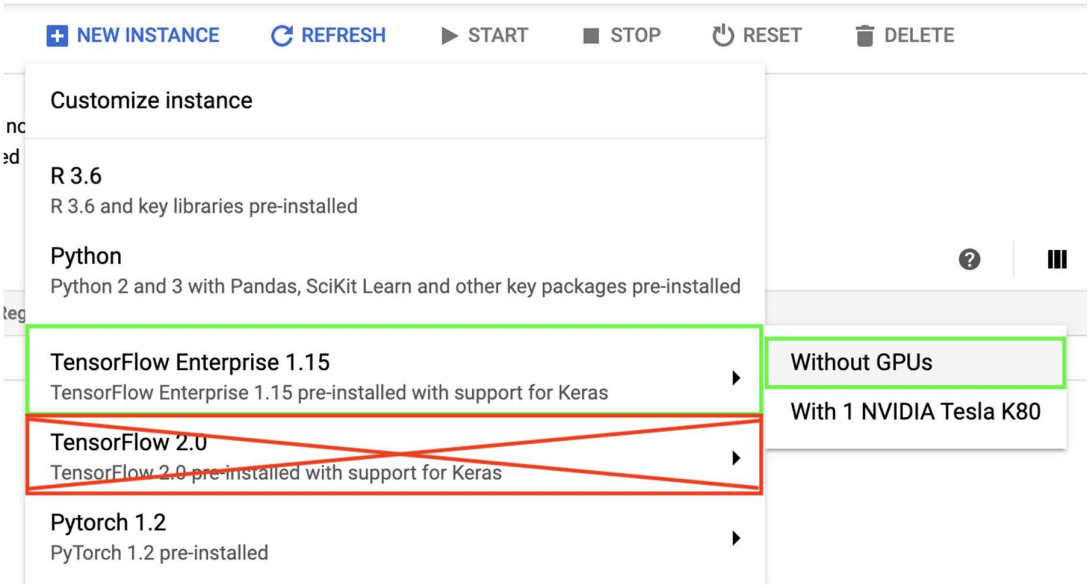
Step 1

Click on the **Navigation Menu**. Navigate to **AI Platform**, then to **Notebooks**.



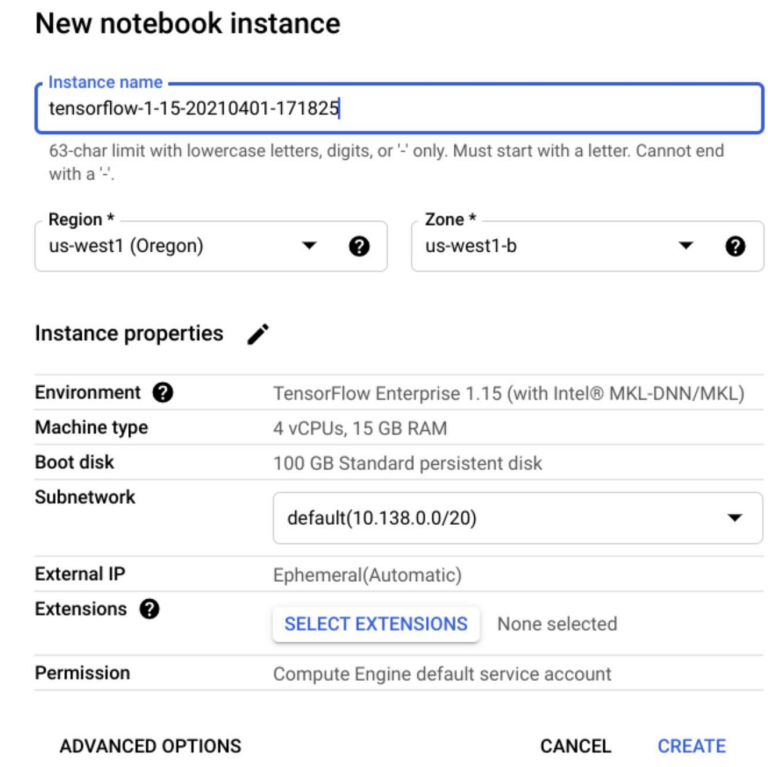
Step 2

On the Notebook instances page, click + NEW INSTANCE. Select a `1.xx` version of TensorFlow (not 2.0) *without GPUs*. In the following example, you would select **Tensorflow Enterprise 1.15** > **Without GPUs**:



Tensorflow 1.XX versions change semi-frequently, so the version you pick may be different.

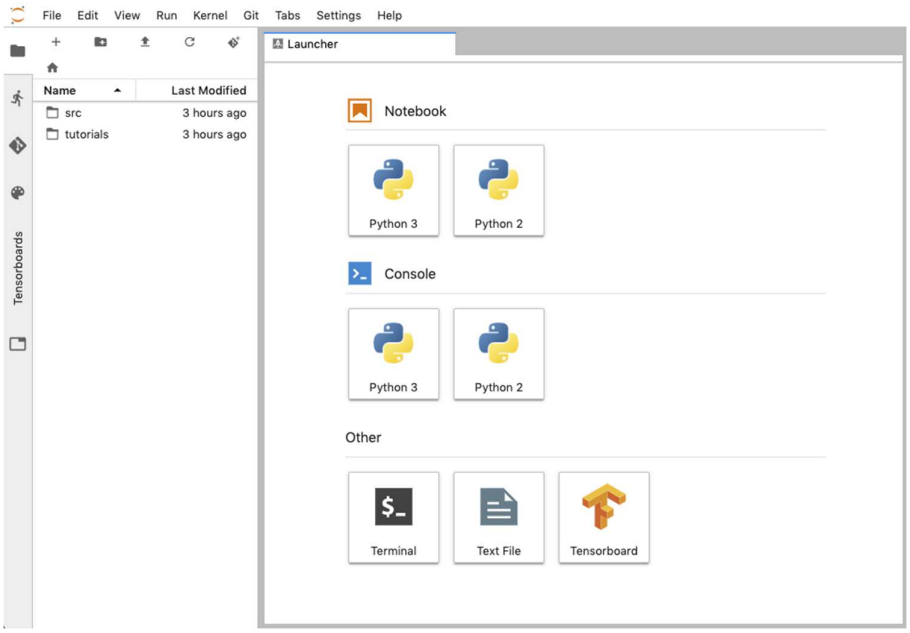
In the pop-up, confirm the name of the deep learning VM and click **Create**.



The new VM will take 2-3 minutes to start.

Step 3

Click **Open JupyterLab**. A JupyterLab window will open in a new tab.

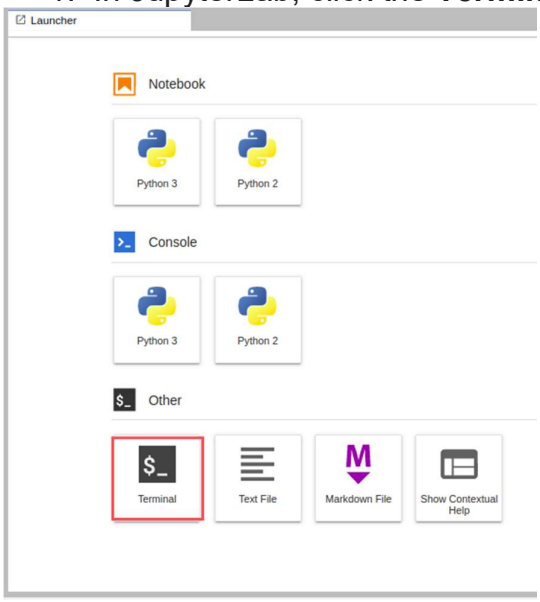


Click **Check my progress** to verify your performed task. If you have completed the task successfully you will be granted with an assessment score.

Download lab notebook

To clone the `training-data-analyst` notebook in your JupyterLab instance:

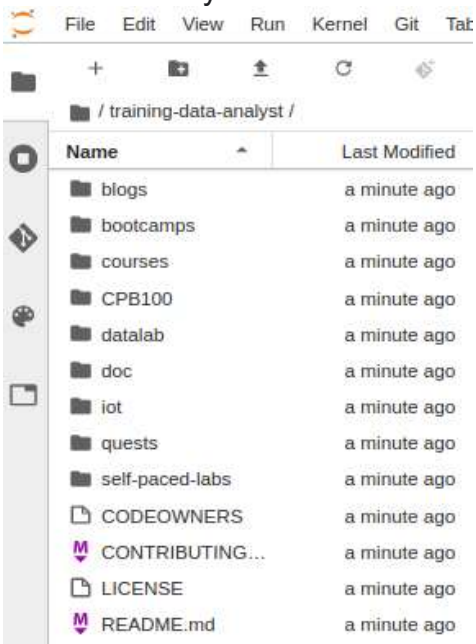
1. In JupyterLab, click the **Terminal** icon to open a new terminal.



2. At the command-line prompt, type in the following command and press Enter.

```
git clone https://github.com/GoogleCloudPlatform/training-data-analyst
```

3. Confirm that you have cloned the repository by double clicking on the `training-data-analyst` directory and ensuring that you can see its contents. The files for all the Jupyter notebook-based labs throughout this course are available in this directory.



Click **Check my progress** to verify your performed task. If you have completed the task successfully you will be granted with an assessment score.

Open and execute the housing prices notebook

From within the Jupyter console, select **training-data-analyst > blogs > housing_prices > cloud-ml-housing-prices.ipynb** to begin the lab. Now you're ready to start!

In the top ribbon, click **Edit** > **Clear All Outputs**.

From the top right corner, select **Python 2** and change it to **Python 3**.

From here, read the instructions in the notebook to complete the lab.

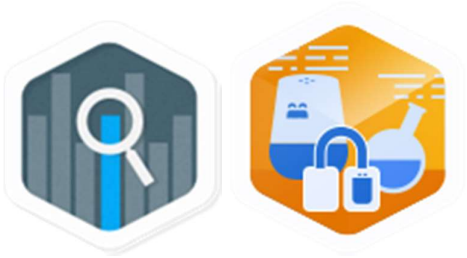
Execute the cells one by one and observe the results. A convenient way to progress through the cells is by clicking in a cell, then click `Shift + Enter`, waiting for each cell to complete before progressing.

Read the instructions and the comments in the code blocks carefully. You will be asked to edit some of the code blocks before running them. For example, you will be setting environment variables in the notebook, so add your bucket name and project ID before running the cell.

Click **Check my progress** to verify your performed task. If you have completed the task successfully you will be granted with an assessment score.

Congratulations!

You have used Tensorflow's high level Estimator API to deploy Tensorflow 1.x code for distributed training in the cloud and evaluated the results, then deployed the model to the cloud for online prediction.



Finish Your Quest

This self-paced lab is part of the Qwiklabs Data Engineering and Intermediate ML: TensorFlow on Google Cloud Quests. A Quest is a series of related labs that form a learning path. Completing a Quest earns you a badge to recognize your achievement. You can make your badge (or badges) public and link to them in your online resume or social media account. Enroll in one of the above Quests and get immediate completion credit if you've taken this lab. See other available Qwiklabs Quests.

Take Your Next Lab

Continue your Quest with Cloud Composer: Copy BigQuery Tables Across Different Locations, or check out these suggestions:

- Build an IoT Analytics Pipeline on Google Cloud
- ETL Processing on Google Cloud using dataflow and BigQuery

Next steps / learn more

Check out official documentation on:

- If you're interested more in-depth training, try the Cloud ML coursera labs.
- Jupyter Notebook Basics (Datalab is based on Jupyter)
- tf.estimator
  Check out this talk from Google Cloud Next '17 on advanced data science on Google Cloud (43:15).

Google Cloud Training & Certification

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Manual Last Updated March 17, 2021
Lab Last Tested March 17, 2021