

[ML on GCP C8] Image Classification with a CNN Model

2 hours

Free

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Overview

Duration is 1 min

In this lab, you will define a cnn model on MNIST to do image classification.

What you learn

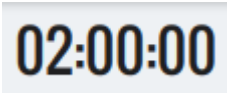
In this lab, you will learn how to:

- Import the training dataset of MNIST handwritten images
- Reshape and preprocess the image data
- Setup your CNN with 10 classes
- Create convolutional and pooling layers + softmax function
- Define and create your EstimatorSpec in tensorflow to create your custom estimator
- Define and run your train_and_evaluate

Setup

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

1. Make sure you signed into Qwiklabs using an **incognito window**.

2. Note the lab's access time (for example,  and make sure you can

finish in that time block.

There is no pause feature. You can restart if needed, but you have to start at the beginning.


3. When ready, click


A green rectangular button with the text "START LAB" in white capital letters.


4. Note your lab credentials. You will use them to sign in to Cloud Platform Console.

Open Google Console

Caution: When you are in the console, do not deviate from the lab instructions. Doing so may cause your account to be blocked. [Learn more.](#)

Username
google2876526_student@qwiklabs.n 

Password
TG959yrKDX 

GCP Project ID
qwiklabs-gcp-0855e773352d3560 

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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 get errors or **incur charges**.

7. Accept the terms and skip the recovery resource page.


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

Create Storage Bucket

Duration is 2 min

Create a bucket using the GCP console:

Step 1

In your GCP Console, click on the **Navigation menu** (), and

select **Storage**.

Step 2

Click on **Create bucket**.

Step 3

Choose a Regional bucket and set a unique name (use your project ID because it is unique). Then, click **Create**.

Launch Cloud Datalab

To launch Cloud Datalab:

Step 1

Open Cloud Shell. The Cloud Shell icon is at the top right of the Google Cloud Platform [web console](#).

Step 2

In Cloud Shell, type:

```
gcloud compute zones  
list
```

Note: Please pick a zone in a geographically close region from the following: **us-east1**, **us-central1**, **asia-east1**, **eu-west1**. These are the regions that currently support Cloud ML Engine jobs. Please verify [here](#) since this list may have changed after this lab was last updated. For example, if you are in the US, you may choose **us-east1-c** as your zone.

Step 3

In Cloud Shell, type:

```
datalab create  
mydatalabvm --zone  
<ZONE>
```

Replace with a zone name you picked from the previous step.

Note: follow the prompts during this process.

Datalab will take about 5 minutes to start.

Step 4

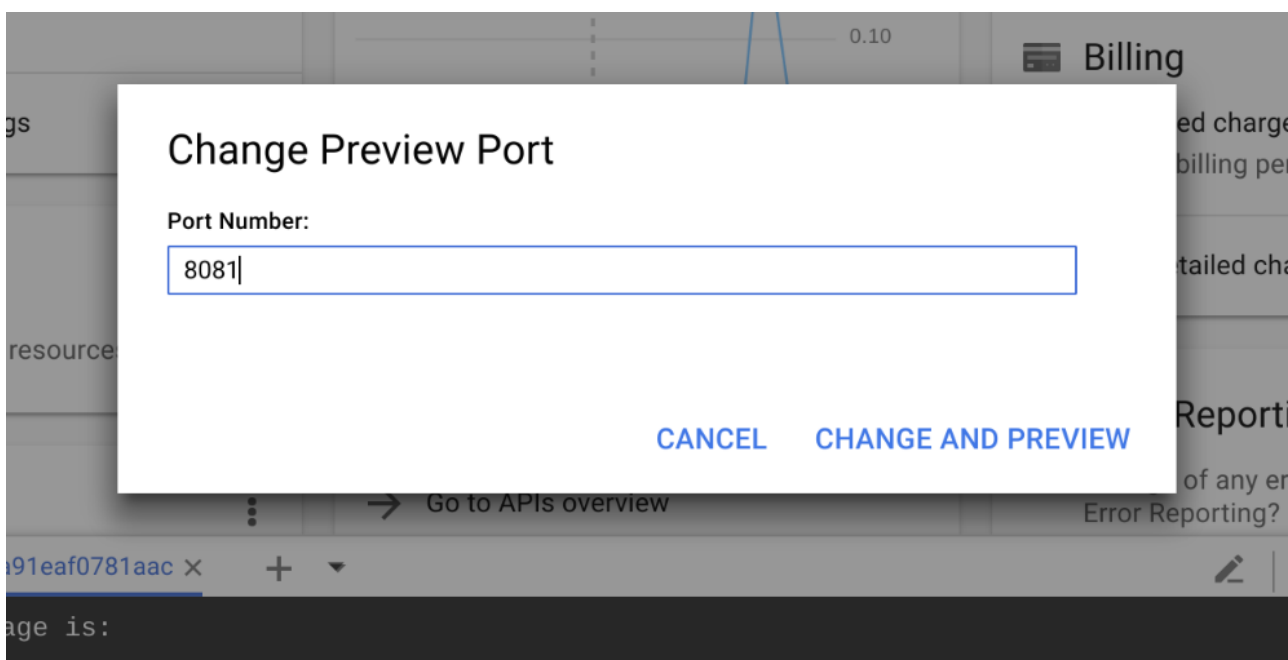
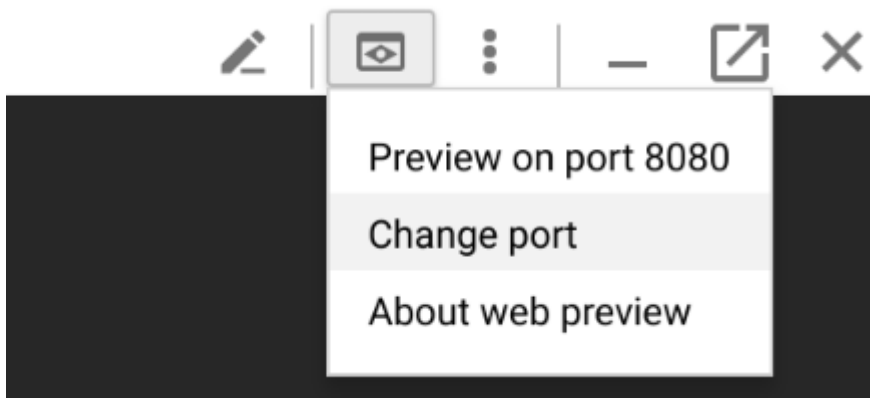
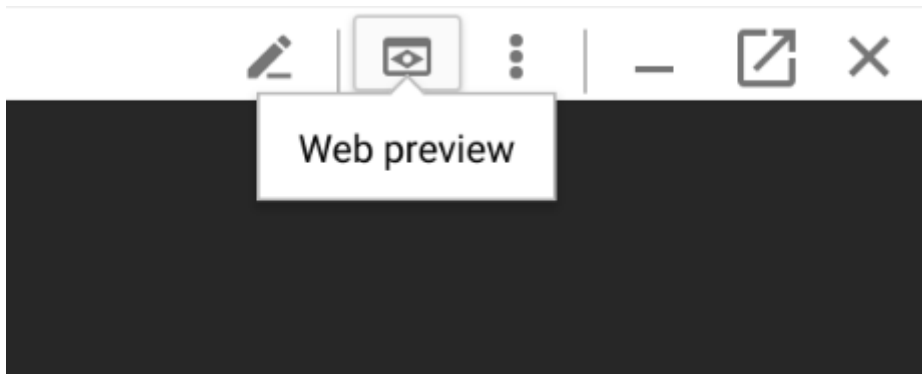
Look back at Cloud Shell and follow any prompts. If asked for an ssh passphrase, hit return (for no passphrase).

Step 5

If necessary, wait for Datalab to finishing launching. Datalab is ready when you see a message prompting you to do a **Web Preview**.

Step 6

Click on **Web Preview** icon on the top-right corner of the Cloud Shell ribbon.
Click **Change Port** and enter the port **8081** and click **Change and Preview**.




Note: If the cloud shell used for running the datalab command is closed or interrupted, the connection to your Cloud Datalab VM will terminate. If that happens, you may be able to reconnect using the command **datalab connect mydatalabvm** in your new Cloud Shell.

Clone course repo within your Datalab instance

To clone the course repo in your datalab instance:

Step 1

In Cloud Datalab home page (browser), navigate into **notebooks** and add a new notebook using the icon  **Notebook** on the top left.

Step 2

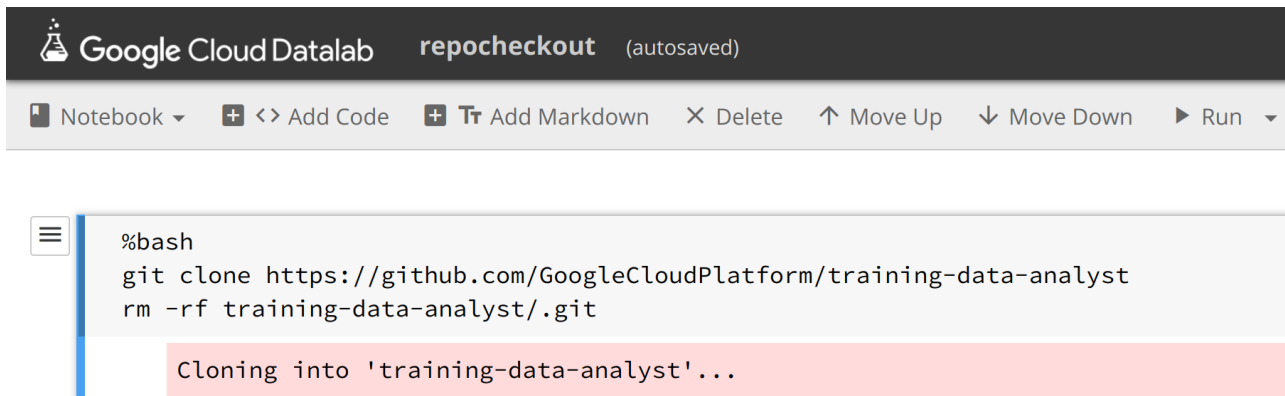
Rename this notebook as **repocheckout**.

Step 3

In the new notebook, enter the following commands in the cell, and click on **Run**(on the top navigation bar) to run the commands:

```
%bash
git clone
https://github.com/Goog
data-analyst
rm -rf training-
data-analyst/.git
```



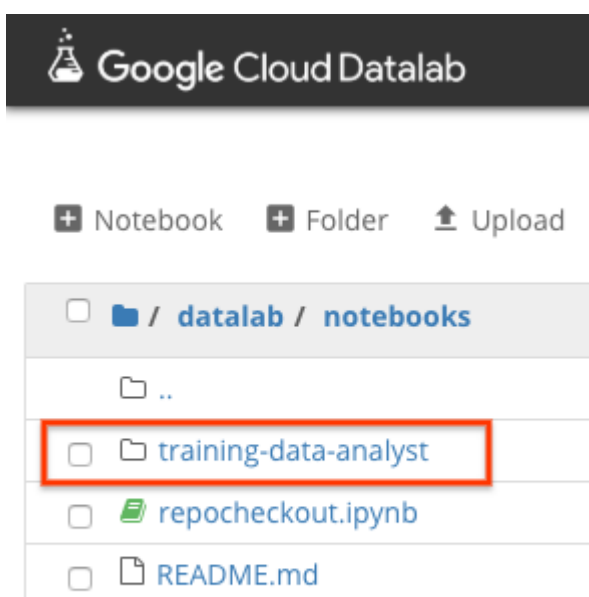


```
%bash
git clone https://github.com/GoogleCloudPlatform/training-data-analyst
rm -rf training-data-analyst/.git
```

Cloning into 'training-data-analyst'...

Step 4

Confirm that you have cloned the repo by going back to Datalab browser, and ensure you see the **training-data-analyst** directory. All the files for all labs throughout this course are available in this directory.



MNIST Image Classification

Duration is 15 min

This lab uses the same files as labs 2 and 3 (dnn, dnn_dropout models). The model code is packaged as a separate python module. You will first complete the model code and then switch to the notebook to set some parameters and run the training job.

Step 1

In Cloud Datalab, click on the **Home** icon, and then navigate to **datalab > notebooks > training-data-analyst > courses > machine_learning > deepdive > 08_image > labs > mnistmodel > trainer** and open **model.py**.

Note: If the cloud shell used for running the datalab command is closed or interrupted, the connection to your Cloud Datalab VM will terminate. If that happens, you may be able to reconnect using the command '**datalab connect mydatalabvm**' in your new Cloud Shell. Once connected, try the above step again.

Step 2

Scroll down to *cnn_model* where you have to replace the *#TODOs* with code to define this cnn model.

If you need more help, you may take a look at the complete solution by navigating to : **datalab > notebooks > training-data-analyst > courses > machine_learning > deepdive > 08_image > mnistmodel > trainer** and open **model.py**

Step 3

Now that you have defined your *cnn_model*, you are ready to run the training job.

In Cloud Datalab, click on the **Home** icon, and then navigate to **datalab > notebooks > training-data-analyst > courses > machine_learning > deepdive > 08_image > labs** and open **mnist_models.ipynb**.

Step 4

In Datalab, click on **Clear | Clear all Cells**.

Step 5

In the first cell, make sure to replace the project id, bucket and region with your qwiklabs project id, your bucket, and bucket region respectively. Also, change the MODEL_TYPE to *cnn*.

Step 6

Now read the narrative in the following cells and execute each cell in turn.

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.

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