

# [ML on GCP C9] Time Series Prediction with a Two-Layer RNN Model

2 hours

Free

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## Overview

*Duration is 1 min*

In this lab, you will define a Two-Layer RNN (Recurrent Neural Network) model to do time series prediction.

## What you learn

In this lab, you will learn how to:

- Create a Two-Layer RNN model for time series prediction
- Train and serve the model on Cloud Machine Learning Engine

## 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, **02:00:00** 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


START LAB

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**, **europa-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

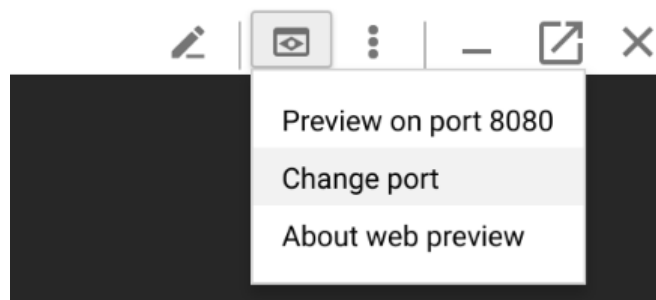
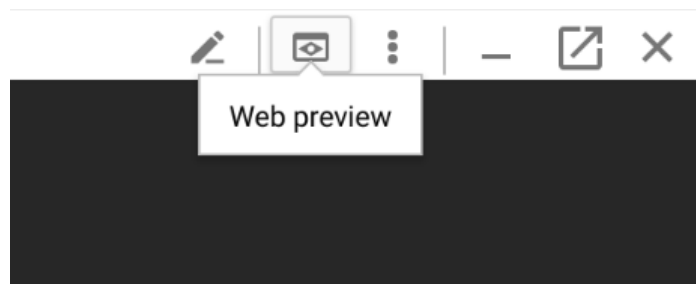
Look back at Cloud Shell and follow any prompts. If asked for an ssh passphrase, hit return (for no passphrase).

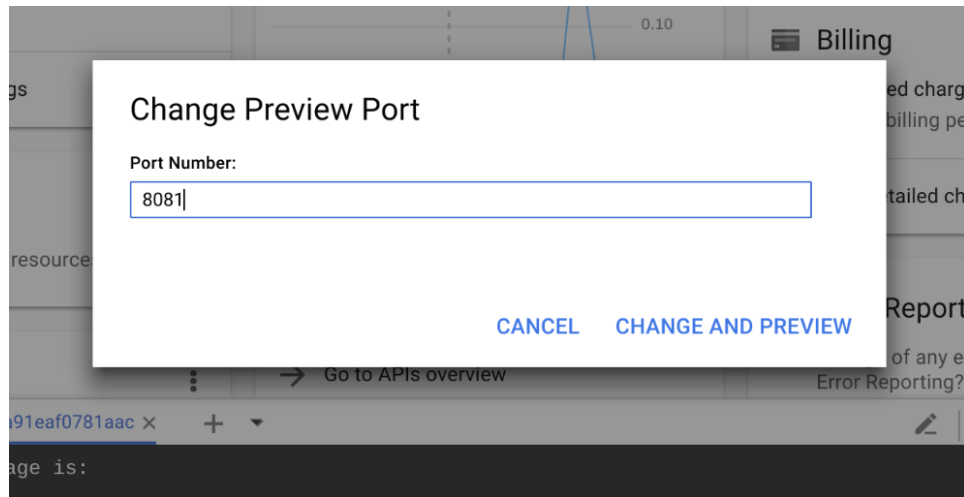
#### Step 5

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.

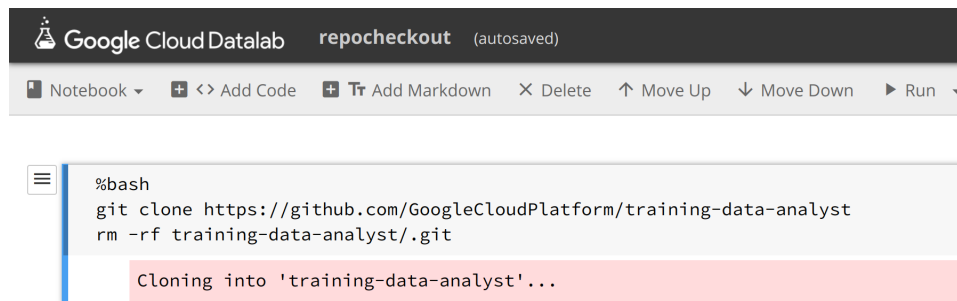
### Step 2

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/GoogleCloudPlat
data-analyst
rm -rf training-data-
analyst/.git
```

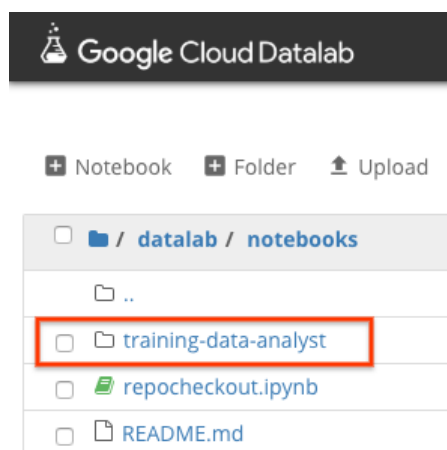


```
%bash
git clone https://github.com/GoogleCloudPlatform/training-data-analyst
rm -rf training-data-analyst/.git
```

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.



## Time Series Prediction with a Sequence Model

*Duration is 15 min*

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 > deeplive > 09\_sequence > labs > sinemodel** 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 the function called `rnn2_model`. Your task is to replace the `TODO` in the code, so that this function returns predictions for an RNN with multiple layers. To construct your model, make use of either the [LSTMCell](#) or [GRUCell](#) classes, the [MultiRNNCell](#) function, and the [dynamic\\_rnn](#) function.

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 > deeplive > 09\_sequence > sinemodel** and open `model.py`

## Step 3

Now that you have defined your Two-Layer RNN 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 > deeplive > 09\_sequence** and open `sinewaves.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 = rnn2` (linear is the default, be sure to change it)

## 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.

Last Tested Date: December 13, 2018

Last Updated Date: December 14, 2018

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