Recommendation Systems on Google Cloud

Course · 1 day
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Implementing a Content-Based Filtering using Low Level TensorFlow Operations

1 hour 30 minutes Free

Overview

This lab shows you how to use low-level TensorFlow commands to do content-based filtering.

Objectives

In this lab, you learn how to perform the following tasks:

- Create and compute a user feature matrix.
- Compute where each user lies in the feature embedding space.
- Create recommendations for new movies based on similarity measures between the user and movie feature vectors.

Introduction

In this lab, you provide movie recommendations for a set of users. Content-based filtering uses features of the items and users to generate recommendations. In this small example, you use low-level TensorFlow operations and a very small set of movies and users to illustrate how this occurs in a larger content-based recommendation system.

Task 1. 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.

Enable the Vertex AI API

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

Enable the Notebooks API

1. In the Google Cloud Console, on the **Navigation menu**, click **APIs & Services > Library**.
2. Search for **Notebooks API**, and press ENTER.
3. Click on the **Notebooks API** result.
4. If the API is not already enabled, click **Enable**.

Task 2. Launch a Vertex AI Notebooks instance

1. In the Google Cloud Console, on the **Navigation Menu**, click **Vertex AI > Workbench**. Select **User-Managed Notebooks**.
2. On the Notebook instances page, click **New Notebook > TensorFlow Enterprise > TensorFlow Enterprise 2.6 (with LTS) > Without GPUs**.
3. In the **New notebook** instance dialog, confirm the name of the deep learning VM, if you don't want to change the region and zone, leave all settings as they are and then click **Create**. The new VM will take 2-3 minutes to start.
4. Click **Open JupyterLab**.
   A JupyterLab window will open in a new tab.
5. You will see "Build recommended" pop up, click **Build**. If you see the build failed, ignore it.

Task 3. Clone a course repo within your Vertex AI Notebooks instance

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

1. In JupyterLab, to open a new terminal, click the **Terminal** icon.
2. At the command-line prompt, run the following command:

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

3. To confirm that you have cloned the repository, double-click on the training-data-analyst directory and ensure that you can see its contents.
   The files for all the Jupyter notebook-based labs throughout this course are available in this directory.

Task 4. Implement a content-based filtering using low level tensorflow operations

1. In the notebook interface, navigate to **training-data-analyst > courses > machine_learning > deepdive2 > recommendation_systems > labs**, and open **content_based_by_hand.ipynb**.
2. In the notebook interface, click **Edit > Clear All Outputs**.

3. Carefully read through the notebook instructions, and fill in lines marked with #TODO where you need to complete the code.

Tip: To run the current cell, click the cell and press SHIFT+ENTER. Other cell commands are listed in the notebook UI under **Run**.

- Hints may also be provided for the tasks to guide you. Highlight the text to read the hints, which are in white text.
- To view the complete solution, navigate to **training-data-analyst > courses > machine_learning > deepdive2 > recommendation_systems > solutions**, and open **content_based_by_hand.ipynb**.

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.