Preparation Instructions for"Deep Learning with Structured Data":

Hands-on Workshop: Training the Model from "Deep Learning with Structured Data"

This workshop is a follow-on to the April 29th Deep Learning with Structured Data session. In this live, 3-hour session you will have the chance to train a Keras deep learning model. By working through a series of practical exercises you will explore the Python code that builds and trains the model. Specifically, you will learn about:
- the difference between the Keras sequential and functional APIs
- how to build a pipeline derived from scikit-learn pipeline classes
- how to train a Keras deep learning model, including how to use callbacks to make the training process more efficient
- how to assess the performance of your deep learning model

Participants in the session will get access to a cloud environment where they can work through and experiment with the code. You will get the most out of the exercises if you have some experience with Python and Jupyter notebooks, but the session is open to anybody.

If you are curious about deep learning and want some direct, hands-on experience, this will be a fun opportunity to get a taste of this powerful technology.
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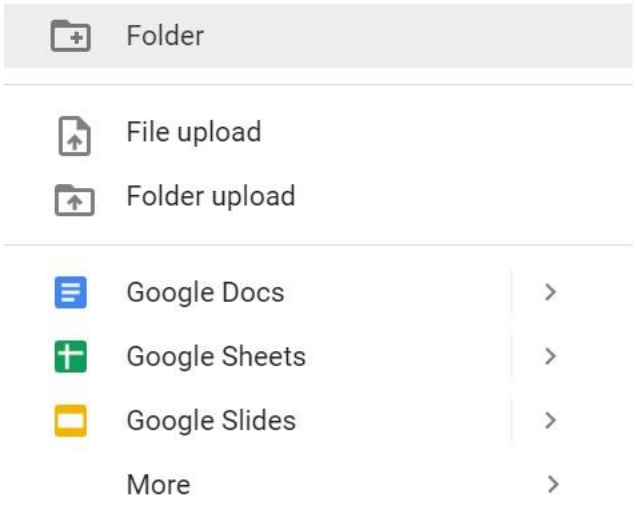
Prerequisites:

- Google ID – if you don't already have one, follow instructions here: https://support.google.com/accounts/answer/27441?hl=en
- Log into your Google account and confirm you have access to drive: drive.google.com

DETAILED INSTRUCTIONS FOR HANDS-ON SESSION PARTICIPANTS TO RUN THE MODEL TRAINING NOTEBOOK IN COLAB:

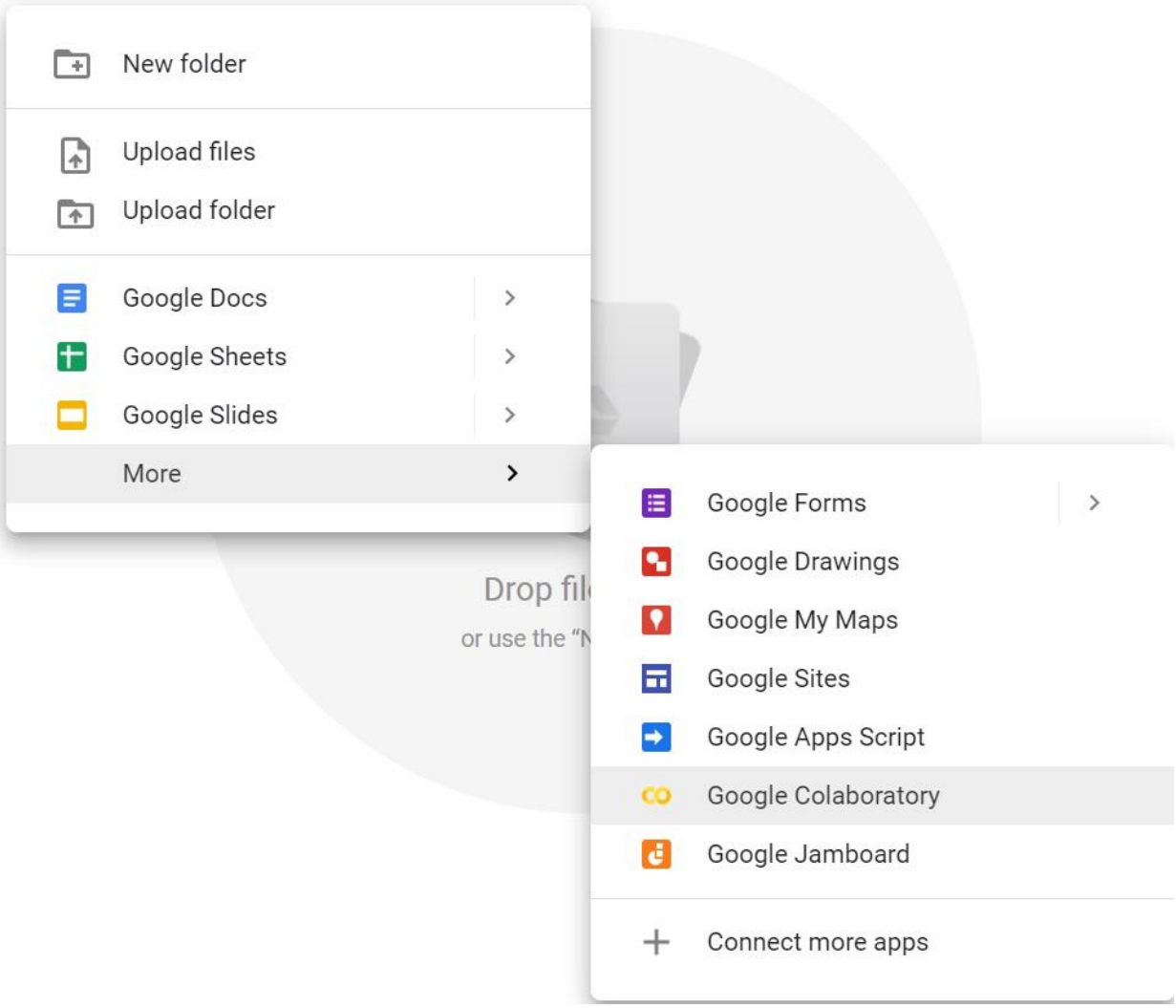
1. Go to Google Drive – ensure you are in the root directory

2. Create a new folder (let's call it the **dl_june_17**). Click on **New** and then **Folder** and provide a name

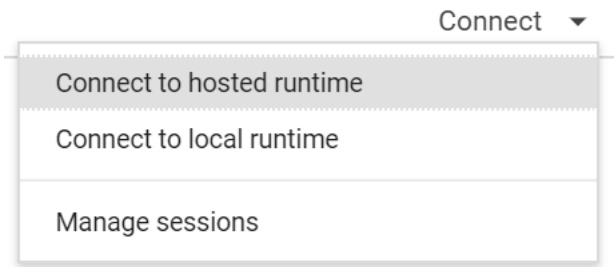


3. Access the **dl_june_17** folder that you just created. Right click on the background and select 'colaboratory' from the 'more'

option in the dropdown menu that appears with the right click.



4. **Colab** opens ups in a new tab. Go to the 'Connect' menu in the menubar and select 'Connect to hosted runtime':

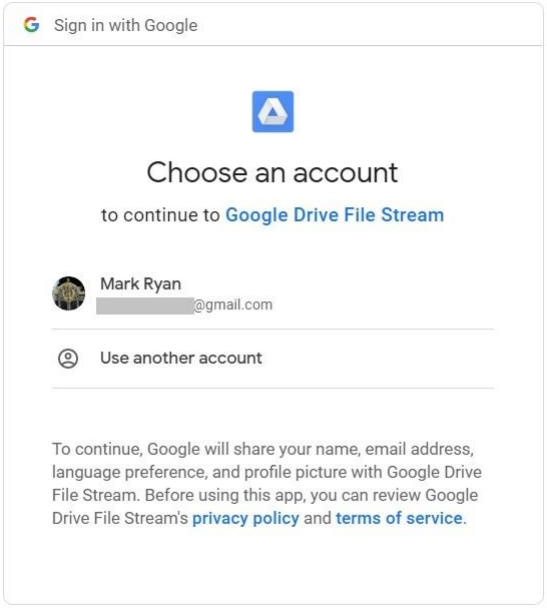


5. Mount the Google drive into this runtime – enter the following in a cell in the notebook that is open in Colab and click on run (the triangle icon at the left of the cell):

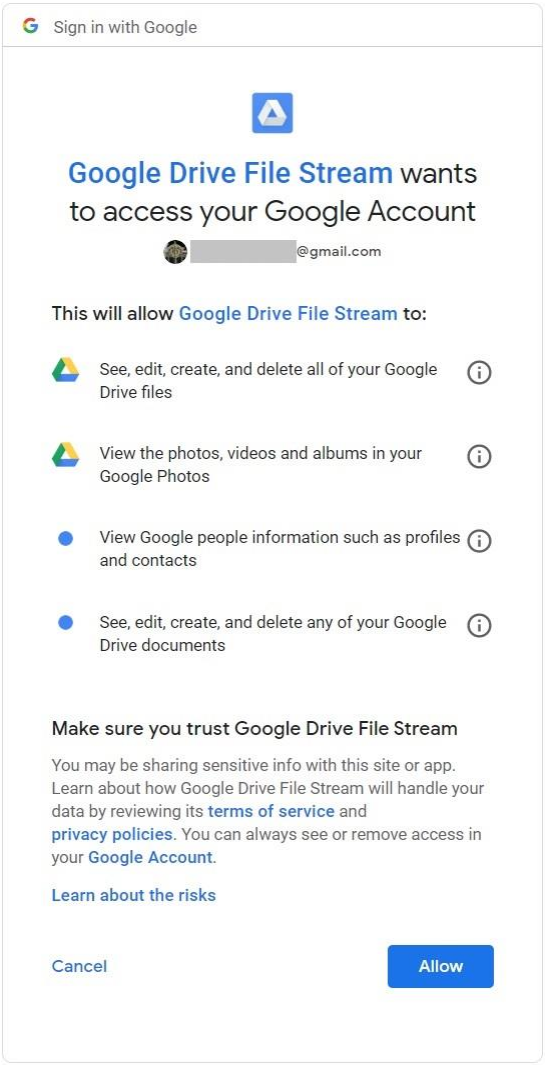
```
from google.colab import drive
drive.mount('/content/gdrive')
```

6. When you run these statements, you get the following. Click on the URL and follow the subsequent steps as shown

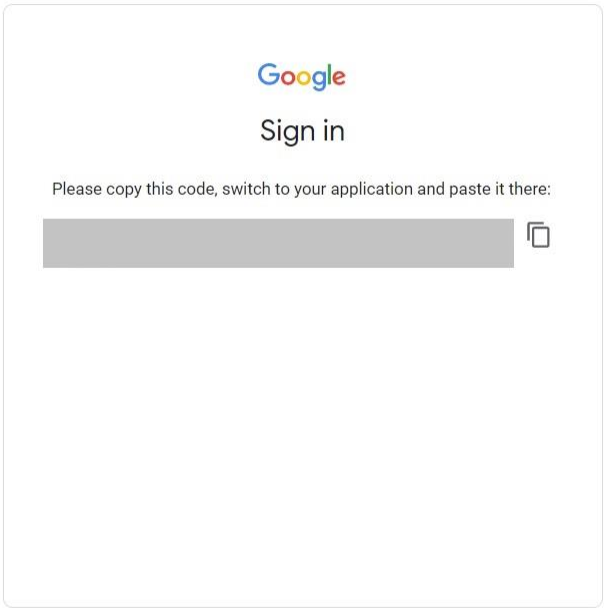
Click on the link to select an account:



In the screen for Google Drive File Stream access, click on **Allow**:



In the Sign In screen, click on the copy icon to copy your access code.



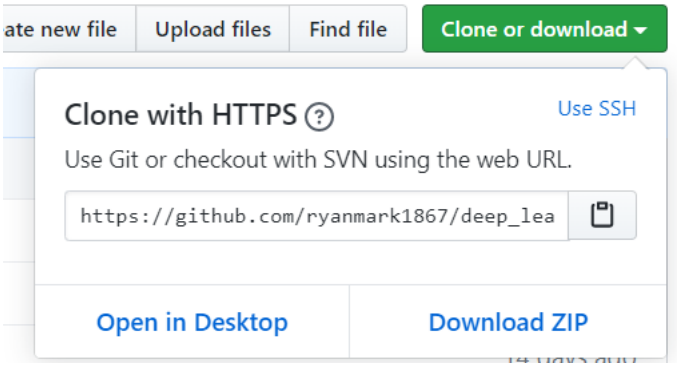
Now return to Colab, paste in the authorization code field and Enter:

The cell will run and produce the mounted message shown below to confirm that your Google Drive has been mounted and is available to your Colab notebook

7. To access the **dl_june_17** directory we created earlier in Driver, create a new cell in your notebook by clicking on **+code** and then copy and paste the following into the new cell and run it:

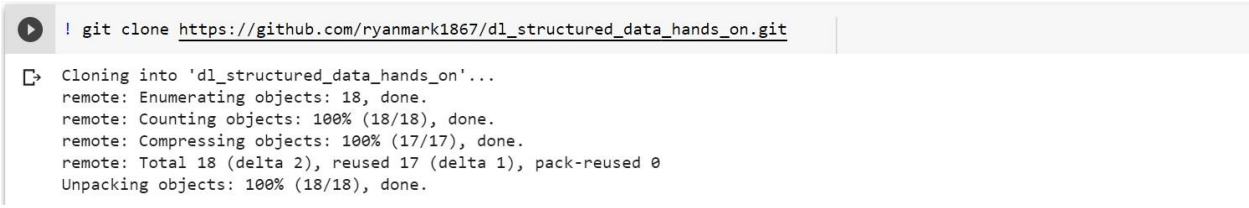
```
%cd gdrive/My Drive/dl_june_17
```

8. The following step will clone the repo for the exercise: https://github.com/ryanmark1867/dl_structured_data_hands_on

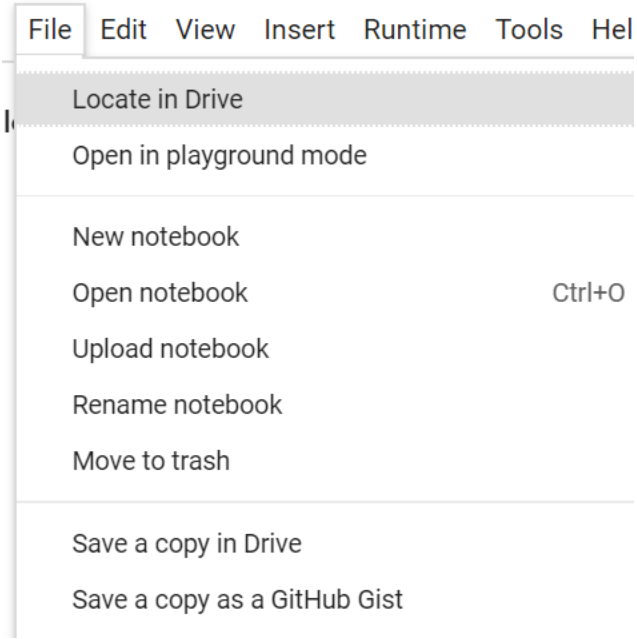


9. Create another new cell in your notebook in Colab and run the following to clone the hands-on deep learning for structured data repo:

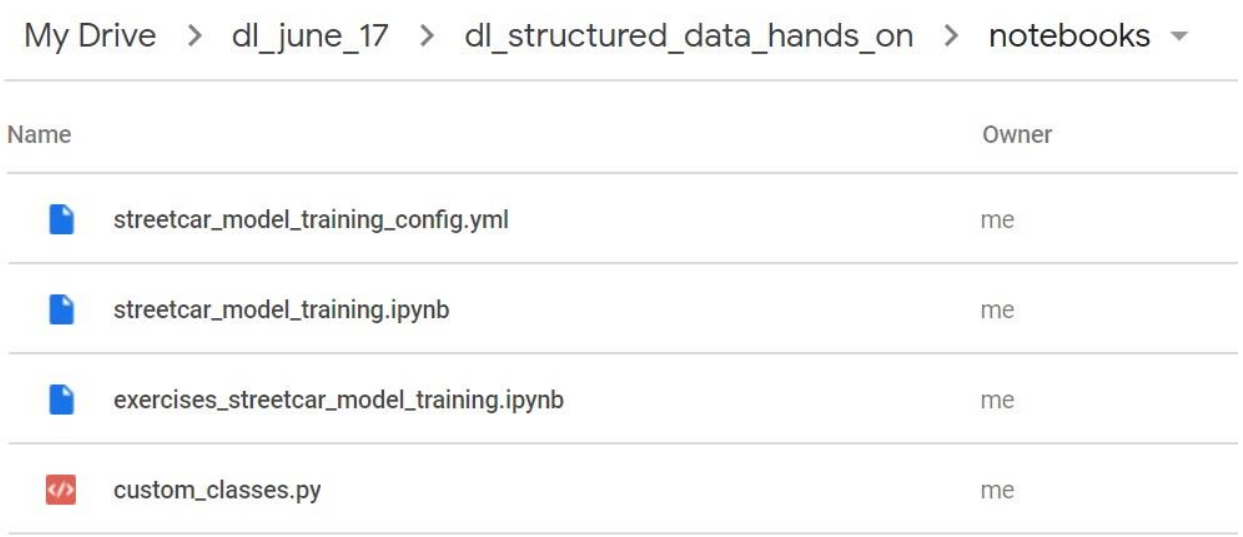
```
! git clone
https://github.com/ryanmark1867/dl_structured_data_hands_on.git
```



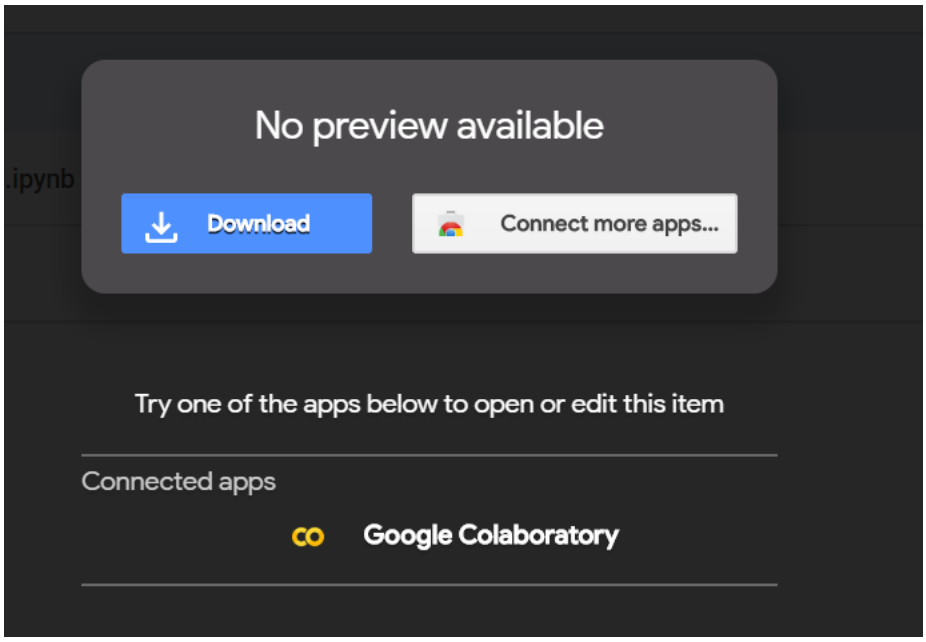
10. Click on File -> Locate in Drive



11. Navigate to the notebooks directory where you cloned the repo:



12. Double click on `streetcar_model_training.ipynb` and select **Google Colaboratory** in the screen that appears:



13. The notebook `streetcar_model_training.ipynb` opens up in Colab. Click on Connect -> Connect to Hosted Runtime

14. Add a new cell to the notebook you just opened in Colab and run the following in the new cell to connect to Drive, following the same authorization you followed in step 6.

```
from google.colab import drive
drive.mount('/content/gdrive')
```

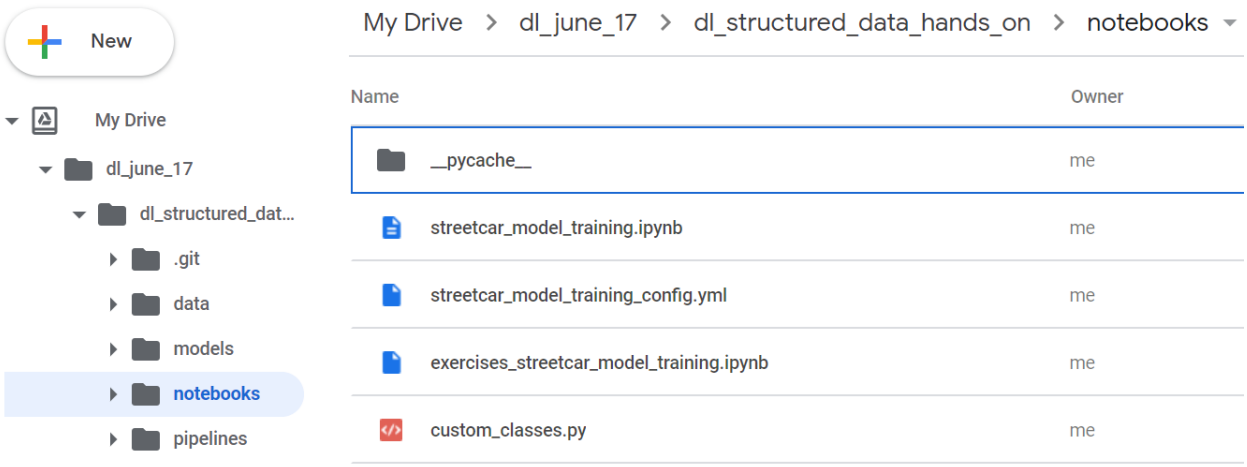
15. Add a new cell and run the following to make the `notebooks` directory in the cloned repo your current directory:

```
%cd /content/gdrive/My Drive/dl_june_17/dl_structured_data_hands_on/
notebooks
```

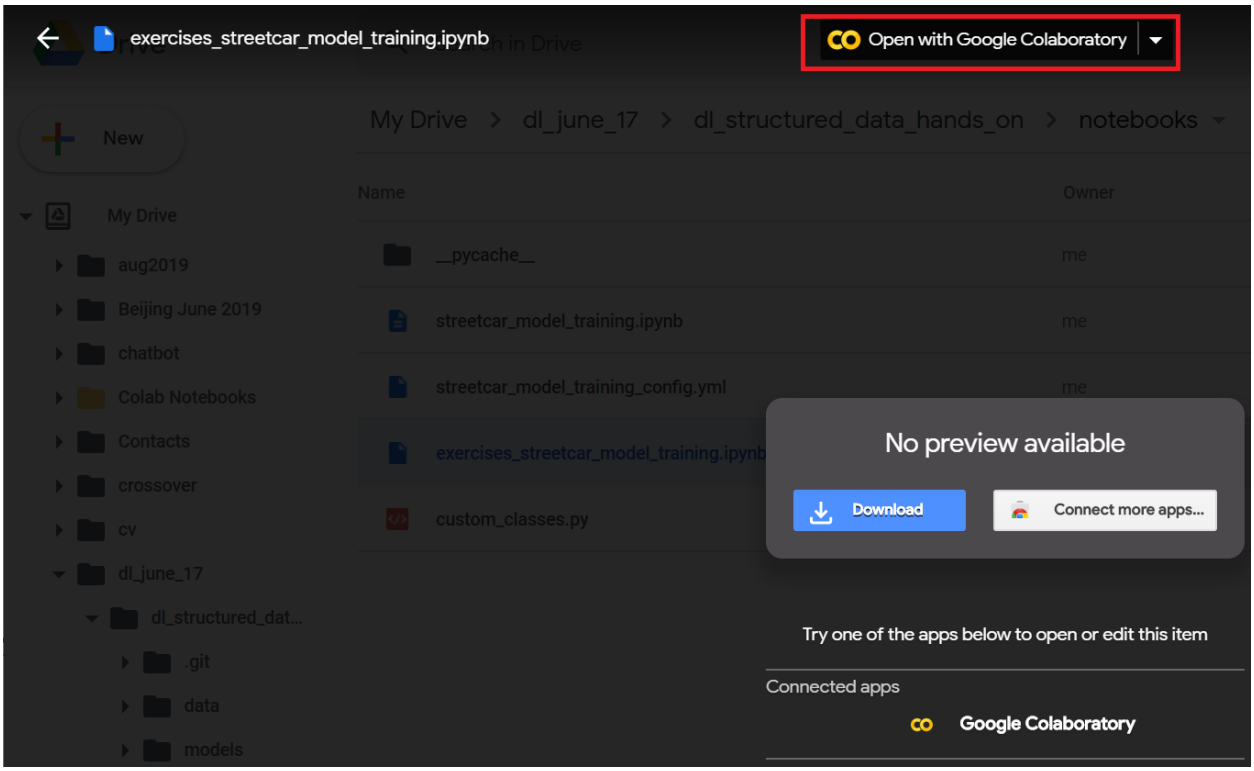
16. Now you should be able to run the notebook: **Runtime -> Run all**

SHORTCUTS TO RE-RUN NOTEBOOKS FROM THE REPO IN COLAB:

1. Once you have cloned the repo in Drive and run the notebook once, the numbered steps below are the shortcut steps to re-run notebooks from the repo. In summary:
    - Starting in Drive, open the notebook in Colab
    - In the notebook in Drive, run the cell to mount Drive for the notebook, then
    - Run the cell to set the current directory.
2. Go to drive and navigate to the `notebooks` directory in the clone of the repo and click on the directory name to show the files in the directory:



3. Double click on the notebook file that you want to open in Colab and then click on **Open with Google Colaboratory**:



4. The notebook opens in Colab. Now you need to take a few simple steps to be ready to run the notebook
5. Click on Connect -> Connect to hosted runtime
6. Add and run cells in the notebook to mount Drive and to make the notebooks directory your current directory

- Add a new cell to the notebook you just opened in Colab and run the following in the new cell to connect to Drive, following the same authorization you followed in step 6 of the main instructions.

```
from google.colab import drive
drive.mount('/content/gdrive')
```

- Add a new cell and run the following to make the `notebooks` directory in the cloned repo your current directory:

```
%cd /content/gdrive/My Drive/dl_june_17/dl_structured_data_hands_on/notebooks
```