### Getting started with the Model Asset Exchange and the Data Asset Exchange

In this lab, you will explore the Model Asset Exchange (MAX) and the Data Asset Exchange (DAX), which are two open source Data Science resources on IBM Developer.

### Objective of Exercise 1:

- Find open data sets on IBM Developer.
- Explore the data sets.

### Objective of Exercise 2:

- Find ready-to-use deep learning models on the Model Asset Exchange.
- Explore the deep learning model trained to detect objects in an image.

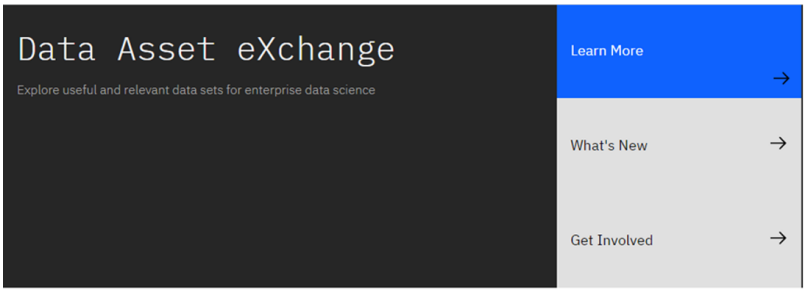
*It will take you approximately 30 minutes to complete the lab. Only a web browser is required to complete the tasks.*

## Exercise 1: Explore deep learning datasets

The Data Asset Exchange is a curated collection of open datasets from IBM Research and third-parties that you can use to train models.

1. Open https://developer.ibm.com/ in your web browser.

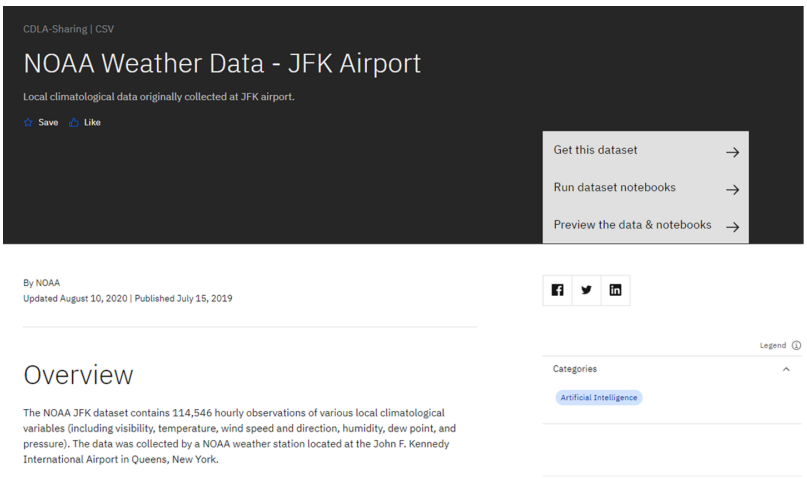
2. From the main menu select **Open Source at IBM > Data Asset eXchange**. The DAX home page is displayed.





The collection includes datasets from the Debater project (https://www.research.ibm.com/artificial-intelligence/project-debater/), datasets that can be used to train models to perform document layout analysis, natural language processing, time series analysis, and more.

3. Open the NOAA Weather Data dataset (https://developer.ibm.com/exchanges/data/all/jfk-weather-data/), which contains data from a weather station at the John F. Kennedy Airport in New York spanning eight years. This dataset was used to train the weather forecaster model on MAX (https://developer.ibm.com/exchanges/models/all/max-weather-forecaster/).

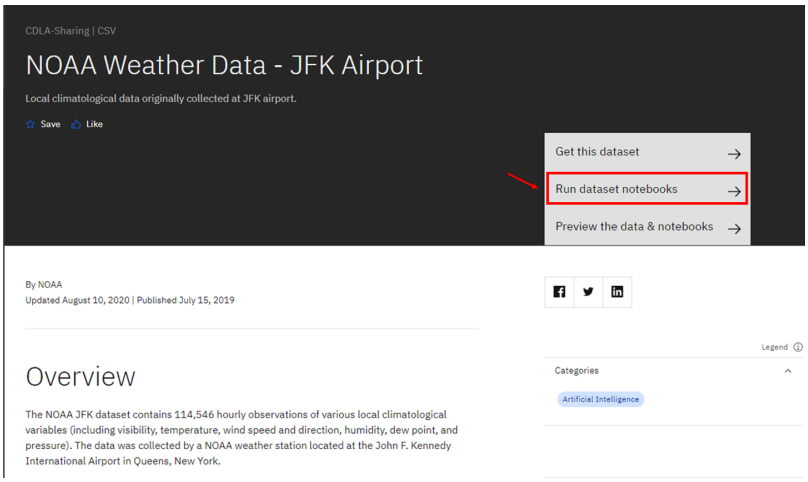



You can download the dataset using the **Get this dataset** link. Datasets are stored as compressed archives, which you can extract using any utility that supports the targz format. If you are not familiar with this file format, take a look at this short open source tutorial https://opensource.com/article/17/7/how-unzip-targz-file.

4. Inspect the dataset's metadata.

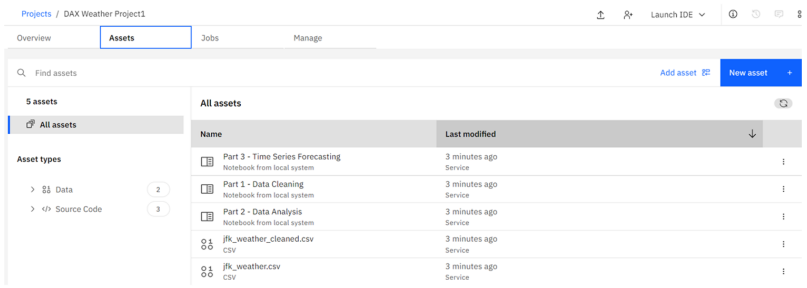
This dataset is stored as tabular data and formatted as a comma separated value (CSV) file, which is a very popular basic data exchange format.
The dataset was published under the data science friendly CDLA-Sharing license (https://cdla.io/).
The dataset contains time-series data and can be used to predict weather trends.

5. Most datasets are complemented by Python notebooks that you can use to explore, pre-process, and analyze the data. You can access the notebook (or notebooks) by clicking the **Run dataset notebooks**:




The notebooks are hosted on Watson Studio, IBM's Data Science platform. Later in this course, you'll learn more about Watson Studio notebooks and how to run them.

6. [Optional] If you are already familiar with notebooks and Watson Studio, feel free to open the link and import the project or notebook. The following example depicts the weather dataset project assets, which include the raw data file and two notebooks.



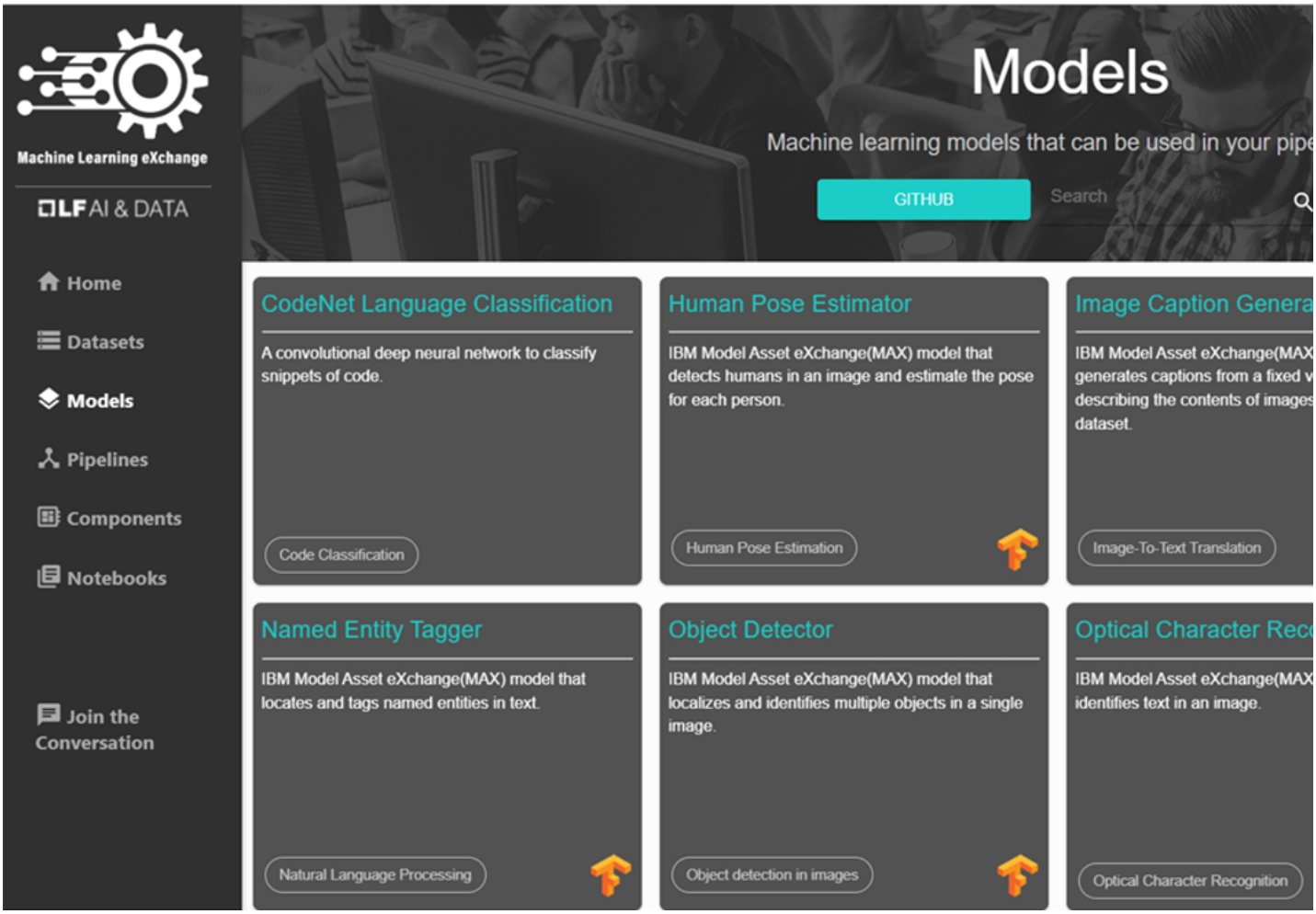

This concludes Exercise 1 of this lab, which introduced the Data Asset Exchange.

## Exercise 2 - Explore deep learning models

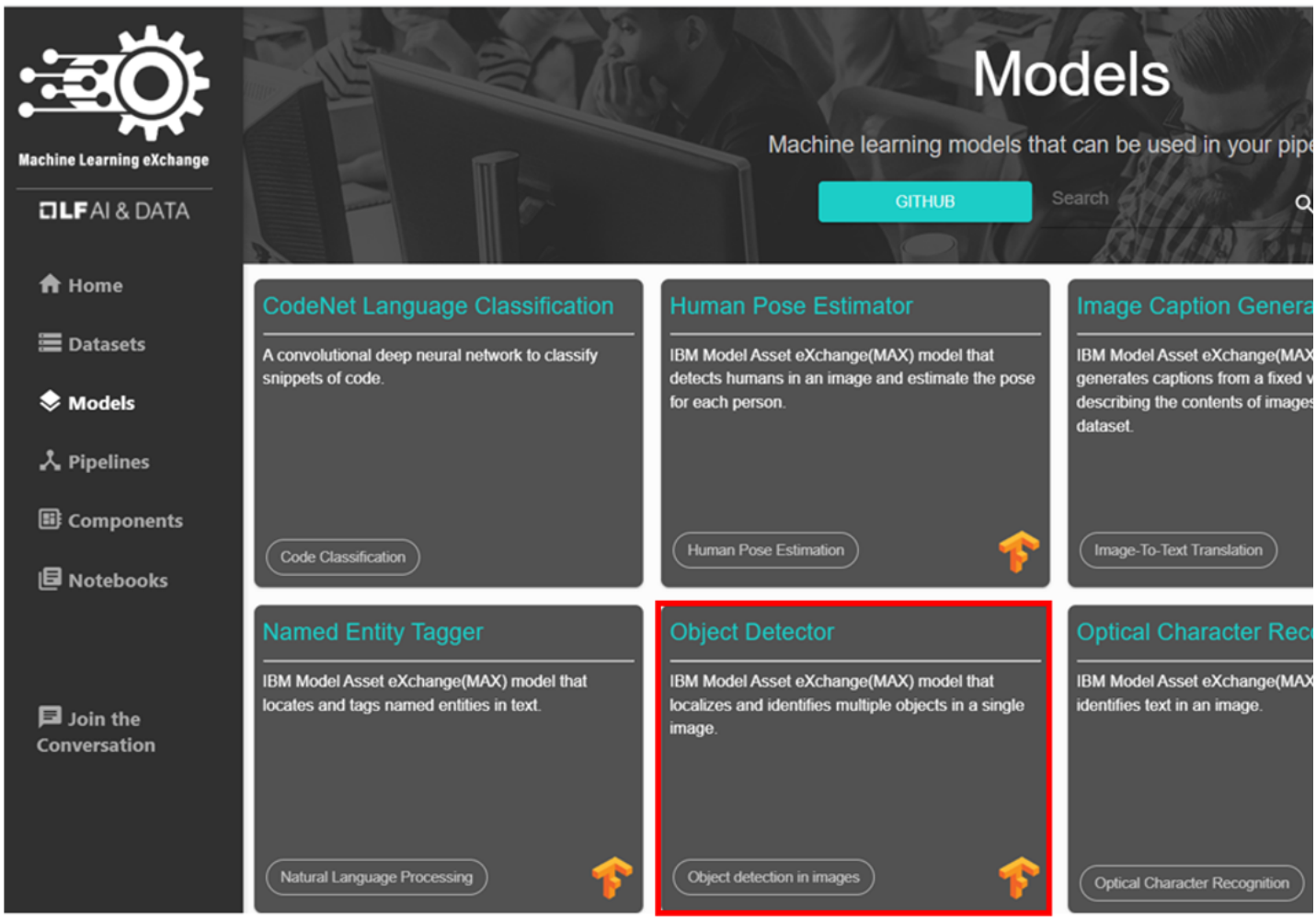
The Model Asset Exchange is a curated repository of open source deep learning models for a variety of domains, such as text, image, audio, and video processing.

1. Open http://ml-exchange.org/models in your web browser.

2. The MAX home page is displayed. *In this introductory lab exercise, we are going to focus on a few MAX key features.*

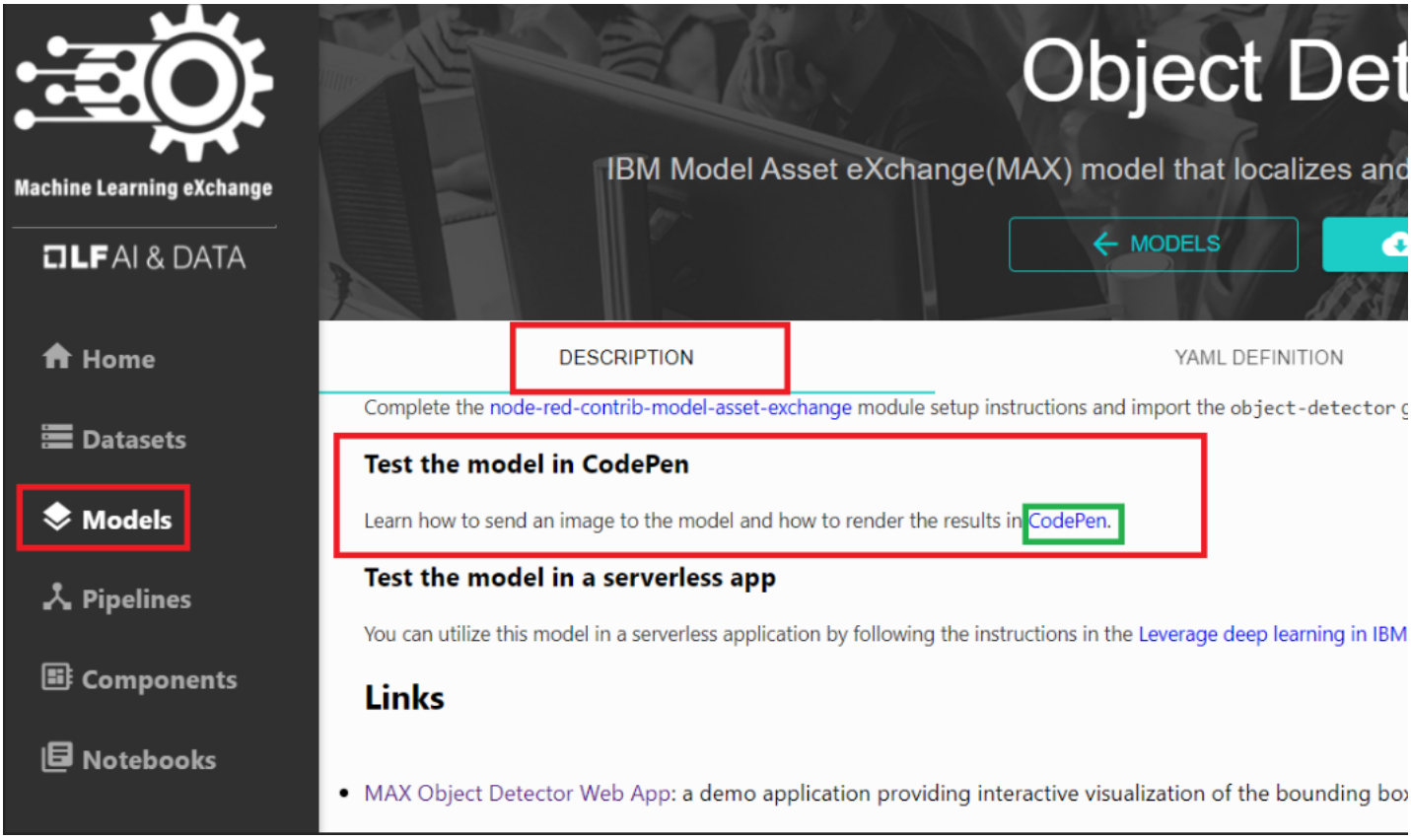



3. Select the **Object Detector** model from the list of available options.



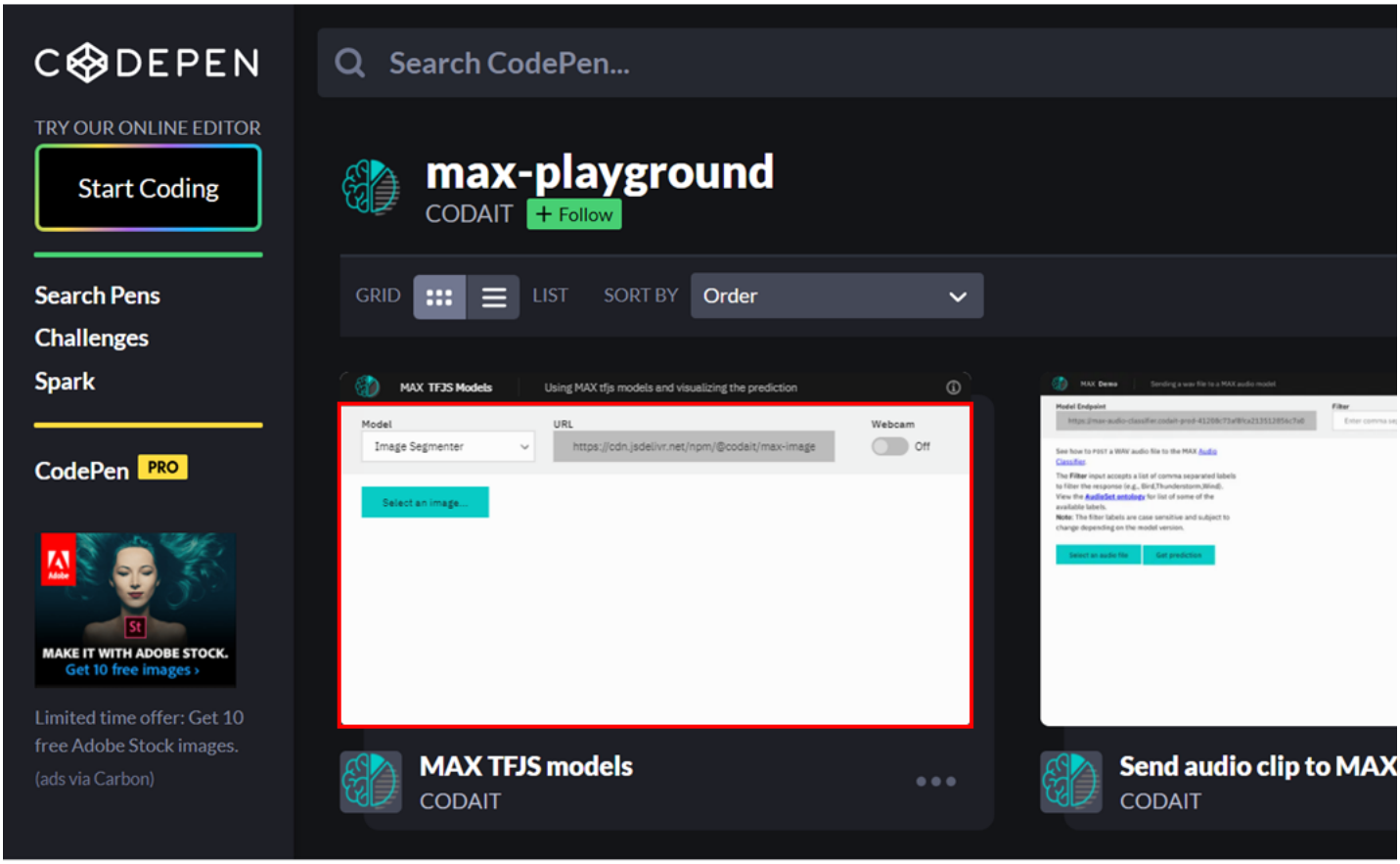
This model recognizes the objects present in an image. The model consists of a deep convolutional net base model for image feature extraction, together with additional convolutional layers specialized for the task of object detection, trained on the COCO data set. The input to the model is an image, and the output are extracted objects from the image, appropriately labeled.

4. Scroll down and in **Test the model in CodePen** click **CodePen** hyperlink as highlighted below:



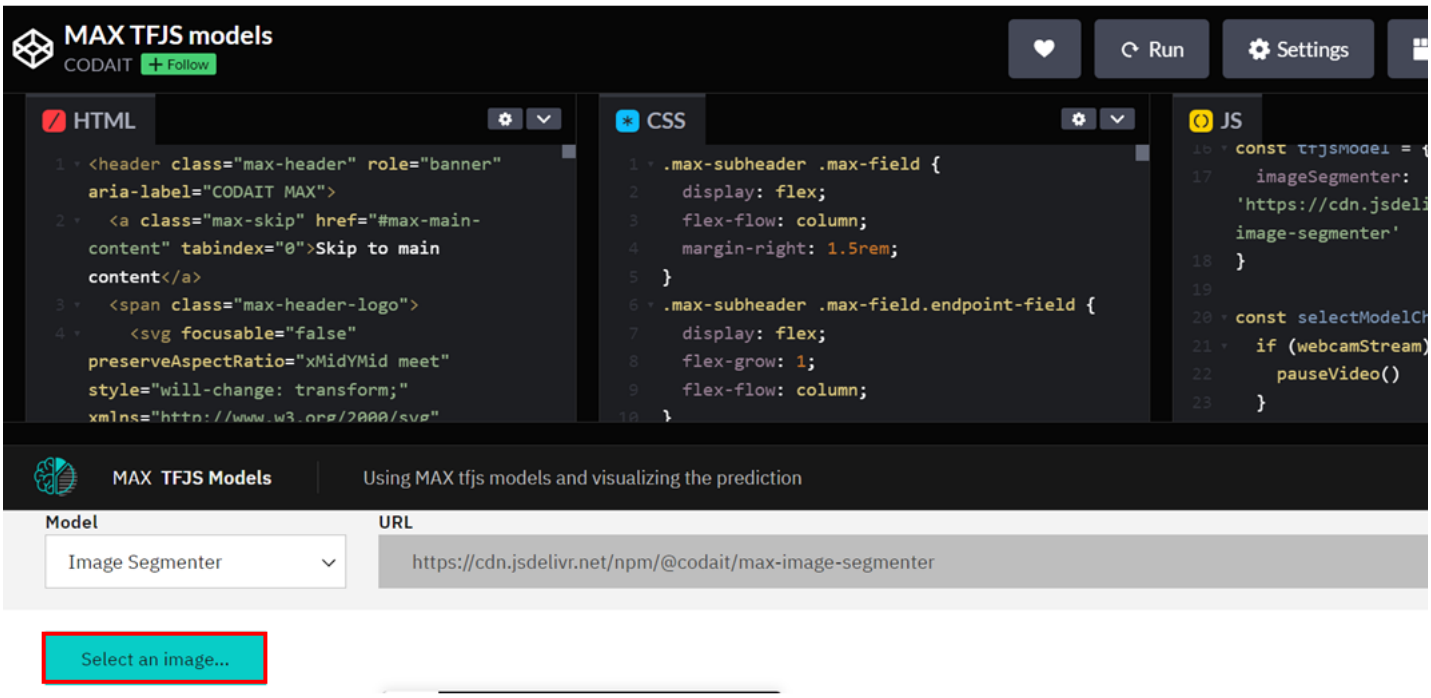

CodePen is a social development environment. At its heart, it allows you to write code in the browser and see the results of it as you build. It is a useful and liberating online code editor for developers of any skill and is particularly empowering for people learning to code.

Some of the models are already built for you to test. Let's test one of the models. Click **MAX TFJS models**.



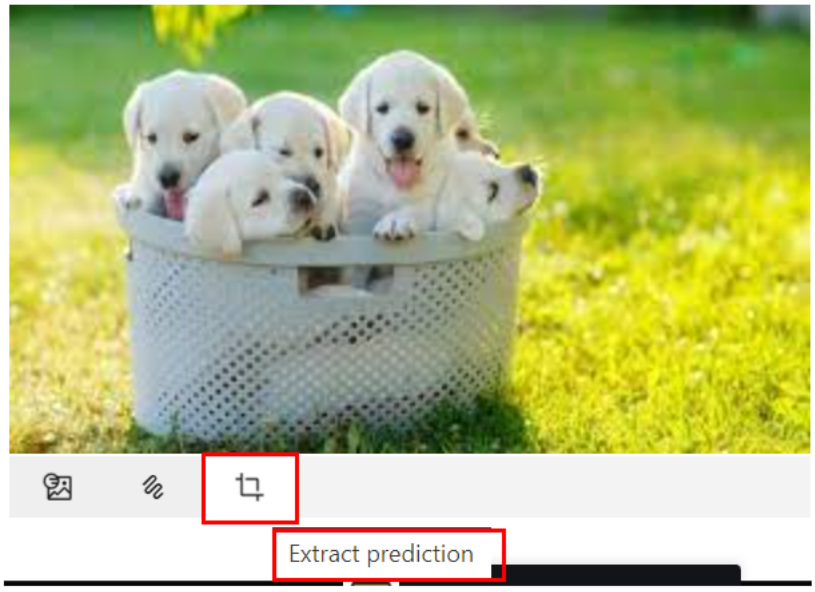

5. Upload an image. You may choose images with a person, dog, cat, truck, car, and so on, which are labels the model has been trained on.

▶ Click here for all the labels the model is trained on




Here we are using **Image Segmenter**, which divides an image into regions or categories that correspond to different objects or parts of objects. Every pixel in an image is allocated to one of a number of these categories.

6. Click the icon **Extract prediction** as shown below:




You will now be able to see the output of the prediction on the basis of the image you upload.

Here the background and the dog image are separated, showing two different parts of the image. **You can also try the webcam option, which will show the real-time prediction by the toggle-on webcam option.**

This concludes Exercise 2 of this lab, which introduced the Model Asset Exchange.

Optionally you can watch a demo of the Object detector model here.

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## Changelog

| Date | Version | Changed by | Change Description |
|---|---|---|---|
| 2022-01-04 | 2.6 | Steve Hord | Final QA pass |
| 2022-12-27 | 2.5 | Steve Hord | QA pass with edits |
| 2022-04-19 | 2.4 | Malika | Updated the screenshot |
| 2022-03-14 | 2.3 | Malika | Updated the screenshot |
| 2022-01-08 | 2.2 | Malika | Added exercise CodePen |
| 2022-01-07 | 2.1 | Malika | Removed exercise 1 |
| 2020-08-25 | 2.0 | Lavanya | Migrated Lab to Markdown and added to course repo in GitLab |