**Optical character recognition (OCR)**

Optical character recognition (OCR) is the process of recognizing characters from images using computer vision and machine learning techniques. This reference app demos how to use TensorFlow Lite to do OCR. It uses a combination of [text detection model](https://tfhub.dev/sayakpaul/lite-model/east-text-detector/fp16/1) and a [text recognition model](https://tfhub.dev/tulasiram58827/lite-model/keras-ocr/float16/2) as an OCR pipeline to recognize text characters.

## **How it works**

OCR tasks are often broken down into 2 stages. First, we use a text detection model to detect the bounding boxes around possible texts. Second, we feed processed bounding boxes into a text recognition model to determine specific characters inside the bounding boxes (we also need to do Non-Maximal Suppression, perspective transformation and etc. beforing text recognition). In our case, both models are from TensorFlow Hub and they are FP16 quantized models.

## **Limitations**

* The current [text recognition model](https://tfhub.dev/tulasiram58827/lite-model/keras-ocr/float16/2) is trained using synthetic data with English letters and numbers, so only English is supported.
* The models are not general enough for OCR in the wild (say, random images taken by a smartphone camera in a low lighting condition).

So we have chosen 3 Google product logos only to demonstrate how to do OCR with TensorFlow Lite. If you are looking for a ready-to-use production-grade OCR product, you should consider [Google ML Kit](https://developers.google.com/ml-kit/vision/text-recognition). ML Kit, which uses TFLite underneath, should be sufficient for most OCR use cases, but there are some cases where you may want to build your own OCR solution with TFLite. Some examples are:

* You have your own text detection/recognition TFLite models that you would like to use
* You have special business requirements (i.e., recognizing texts that are upside down) and need to customize the OCR pipeline
* You want to support languages not covered by ML Kit
* Your target user devices don’t necessarily have Google Play services installed