**Objective**

Use transfer learning and TensorFlow 2 to train at least 2 models on the Food 101 data set. The purpose is to get experience using a pre-trained model and learn how to evaluate models based on accuracy, number of parameters, training time, and model size.

**Importance to project**

* The output from the image classifier you’ll train in Milestone 1 is a model file, which will be used as input to Milestones 2 and 3, to deploy the web and mobile applications.
* Transfer learning is an important technique in deep learning, as it allows you to use state-of-the-art models trained on large data sets and optimize them for your problem.
* Not all model architectures are optimized for every use case, such as reduced latency versus highest accuracy.
* In this milestone, we will evaluate a regular model like VGG19 vs. a mobile-optimized model, such as MobileNetV2. Then, we’ll evaluate them on criteria like accuracy, model size, and time.
* Our goal in this project is to create web and mobile applications. We will try different architectures and models, compare them, and choose a model that works best for deployment in terms of speed and size.

**Subsetting the data**

The full dataset has 101 classes (5GB), which will take some time to run. You will want to subset your data for a couple of reasons:

1. You can reduce training time while experimenting and tweaking the code. This is a good practice in any data science project.
2. You can save computing costs by reducing GPU time. In practice, you or your company would be paying for a GPU server and training on a smaller data set while experimenting saves costs. In our case, we will move the notebook to nautilus NRP Jupyter notebooks.

Begin by training three classes. Once the code is closer to completion, you can increase the number of classes of the data set.

1. Download the [subset](https://protect.checkpoint.com/v2/r01/___https://lp-prod-resources.s3-us-west-2.amazonaws.com/tymjwdIjuqtDnsl+f+Ijju+Qjfwsnsl+Rtijq+ts+1jg+fsi+Rtgnqj+Fuuqnhfyntsx+Zxnsl+YjsxtwKqtBdKtti+656+-+Ifyf+Xzgxjy.Enu___.YzJ1OmZhbXU6YzpvOjc1MDYzZWIyYjYxYmFjZWY4YmZhYTBjOGRmODM4YTYwOjc6NDYxNzo0NDgxOTIwNDg5NTZiMTM3ZWRmOWFmZmNlMWFjNzdmOTg1OGUxNDI2MDhlNGZmYTVmNGJhOTdhMWM4OTFkYjFlOnA6VDpU) of the Food-101 dataset.
2. The subset is composed of 3 classes (apple\_pie, caesar\_salad, falafel). The size of the file is 154MB.

Did you have your research problem? We have to change the culinary context for this project.