Data Pre-Processing

Objective: To read data from the hard disc into RAM (CPU/GPU)

Problems:

- 1. Dataset size may be in the range of 100s of GBs, but RAM memory is generally much lesser (10s of GBs).
- 2. If you write code to read subsets of data and train the model on that, the process of reading data may significantly slow down the overal process.

Solution:

- **1.** Use the "ImageDataGenerator" class defined in Keras.
- **2.** This class runs a background thread to load data into RAM.
- **3.** This class should return a batch of training data and labels.

Reference:

Cells 4, 5, and 6 in the example code.

Model Definition

Objective: To define the architecture of the Deep Learning Model. This includes defining layers and the relevant hyperparameters.

Model Compilation

Objective: To prepare the model for training by defining the following attributes

- 1. Loss function
- 2. Optimizer
- 3. Metrics

Option 1:

Use the Keras Sequential Model and build your model layer by layer. (Refer Cell 7)

Option 2:

Use the Keras Functional Model. (Not discussed yet)

Reference:

Cell 7

Reference: Cell 8

Training

Objective: To perform gradient updates using backpropagation. This is where all the previous steps come together.

Solution:

- **1.** Keras implements backpropagation under the hood.
- 2. Use the "fit_generator" funtion from Keras. This function will be called from the "model" object.

Reference:

Cell 9