

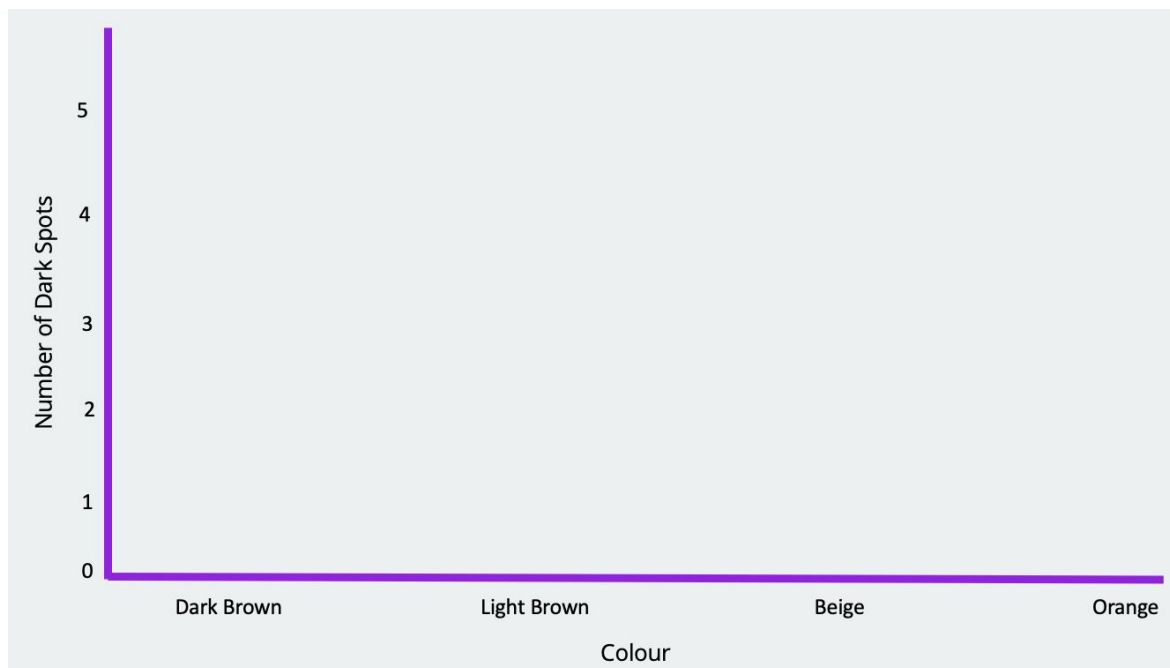
MUFFIN OR CHIHUAHUA

INSTRUCTOR GUIDE

Machine Learning is perceived as this scary difficult topic. This is a guide on how to **Linear Regression**; the simplest yet most commonly used method for training machine learning models. In 4 easy steps you will be able to explain it to anyone!

STEP 1: Setting up Axes

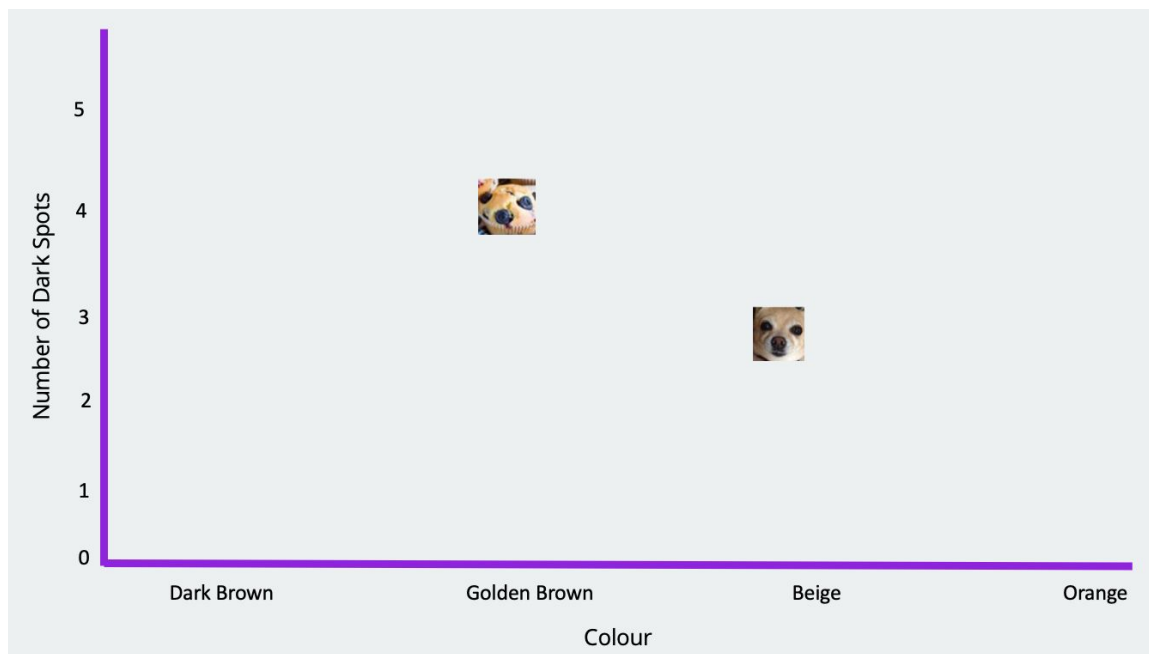
We need to look for ways to classify the images. These need to be measurable attributes about each image. In this example I have chosen the color of the muffin or chihuahua and the number of dark or black spots.



STEP 2: Adding Data

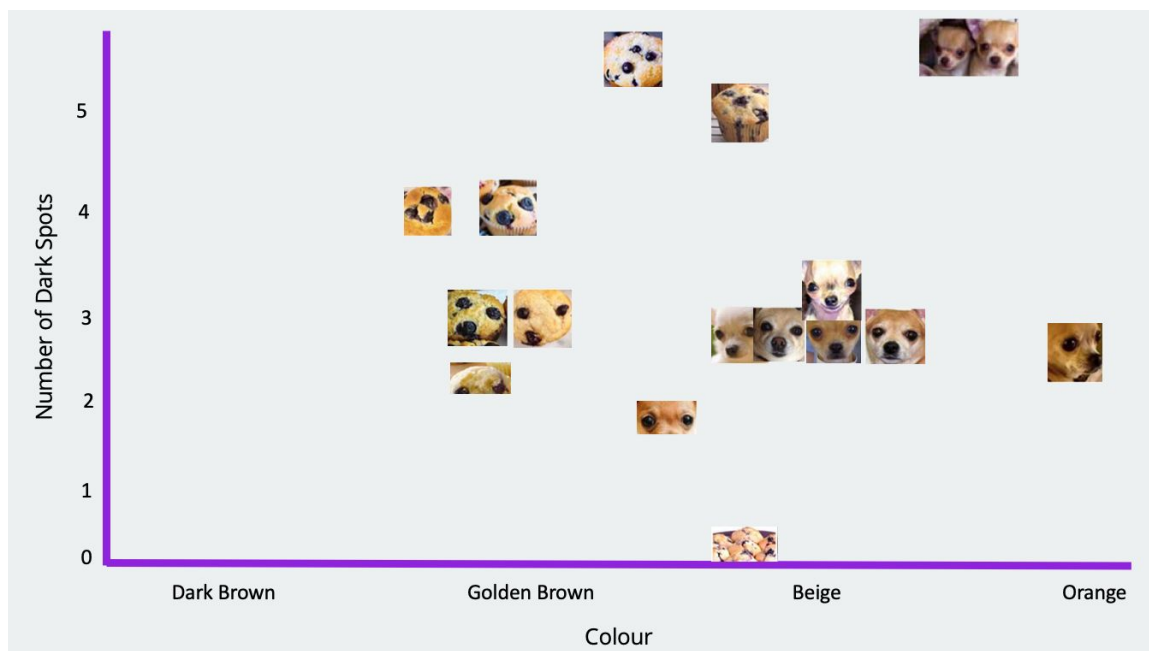
Next, we need to add our images on to the graph! Choosing a diverse set of images will make the model more accurate. This means choosing 50% chihuahua photos and 50% muffins. Furthermore, choosing images with a variety of lighting and backgrounds! The

more diverse the set of photos the better the model.



STEP 3: Adding More Data

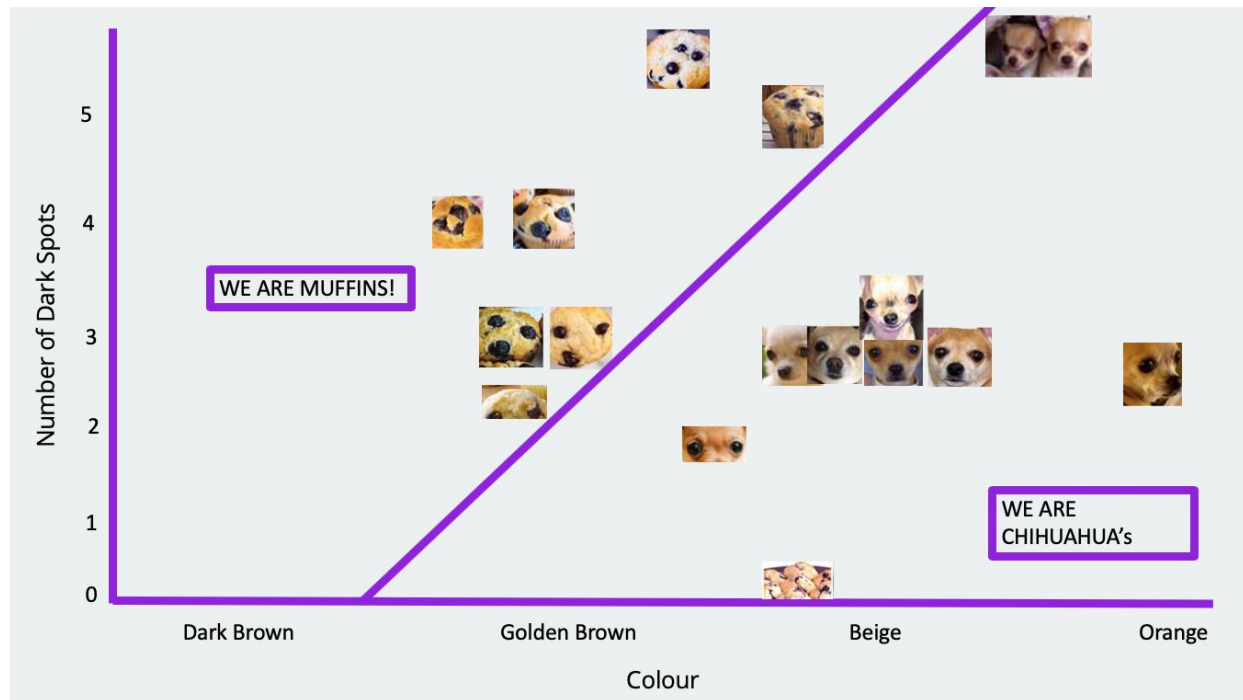
Pretty self explanatory! The more images (or examples) the model is trained with the better the result.



STEP 4: Adding a Line of Best Fit

This is the step which makes machine learning so powerful. As of right now our graph looks very random. Since we are training we know which image is a muffin and which is a chihuahua and our goal is to have our computer be able to distinguish the two.

If we look closer at our set of data, there is a pattern. We can draw a line that separates the muffins from the chihuahua's! Machine Learning is all about picking the best line to separate the two. The math involved (Gradient Descent or Linear Least of Squares) in calculating this is well outside the scope of the workshop but there are many online resources for learning about it.



STEP 5: Test

We have now successfully trained our computer on learning to distinguish between a chihuahua and muffins. Everytime we ask the computer "Am I looking at a chihuahua or a muffin" the computer graphs the image and checks which side of the line it is on! In 5 steps you now know the process for how most machine learning models are trained!

