

# Cat Image Recognition model theory

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## 1 Setup

- Load image datasets from '.h5' files. (Cat image datasets sourced from <https://github.com/marcopeix>)
  - Where each image in the input dataset, is represented by an R, G and B matrix, to store the RGB values of each pixel in the 64x64 pixel images
  - Each image's RGB matrices are then 'flattened' into a 1 dimensional array of values, where each element is also divided by 255 (max RGB value) to a number between 0 and 1, to standardize the dataset
  - The output dataset is also loaded, and is reshaped into a 1 dimensional array of 1s and 0s, to store the output of each image (1 for cat, 0 for non cat)
- There is a training dataset with 209 pictures and a test dataset with 50 pictures (fewer pictures are needed for testing)
- Afterwards, the weights and the bias are all initialised to zero/s

## 2 Model

This cat image recognition model uses a Perceptron Artificial Neural Network model, with the RGB values as the input array, and uses the sigmoid transfer function to obtain a single output neuron/prediction between 0 and 1 (where a prediction greater than or equal to 0.5 predicts cat), for a binary classification of 'cat' or 'not a cat'