

## Ex9: Logistic Regression with a Neural Network mindset

You will build a logistic regression classifier to recognize cats. This assignment will step you through how to do this with a Neural Network mindset, and so will also hone your intuitions about deep learning.

You will learn to

- Build the general architecture of a learning algorithm, including:
  - Initializing parameters
  - Calculating the cost function and its gradient
  - Using an optimization algorithm (gradient descent)
- Gather all three functions above into a main model function, in the right order.

### Problem Statement:

You are given a dataset (in H5 format) containing:

- a training set of  $m_{\text{train}}$  images labeled as cat ( $y=1$ ) or non-cat ( $y=0$ )
- a test set of  $m_{\text{test}}$  images labeled as cat or non-cat
- each image is of shape  $(\text{num\_px}, \text{num\_px}, 3)$  where 3 is for the 3 channels (RGB). Thus, each image is square ( $\text{height} = \text{num\_px}$ ) and ( $\text{width} = \text{num\_px}$ ).

You will build a simple image-recognition algorithm that can correctly classify pictures as cat or non-cat.

### Instructions:

- **Fill in the code blocks of Python script `ex9.py` that are marked with `### START CODE HERE ###` and `### END CODE HERE ###`.** The detailed instructions are specified as comments in `ex9.py`.
- Do not use loops (`for/while`) in your code, unless the instructions explicitly ask you to do so.