Deep Learning: Breaking CAPTCHA

CAPTCHAs (Completely Automated Public Turing test to tell Computers and Humans Apart) are distortions of texts or image. They are meant to be recognizable to most humans but can become difficult for computers to recognize. They often contain some noise or lines to make it harder to recognize. The aim of this assignment is to use Deep Learning to break CAPTCHAs. We have used a Convolutional Neural Network after creating training data. The network has three convolution layers and two full-connected layers. We have also added dropouts after max pooling in each layer to avoid overfitting. Also it must be mentioned that the model has been built with Keras which provides us with really easy to use and well-established framework.

We did Three different experiments. First, Captcha with one letter or number and second Captcha with two letters or numbers and three Captcha with three numbers. As expected the results were much more satisfying in the first case.

HOW TO RUN :

Requirements: Keras, Tensorflow, Captcha and Numpy

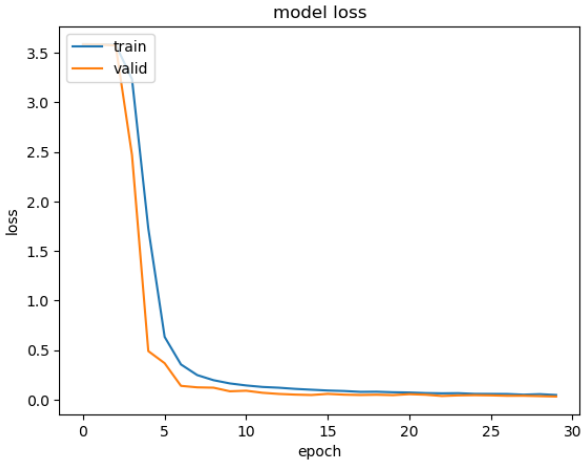
1. First we need to build dataset or use a suitable dataset. In our case, we built the dares set ==> building_data.py it will build a “data” folder in the directory and contains images with their labels.

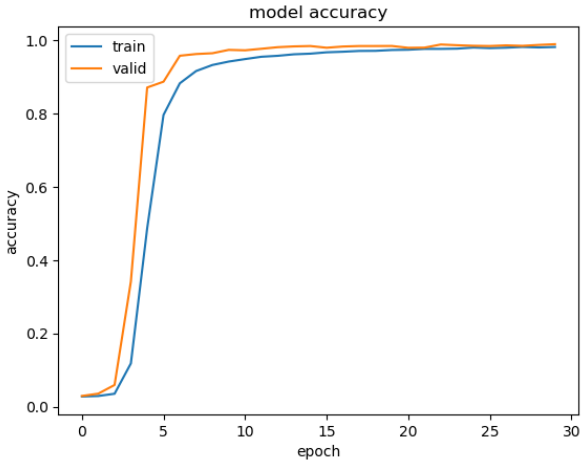
2. To train and evaluate our model ==> train_eval.py

Results:

1. Captcha with one letter or number (Acuraccy: ~98% on train and validation set)

18000 test and validation set, 6000 test set

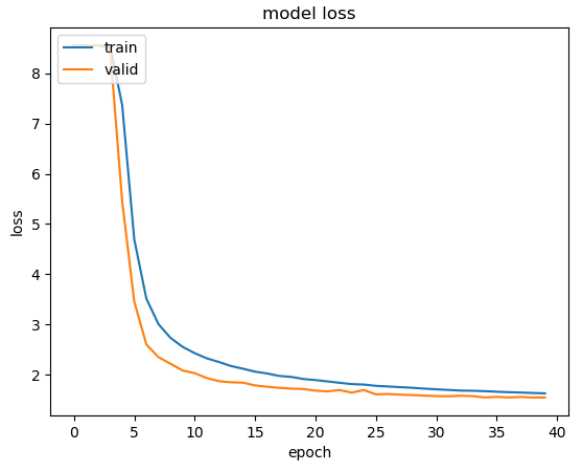


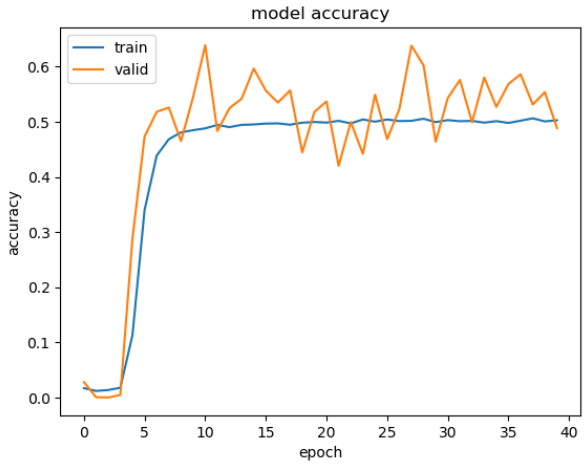


on test data : loss: 0.0312 & acc: 0.9893

2. Captcha with two letters or numbers (Acuraccy: ~55% on train and validation set)

18000 test and validation set, 6000 test set

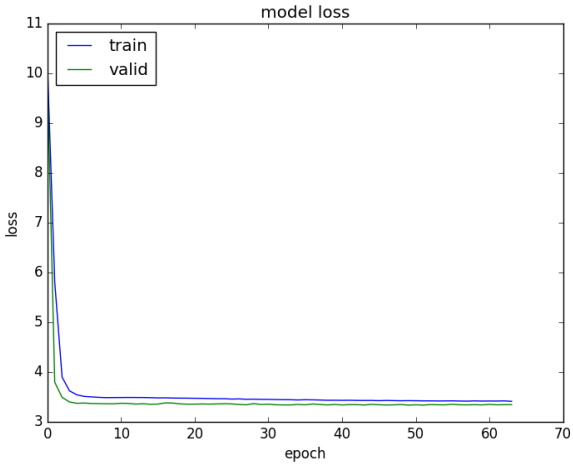


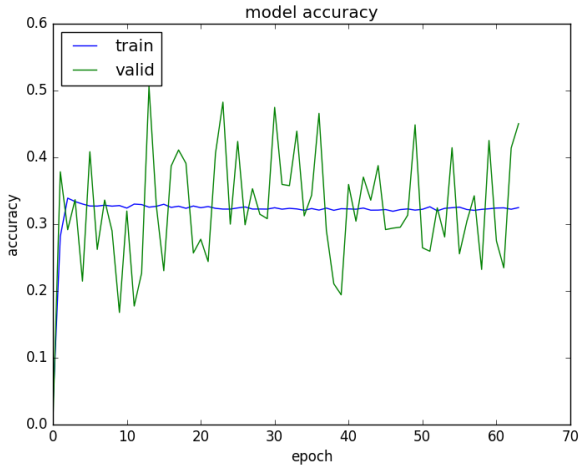


on test data : loss: 1.23 & acc: 0.52

3. Captcha with three numbers (Acuraccy: ~52% on train and validation set)

70000 test and validation set, 5000 test set





on test data : loss: 1.54 & acc: 0.4886.

Screen shots: