

E0256 Deep Learning

Report on Implementation of FizzBuzz using Machine Learning

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Software 1

This file is produced using the classical FizzBuzz code. It utilizes mod operator to output 'fizzbuzz', 'fizz', 'buzz', or input number itself, depending on whether the input is divisible by 15, 3, 5 or none of these.

Software 2

This file is produced by a neural network that's designed to essentially perform divisibility test.

Model:

I decided to first encode the input numbers in binary format. My motivation for this decision was the fact that finite automata can compute divisibility by 3 test, so a neural net can also learn similar affine transformation. The first layer consists of 10 nodes followed by 2000 nodes. The activation function after this layer is Rectified Linear Unit. The loss function used is Mean Squared Error function. The output layer contains has four nodes. I encoded the true values using One Hot Encoder for both training set and test set. The idea behind this decision was that for a small network like this, divisibility by a factor acts more like categorical feature rather than numerical feature.

Hyperparameters:

I performed various iterations to decide on hyperparameters of the model. Below, I have attached a graph of hyperparameters vs accuracy of model. The accuracy peaks around 2000 neurons for the hidden layer after which models seems to be overfitting and accuracy begins to deteriorate. Also the loss begins to get at acceptable levels when epochs reach around 2000.

