

1. Project
  - a. Count 1s of binary strings with length 20
2. Date
  - a. June 24, 2017
3. Engineer
  - a. Gonsoo Moon
4. Environment
  - a. Mac Pro 2.6 GHz Intel Core i5, 16 GB RAM
  - b. Python 2.7.11
  - c. Tensorflow 1.0.0
5. How to run
  - a. On the command line, type Python2 count1sBinaryString.py
6. Result
  - a. With epoch 5, error rate is 83.7 (Training example: 10,000, Test example: 1,038,576

```
@> python2 count1sBinaryString.py
Input size of total data is: 1048576
Output size of total data is: 1048576

train_input: 10000
test_input: 1038576
train_output: 10000
test_output: 1038576
/Library/Frameworks/Python.framework/Versions/2.7/lib/python2.7/site-packages/tensorflow/python/ops/gradients_impl.py:91: UserWarning: Converting sparse IndexedSlices to a dense Tensor of unknown shape. This may consume a large amount of memory.
  "Converting sparse IndexedSlices to a dense Tensor of unknown shape. "
no_of_batches: 10
Epoch - 0
Epoch - 1
Epoch - 2
Epoch - 3
Epoch - 4
Epoch 5 error 83.7
Start time: Sat Jun 24 21:30:26 2017
End time: Sat Jun 24 21:31:37 2017
Total execution time: 1.17322920163
```

- b. With epoch 5000, error rate is 0.1 (Training example: 10,000, Test example: 1,038,576

```
Epoch - 4995
Epoch - 4996
Epoch - 4997
Epoch - 4998
Epoch - 4999
Epoch 5000 error 0.1
Start time: Wed Jun 21 22:49:52 2017
End time: Wed Jun 21 23:38:25 2017
Total execution time: 48.5408821503
```

7. Reference
  - a. MONIK's blog (2016), A noob's guide to implementing RNN-LSTM using Tensorflow, <http://monik.in/a-noobs-guide-to-implementing-rnn-lstm-using-tensorflow/>