Bondai_Model_1

April 3, 2019

```
In [3]: """
        No need to execute this block when working on local system.
        """

        # Mount Google Drive
        from google.colab import drive
        drive.mount("/content/vdrive", force_remount = True)
```

```
Go to this URL in a browser: https://accounts.google.com/o/oauth2/auth?client_id=947318989803-6

Enter your authorization code:
ûûûûûûûûû
Mounted at /content/vdrive
```

```
In [0]: # Files to process
        """
        Modify the locations below as per your directory struture.
        """
        root_dir = "/content/vdrive/My Drive/Colab Notebooks/Projects/Bondai/SP 500/data/"
        data_dir = "/content/vdrive/My Drive/Colab Notebooks/Projects/Bondai/SP 500/data/raw/"
        prep_dir = "/content/vdrive/My Drive/Colab Notebooks/Projects/Bondai/SP 500/data/prep/"
```

```
In [0]: # Loading the csv tickers, train_tickers and test_tickers file
        import pandas as pd
        ticker_list_df = pd.read_csv(root_dir + "ticker_list.csv", header = None, names = ["Tic
        train_tickers_df = pd.read_csv(root_dir + "train_tickers.csv", header = None, names =
        test_tickers_df = pd.read_csv(root_dir + "test_tickers.csv", header = None, names = ["T
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In [0]: train_set = set(train_tickers_df["Train Tickers"].tolist())
        test_set = set(test_tickers_df["Test Tickers"].tolist())
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In [0]: def in_out_split(data, n_steps):
            for i in range(1, len(data)):
                end_ix = i + n_steps
                if(end_ix > len(data) - 1):
                    break
```

```python
            seq_x, seq_y = data[i:end_ix, :], data[end_ix, :]

            if ticker in train_set:
                X_train.append(seq_x)
                y_train.append(seq_y)
            else:
                X_test.append(seq_x)
                y_test.append(seq_y)

In [0]: def read_data_from_file(ticker):
            df = pd.read_csv(prep_dir + ticker + ".csv")
            return df[["net_income", "op_income", "gross_profit", "crr_asst", "ncrr_asst", "cr

In [9]: X_train, y_train = list(), list()
        X_test, y_test = list(), list()

        n_steps = 2

        counter = 0
        for ticker in ticker_list_df["Tickers"]:
            counter += 1
            print("Fetching data for: " + ticker + "(" + str(counter) + "/"+ str(len(ticker_lis
            data = read_data_from_file(ticker)
            in_out_split(data, n_steps)
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In [10]: print(len(X_train), len(y_train))
         print(len(X_test), len(y_test))
```

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2283 2283
477 477
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```
In [0]: import numpy as np
        X_train, X_test, y_train, y_test = np.array(X_train), np.array(X_test), np.array(y_tra
```

```
In [12]: n_features = X_train.shape[2]
         n_features
```

```
Out[12]: 7
```

```
In [13]: from keras.models import Sequential
         from keras.layers import LSTM
         from keras.layers import Dense
```

```
Using TensorFlow backend.
```

```
In [14]: model = Sequential()
         model.add(LSTM(100, activation = "relu", return_sequences = True, input_shape = (n_ste
         model.add(LSTM(100, activation = "relu"))
         model.add(Dense(n_features))

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/tensorflow/python/framework/op_c
Instructions for updating:
Colocations handled automatically by placer.


In [0]: model.compile(optimizer = "adam", loss = "mse")

In [17]: model.fit(X_train, y_train, epochs = 400, batch_size = 1, shuffle = True, verbose = 1)

Epoch 1/400
2283/2283 [==============================] - 47s 21ms/step - loss: 21396.9507
Epoch 2/400
2283/2283 [==============================] - 47s 21ms/step - loss: 22457.5141
Epoch 3/400
2283/2283 [==============================] - 47s 20ms/step - loss: 27892.8597
Epoch 4/400
2283/2283 [==============================] - 46s 20ms/step - loss: 20705.1568
Epoch 5/400
2283/2283 [==============================] - 46s 20ms/step - loss: 38658.9330
Epoch 6/400
2283/2283 [==============================] - 47s 20ms/step - loss: 18622.4718
Epoch 7/400
2283/2283 [==============================] - 46s 20ms/step - loss: 22524.4771
Epoch 8/400
2283/2283 [==============================] - 46s 20ms/step - loss: 35030.4136
Epoch 9/400
2283/2283 [==============================] - 45s 20ms/step - loss: 30299.3476
Epoch 10/400
2283/2283 [==============================] - 46s 20ms/step - loss: 18746.2904
Epoch 11/400
2283/2283 [==============================] - 46s 20ms/step - loss: 28450.2886
Epoch 12/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14989.2568
Epoch 13/400
2283/2283 [==============================] - 46s 20ms/step - loss: 25404.0286
Epoch 14/400
2283/2283 [==============================] - 45s 20ms/step - loss: 18377.2422
Epoch 15/400
2283/2283 [==============================] - 45s 20ms/step - loss: 25106.6315
Epoch 16/400
2283/2283 [==============================] - 47s 20ms/step - loss: 28569.1173
Epoch 17/400
2283/2283 [==============================] - 47s 20ms/step - loss: 25519.7960
Epoch 18/400
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2283/2283 [==============================] - 46s 20ms/step - loss: 18016.3276
Epoch 19/400
2283/2283 [==============================] - 46s 20ms/step - loss: 33727.1740
Epoch 20/400
2283/2283 [==============================] - 46s 20ms/step - loss: 26599.9068
Epoch 21/400
2283/2283 [==============================] - 46s 20ms/step - loss: 22513.9246
Epoch 22/400
2283/2283 [==============================] - 46s 20ms/step - loss: 17307.4406
Epoch 23/400
2283/2283 [==============================] - 46s 20ms/step - loss: 17161.4188
Epoch 24/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14576.4054
Epoch 25/400
2283/2283 [==============================] - 46s 20ms/step - loss: 33329.0867
Epoch 26/400
2283/2283 [==============================] - 46s 20ms/step - loss: 26917.5480
Epoch 27/400
2283/2283 [==============================] - 46s 20ms/step - loss: 20594.7759
Epoch 28/400
2283/2283 [==============================] - 47s 20ms/step - loss: 49383.2046
Epoch 29/400
2283/2283 [==============================] - 46s 20ms/step - loss: 23472.5831
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2283/2283 [==============================] - 46s 20ms/step - loss: 24821.9255
Epoch 31/400
2283/2283 [==============================] - 47s 20ms/step - loss: 26474.6894
Epoch 32/400
2283/2283 [==============================] - 46s 20ms/step - loss: 24732.8351
Epoch 33/400
2283/2283 [==============================] - 46s 20ms/step - loss: 16793.6930
Epoch 34/400
2283/2283 [==============================] - 46s 20ms/step - loss: 24769.3509
Epoch 35/400
2283/2283 [==============================] - 46s 20ms/step - loss: 24259.2616
Epoch 36/400
2283/2283 [==============================] - 46s 20ms/step - loss: 23164.4641
Epoch 37/400
2283/2283 [==============================] - 46s 20ms/step - loss: 45054.2660
Epoch 38/400
2283/2283 [==============================] - 46s 20ms/step - loss: 25713.4231
Epoch 39/400
2283/2283 [==============================] - 46s 20ms/step - loss: 20578.2416
Epoch 40/400
2283/2283 [==============================] - 45s 20ms/step - loss: 27508.6605
Epoch 41/400
2283/2283 [==============================] - 45s 20ms/step - loss: 40514.6216
Epoch 42/400
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2283/2283 [==============================] - 46s 20ms/step - loss: 47344.4608
Epoch 43/400
2283/2283 [==============================] - 46s 20ms/step - loss: 38052.0140
Epoch 44/400
2283/2283 [==============================] - 46s 20ms/step - loss: 23204.7790
Epoch 45/400
2283/2283 [==============================] - 46s 20ms/step - loss: 23511.3032
Epoch 46/400
2283/2283 [==============================] - 46s 20ms/step - loss: 15260.5666
Epoch 47/400
2283/2283 [==============================] - 46s 20ms/step - loss: 17119.4203
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Epoch 51/400
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Epoch 53/400
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Epoch 55/400
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Epoch 56/400
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Epoch 57/400
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Epoch 58/400
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Epoch 59/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14694.0935
Epoch 60/400
2283/2283 [==============================] - 46s 20ms/step - loss: 15310.8171
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2283/2283 [==============================] - 46s 20ms/step - loss: 19001.4497
Epoch 62/400
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Epoch 63/400
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Epoch 64/400
2283/2283 [==============================] - 45s 20ms/step - loss: 21588.5636
Epoch 65/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14210.4442
Epoch 66/400
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2283/2283 [==============================] - 45s 20ms/step - loss: 22958.9374
Epoch 67/400
2283/2283 [==============================] - 45s 20ms/step - loss: 19731.0250
Epoch 68/400
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Epoch 69/400
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Epoch 70/400
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Epoch 90/400
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Epoch 113/400
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Epoch 114/400
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2283/2283 [==============================] - 46s 20ms/step - loss: 23759.5149
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Epoch 138/400
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2283/2283 [==============================] - 45s 20ms/step - loss: 17516.2927
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Epoch 162/400
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2283/2283 [==============================] - 45s 20ms/step - loss: 23779.3802
Epoch 163/400
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Epoch 186/400
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2283/2283 [==============================] - 46s 20ms/step - loss: 16552.8620
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Epoch 210/400
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2283/2283 [==============================] - 46s 20ms/step - loss: 15156.7974
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Epoch 217/400
2283/2283 [==============================] - 47s 21ms/step - loss: 26067.0749
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2283/2283 [==============================] - 47s 21ms/step - loss: 14652.2267
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Epoch 234/400
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2283/2283 [==============================] - 47s 21ms/step - loss: 16454.3198
Epoch 235/400
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Epoch 238/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12406.6956
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Epoch 243/400
2283/2283 [==============================] - 47s 20ms/step - loss: 12041.1361
Epoch 244/400
2283/2283 [==============================] - 46s 20ms/step - loss: 10258.5745
Epoch 245/400
2283/2283 [==============================] - 47s 20ms/step - loss: 9836.9047
Epoch 246/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12814.7517
Epoch 247/400
2283/2283 [==============================] - 46s 20ms/step - loss: 24523.7396
Epoch 248/400
2283/2283 [==============================] - 46s 20ms/step - loss: 15213.5441
Epoch 249/400
2283/2283 [==============================] - 45s 20ms/step - loss: 28896.3005
Epoch 250/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13780.3588
Epoch 251/400
2283/2283 [==============================] - 46s 20ms/step - loss: 9004.5366
Epoch 252/400
2283/2283 [==============================] - 46s 20ms/step - loss: 9920.1280
Epoch 253/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12148.9440
Epoch 254/400
2283/2283 [==============================] - 46s 20ms/step - loss: 16582.3390
Epoch 255/400
2283/2283 [==============================] - 45s 20ms/step - loss: 12706.9605
Epoch 256/400
2283/2283 [==============================] - 45s 20ms/step - loss: 9733.9838
Epoch 257/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12681.5652
Epoch 258/400
```

```
2283/2283 [==============================] - 46s 20ms/step - loss: 13922.0986
Epoch 259/400
2283/2283 [==============================] - 46s 20ms/step - loss: 11451.5725
Epoch 260/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13969.2172
Epoch 261/400
2283/2283 [==============================] - 45s 20ms/step - loss: 15976.9884
Epoch 262/400
2283/2283 [==============================] - 45s 20ms/step - loss: 17548.3804
Epoch 263/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14113.0261
Epoch 264/400
2283/2283 [==============================] - 46s 20ms/step - loss: 8879.0594
Epoch 265/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13989.0456
Epoch 266/400
2283/2283 [==============================] - 45s 20ms/step - loss: 15387.2820
Epoch 267/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14779.1291
Epoch 268/400
2283/2283 [==============================] - 46s 20ms/step - loss: 207116.0642
Epoch 269/400
2283/2283 [==============================] - 45s 20ms/step - loss: 17659.1405
Epoch 270/400
2283/2283 [==============================] - 46s 20ms/step - loss: 15554.4775
Epoch 271/400
2283/2283 [==============================] - 45s 20ms/step - loss: 55935.2171
Epoch 272/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14217.1582
Epoch 273/400
2283/2283 [==============================] - 46s 20ms/step - loss: 8769.3332
Epoch 274/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13057.0696
Epoch 275/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12548.3509
Epoch 276/400
2283/2283 [==============================] - 45s 20ms/step - loss: 11642.1611
Epoch 277/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12968.3957
Epoch 278/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12900.1807
Epoch 279/400
2283/2283 [==============================] - 45s 20ms/step - loss: 15505.2557
Epoch 280/400
2283/2283 [==============================] - 45s 20ms/step - loss: 12591.9407
Epoch 281/400
2283/2283 [==============================] - 45s 20ms/step - loss: 12843.2563
Epoch 282/400
```

```
2283/2283 [==============================] - 46s 20ms/step - loss: 13373.4200
Epoch 283/400
2283/2283 [==============================] - 45s 20ms/step - loss: 18258.2234
Epoch 284/400
2283/2283 [==============================] - 45s 20ms/step - loss: 11536.3783
Epoch 285/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14251.4744
Epoch 286/400
2283/2283 [==============================] - 45s 20ms/step - loss: 15500.9827
Epoch 287/400
2283/2283 [==============================] - 45s 20ms/step - loss: 12985.4851
Epoch 288/400
2283/2283 [==============================] - 46s 20ms/step - loss: 15486.1016
Epoch 289/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13217.0624
Epoch 290/400
2283/2283 [==============================] - 45s 20ms/step - loss: 18545.4760
Epoch 291/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13578.2908
Epoch 292/400
2283/2283 [==============================] - 46s 20ms/step - loss: 19862.1559
Epoch 293/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14594.4116
Epoch 294/400
2283/2283 [==============================] - 46s 20ms/step - loss: 17461.0174
Epoch 295/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14619.1534
Epoch 296/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14239.9525
Epoch 297/400
2283/2283 [==============================] - 45s 20ms/step - loss: 12783.0571
Epoch 298/400
2283/2283 [==============================] - 46s 20ms/step - loss: 17149.2066
Epoch 299/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14202.1633
Epoch 300/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14491.3252
Epoch 301/400
2283/2283 [==============================] - 46s 20ms/step - loss: 16163.2148
Epoch 302/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13537.6751
Epoch 303/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14491.8553
Epoch 304/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14825.6331
Epoch 305/400
2283/2283 [==============================] - 46s 20ms/step - loss: 16648.2577
Epoch 306/400
```

```
2283/2283 [==============================] - 45s 20ms/step - loss: 13498.5744
Epoch 307/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12422.1072
Epoch 308/400
2283/2283 [==============================] - 46s 20ms/step - loss: 16145.0294
Epoch 309/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14168.2717
Epoch 310/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13174.0889
Epoch 311/400
2283/2283 [==============================] - 46s 20ms/step - loss: 15929.5049
Epoch 312/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14557.8253
Epoch 313/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13883.0629
Epoch 314/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13511.1314
Epoch 315/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13601.5270
Epoch 316/400
2283/2283 [==============================] - 46s 20ms/step - loss: 15464.3753
Epoch 317/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14088.2168
Epoch 318/400
2283/2283 [==============================] - 46s 20ms/step - loss: 17366.7588
Epoch 319/400
2283/2283 [==============================] - 46s 20ms/step - loss: 18725.8649
Epoch 320/400
2283/2283 [==============================] - 46s 20ms/step - loss: 20369.1249
Epoch 321/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14466.9783
Epoch 322/400
2283/2283 [==============================] - 46s 20ms/step - loss: 15807.5288
Epoch 323/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14868.5300
Epoch 324/400
2283/2283 [==============================] - 45s 20ms/step - loss: 15200.3505
Epoch 325/400
2283/2283 [==============================] - 45s 20ms/step - loss: 16185.3951
Epoch 326/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14604.8007
Epoch 327/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13985.9577
Epoch 328/400
2283/2283 [==============================] - 46s 20ms/step - loss: 16898.0481
Epoch 329/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14872.5820
Epoch 330/400
```

```
2283/2283 [==============================] - 46s 20ms/step - loss: 12372.0175
Epoch 331/400
2283/2283 [==============================] - 45s 20ms/step - loss: 16273.4202
Epoch 332/400
2283/2283 [==============================] - 46s 20ms/step - loss: 17293.8771
Epoch 333/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12709.3715
Epoch 334/400
2283/2283 [==============================] - 46s 20ms/step - loss: 20261.0881
Epoch 335/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13178.4416
Epoch 336/400
2283/2283 [==============================] - 46s 20ms/step - loss: 15277.5913
Epoch 337/400
2283/2283 [==============================] - 45s 20ms/step - loss: 15480.8986
Epoch 338/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13332.0970
Epoch 339/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14223.1566
Epoch 340/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13586.6139
Epoch 341/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14366.4408
Epoch 342/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14257.4966
Epoch 343/400
2283/2283 [==============================] - 46s 20ms/step - loss: 11969.2583
Epoch 344/400
2283/2283 [==============================] - 45s 20ms/step - loss: 16714.7150
Epoch 345/400
2283/2283 [==============================] - 46s 20ms/step - loss: 16154.9249
Epoch 346/400
2283/2283 [==============================] - 46s 20ms/step - loss: 11972.2164
Epoch 347/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12091.3548
Epoch 348/400
2283/2283 [==============================] - 46s 20ms/step - loss: 18587.8955
Epoch 349/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12174.0266
Epoch 350/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13917.7476
Epoch 351/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14951.0894
Epoch 352/400
2283/2283 [==============================] - 46s 20ms/step - loss: 14224.1234
Epoch 353/400
2283/2283 [==============================] - 46s 20ms/step - loss: 13175.3607
Epoch 354/400
```

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2283/2283 [==============================] - 45s 20ms/step - loss: 16584.8198
Epoch 355/400
2283/2283 [==============================] - 45s 20ms/step - loss: 12260.1049
Epoch 356/400
2283/2283 [==============================] - 46s 20ms/step - loss: 12776.5599
Epoch 357/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13912.4703
Epoch 358/400
2283/2283 [==============================] - 44s 19ms/step - loss: 18457.2637
Epoch 359/400
2283/2283 [==============================] - 45s 20ms/step - loss: 16886.2911
Epoch 360/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14180.4359
Epoch 361/400
2283/2283 [==============================] - 45s 20ms/step - loss: 12325.3125
Epoch 362/400
2283/2283 [==============================] - 45s 20ms/step - loss: 12786.7903
Epoch 363/400
2283/2283 [==============================] - 45s 20ms/step - loss: 23074.3917
Epoch 364/400
2283/2283 [==============================] - 45s 20ms/step - loss: 19694.1106
Epoch 365/400
2283/2283 [==============================] - 44s 19ms/step - loss: 19050.0905
Epoch 366/400
2283/2283 [==============================] - 45s 20ms/step - loss: 16660.6614
Epoch 367/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13071.5326
Epoch 368/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13284.9935
Epoch 369/400
2283/2283 [==============================] - 45s 20ms/step - loss: 16088.3474
Epoch 370/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14928.6673
Epoch 371/400
2283/2283 [==============================] - 44s 19ms/step - loss: 12631.3613
Epoch 372/400
2283/2283 [==============================] - 44s 19ms/step - loss: 31549.1301
Epoch 373/400
2283/2283 [==============================] - 44s 19ms/step - loss: 30636.4600
Epoch 374/400
2283/2283 [==============================] - 44s 19ms/step - loss: 21440.2214
Epoch 375/400
2283/2283 [==============================] - 45s 20ms/step - loss: 21492.9436
Epoch 376/400
2283/2283 [==============================] - 44s 19ms/step - loss: 19327.7710
Epoch 377/400
2283/2283 [==============================] - 44s 19ms/step - loss: 18013.9162
Epoch 378/400
```

```
2283/2283 [==============================] - 44s 19ms/step - loss: 14752.9454
Epoch 379/400
2283/2283 [==============================] - 44s 19ms/step - loss: 12722.0423
Epoch 380/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14331.8260
Epoch 381/400
2283/2283 [==============================] - 44s 19ms/step - loss: 14365.2662
Epoch 382/400
2283/2283 [==============================] - 44s 19ms/step - loss: 14246.0471
Epoch 383/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14715.9506
Epoch 384/400
2283/2283 [==============================] - 45s 20ms/step - loss: 15993.9436
Epoch 385/400
2283/2283 [==============================] - 44s 19ms/step - loss: 13662.2606
Epoch 386/400
2283/2283 [==============================] - 44s 19ms/step - loss: 13738.5903
Epoch 387/400
2283/2283 [==============================] - 45s 20ms/step - loss: 14218.6998
Epoch 388/400
2283/2283 [==============================] - 45s 19ms/step - loss: 13719.2720
Epoch 389/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13801.9665
Epoch 390/400
2283/2283 [==============================] - 44s 19ms/step - loss: 17415.9082
Epoch 391/400
2283/2283 [==============================] - 45s 20ms/step - loss: 15213.5768
Epoch 392/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13319.1826
Epoch 393/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13507.4256
Epoch 394/400
2283/2283 [==============================] - 45s 19ms/step - loss: 15518.3146
Epoch 395/400
2283/2283 [==============================] - 45s 20ms/step - loss: 22373.5621
Epoch 396/400
2283/2283 [==============================] - 45s 20ms/step - loss: 17441.6733
Epoch 397/400
2283/2283 [==============================] - 45s 20ms/step - loss: 20489.6983
Epoch 398/400
2283/2283 [==============================] - 45s 20ms/step - loss: 19127.6186
Epoch 399/400
2283/2283 [==============================] - 45s 20ms/step - loss: 16705.1077
Epoch 400/400
2283/2283 [==============================] - 45s 20ms/step - loss: 13468.4441
```

Out[17]: <keras.callbacks.History at 0x7f916a2ba780>

```
In [18]: model.evaluate(X_test, y_test, verbose=1)

477/477 [==============================] - 0s 569us/step


Out[18]: 101483.86884990828

In [19]: X_test[1]

Out[19]: array([[ 5.55266944,  6.32346702,  3.699585  , 19.00406951,  6.56433931,
                 15.81178635, 28.03560508],
                [11.20347561,  9.3855671 ,  5.92224248,  4.8176715 ,  6.09787726,
                  5.29323851, -2.69250564]])

In [22]: test_input = X_test[1].reshape(1, n_steps, n_features)
         model.predict(test_input, verbose = 1)

1/1 [==============================] - 0s 13ms/step


Out[22]: array([[21.100327 , 11.570558 ,  6.8380294,  5.419005 , 10.860134 ,
                 8.665996 , 15.548083 ]], dtype=float32)

In [21]: y_test[1]

Out[21]: array([ 7.99969413,  5.62554833,  9.61218578,  2.76932195, 15.6155745 ,
               14.79676758, 24.00850802])

In [0]: model.save(root_dir + "bondai_model_1.0.h5")
```