Week 4 meeting notes

1. Technical Indicator

- MACD (Moving Average Convergence Divergence): It is constructed by subtracting the Long Term Moving Average of the stock from Short Term moving average.

- Features:
  MA7, MA21, MACD, 20SD, upper_band, lower_band, EMA, logmomentum

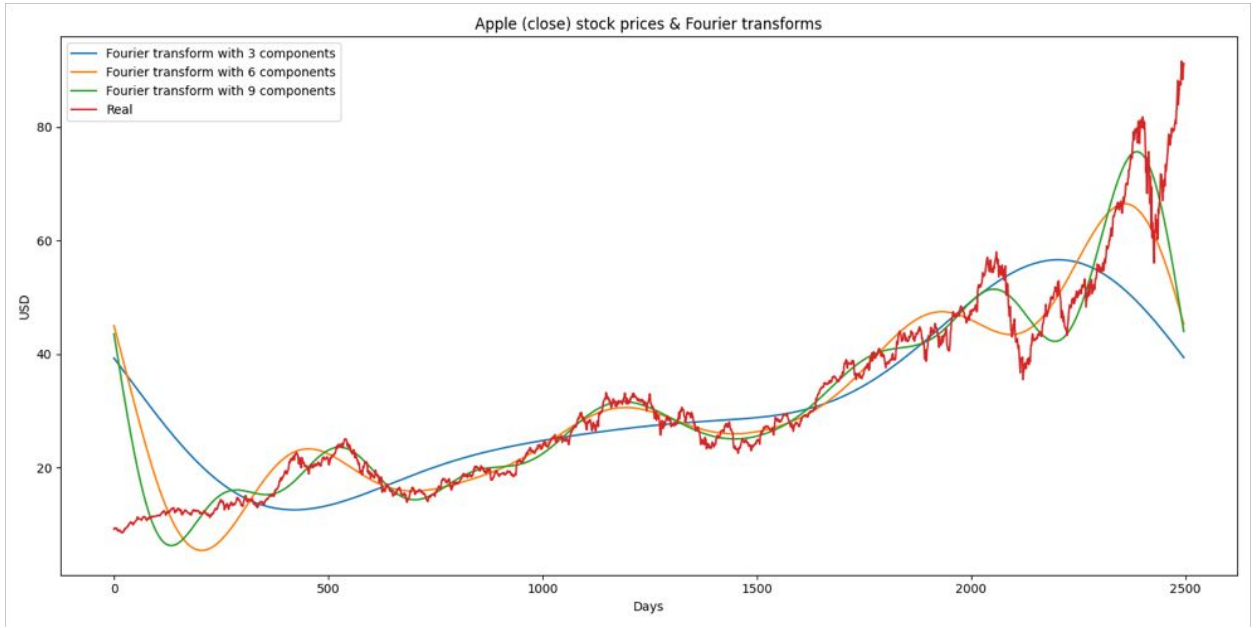
- Will drop the first 21 days data.

MA7	MA21	MACD	20SD	upper_band	lower_band	EMA	logmomentum
		[illegible]				[illegible]	[illegible]
		-0.2154812115384620				8.833035250000000	2.056593118151980
		-0.18838493384388000				8.865301461538460	2.064282471365670
		-0.06664999810664090				9.117017425000000	2.108783572855420
		-0.0607472098938846				9.184282619834710	2.1062660265562400
		-0.02482831035271180				9.242935997252750	2.1128934839630300
9.069999714285710		-0.02503642685840820				9.206914861848130	2.1027831200831700
9.086938428571430		-0.04675237484041790				9.064187866768300	2.07854826782952
9.116479428571430		-0.0208648504099731				9.038775997866070	2.0826952426492400
9.130867285714290		0.0014540732724004400				8.999829339723620	2.07698314730316
9.086122428571430		-0.013595373951007500				8.949942831630410	2.0700223197633400
9.022296000000000		-0.026781204343379300				8.830457385710520	2.0503621807379400
8.982857428571430		0.027139109831889400				8.94086719782202	2.0789504210998600
8.96729614285714		-0.03973327917259260				9.03362241866682	2.089391872533000
9.004132857142860		-0.037062551855838100				9.17835014964193	2.1102997420562900
9.040918428571430		-0.027707747785598300				9.248497384843540	2.1142741556158300
9.080867428571430		-0.03759449330374310				9.256165795007230	2.1114245875328900
9.153214428571430		-0.033243220226003300				9.373007931970660	2.1319662712897100
9.231683714285710		-0.054549338344452600				9.337669310626480	2.1186622548331200
9.263418285714280		-0.06518359999256870	0.18980204783030300			9.258032436852650	2.1063529105213000
9.278775428571430	9.105357095238090	-0.05022519097677150	0.18288518340701800	9.471127462052130	8.739586728424060	9.211010812279720	2.1026086009613700
9.293214285714290	9.128095190476190	-0.04748353189969910 0	0.17590373453385900	9.479902659543910	8.776287721408470	9.304860937429570	2.1224754082066500
9.303367428571430	9.153588428571430	-0.047158293940562100	0.17037813399824600	9.494344696567920	8.812832160574940	9.33804897914354	2.122817432229600
9.322245000000000	9.177993238095240	-0.05279270100900750	0.1770950862237290	9.532183410542700	8.823803065647780	9.37411165971464	2.127295910986950
9.310102142857140	9.183146333333330	-0.05445277109814660	0.18102716127822000	9.54520065588977	8.821092010776890	9.35565655323819	2.1218337827174900
9.30566342857143	9.186547714285710	-0.049376078496989000	0.18150817764700700	9.549564069579730	8.823531358991700	9.311171517746050	2.1149207690038800

2. Fourier Transform

- To generalize several long- and short-term trends.
- Using these transforms we will eliminate a lot of noise (random walks) and create approximations of the real stock movement.
- Having trend approximations can help the LSTM network pick its prediction trends more accurately.
- 3, 6 and 9 components

absolute of 3 comp	angle of 3 comp	absolute of 6 comp	angle of 6 comp	absolute of 9 comp	angle of 9 comp
39.29506496517760	-0.05809923513918570	44.78361321431910	-0.04751562868426270	43.11460480662600	-0.02502525111579350
39.19506807061120	-0.05821728029807250	44.50528889092010	-0.04803637408467220	42.64409519435040	-0.02520460657596860
39.094980604234200	-0.05833273563550870	44.226154656325500	-0.04855354982259880	42.17355069630410	-0.02537491264468990
38.99480491127750	-0.05844558036656350	43.94623713452310	-0.0490670373075501	41.70306621355240	-0.02553586271982320
38.894543339187900	-0.05855793617434100	43.66556305320790	-0.04957671568403900	41.23273642068580	-0.02568714173663150
38.794198237555800	-0.05866335442540880	43.38415924011920	-0.05008246176934360	40.762655737130600	-0.02582842589840200
38.693771958042700	-0.05876824173883800	43.10205261936530	-0.05058414998957070	40.292918298602600	-0.02595938239979110



3. News (Sentiment analysis)

- Selenium
- website: Seeking Alpha

Date	Article Title
2020/6/30	Apple Arcade cancels games in strategy shift - Bloomberg
2020/6/30	Shipment estimates cut for Apple's 5G iPhones - Digitimes
2020/6/29	NYT pulls out of Apple News partnership
2020/6/29	Apple leaving adapters out of iPhone 12 box - analyst
2020/6/27	Apple seen benefiting from chips play
2020/6/26	DOJ's Apple probe focusing on App Store payment rules - Bloomberg
2020/6/25	Apple re-closing 14 stores in Florida
2020/6/25	Apple closes more stores amid spike in COVID-19 cases
2020/6/24	UBS reviews names to watch in 'consumerization of healthcare'

- Finbert pretrained model (particular for finance data)
- Sentiment analysis, giving score to the news. (positive, neutral, negative)

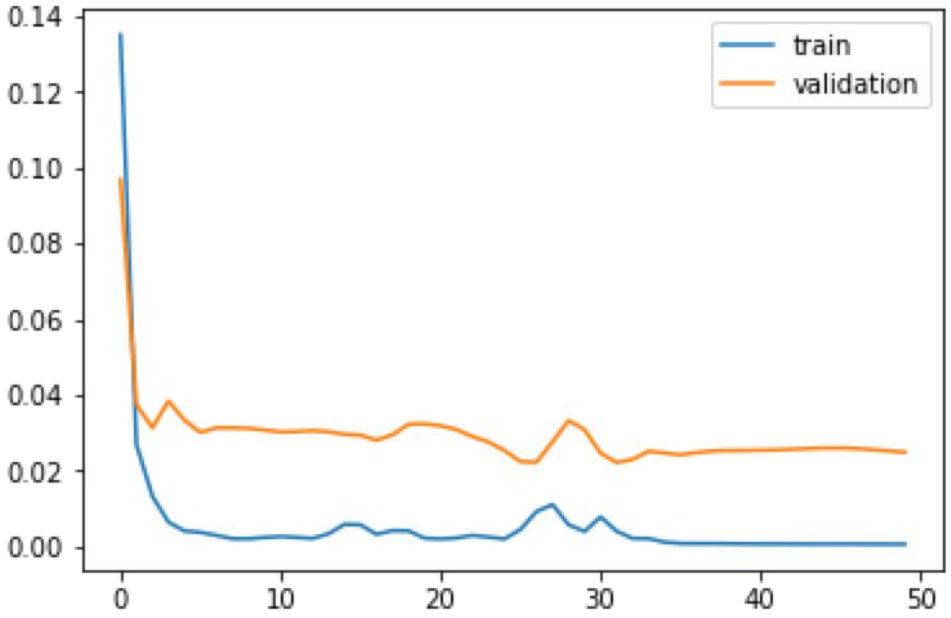
Date	Sentimen Score	Article Title
2020/6/30	-0.918081701	Apple Arcade cancels games in strategy shift - Bloomberg
2020/6/30	-0.888130665	Shipment estimates cut for Apple's 5G iPhones - Digitimes
2020/6/29	-0.885745525	NYT pulls out of Apple News partnership
2020/6/29	-0.825985014	Apple leaving adapters out of iPhone 12 box - analyst
2020/6/27	0.847903252	Apple seen benefiting from chips play
2020/6/26	-0.084378615	DOJ's Apple probe focusing on App Store payment rules - Bloomberg
2020/6/25	-0.912210941	Apple re-closing 14 stores in Florida
2020/6/25	-0.709997535	Apple closes more stores amid spike in COVID-19 cases
2020/6/24	0.006058903	UBS reviews names to watch in 'consumerization of healthcare'

Basic LSTM

Parameters:
LR = 0.001
BATCH_SIZE = 64
N_EPOCH = 50
-> The RMSE is: 6.55

Layer (type)	Output Shape	Param #
lstm_15 (LSTM)	(None, 64)	24832
dense_15 (Dense)	(None, 7)	455

Total params: 25,287
Trainable params: 25,287
Non-trainable params: 0



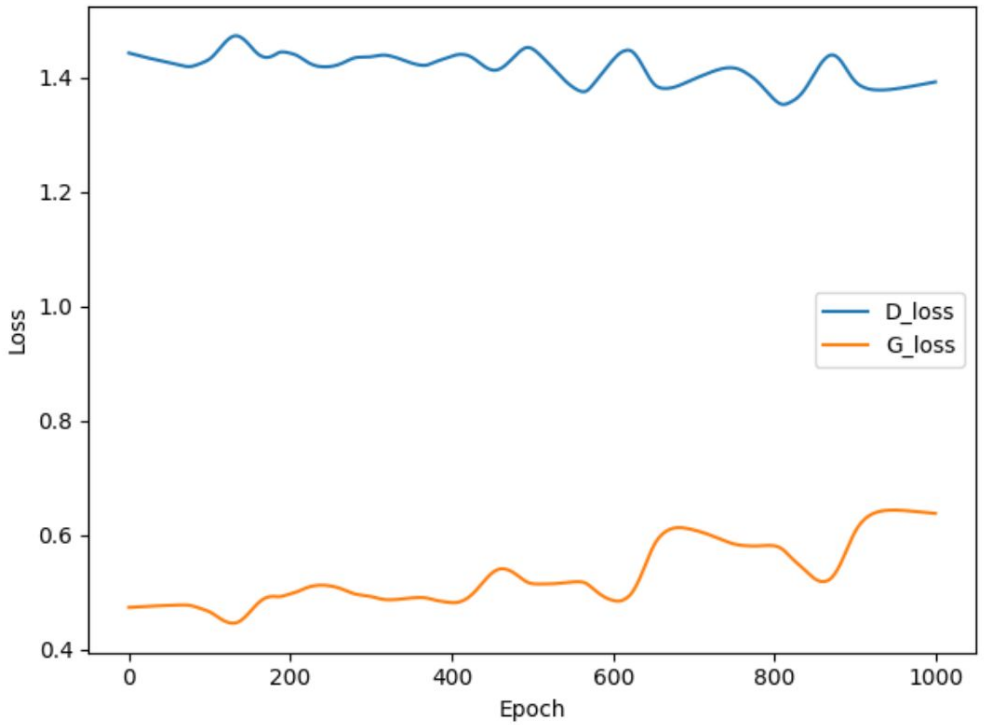
Basic GAN

Generator: LSTM

Layer (type)	Output Shape	Param #
lstm (LSTM)	(None, 64)	25088
dense (Dense)	(None, 7)	455

Discriminator: CNN

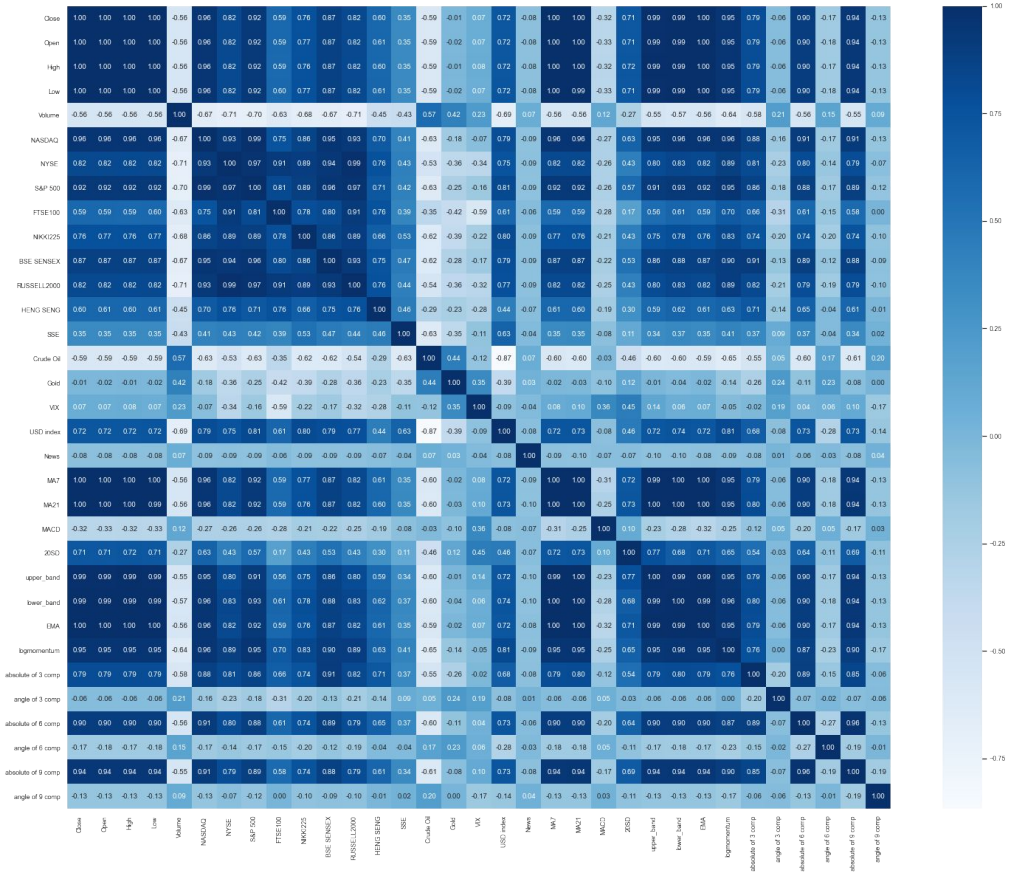
Layer (type)	Output Shape	Param #
conv1d (Conv1D)	(None, 3, 32)	128
conv1d_1 (Conv1D)	(None, 1, 64)	6208
flatten (Flatten)	(None, 64)	0
dense_1 (Dense)	(None, 32)	2048
dense_2 (Dense)	(None, 1)	33



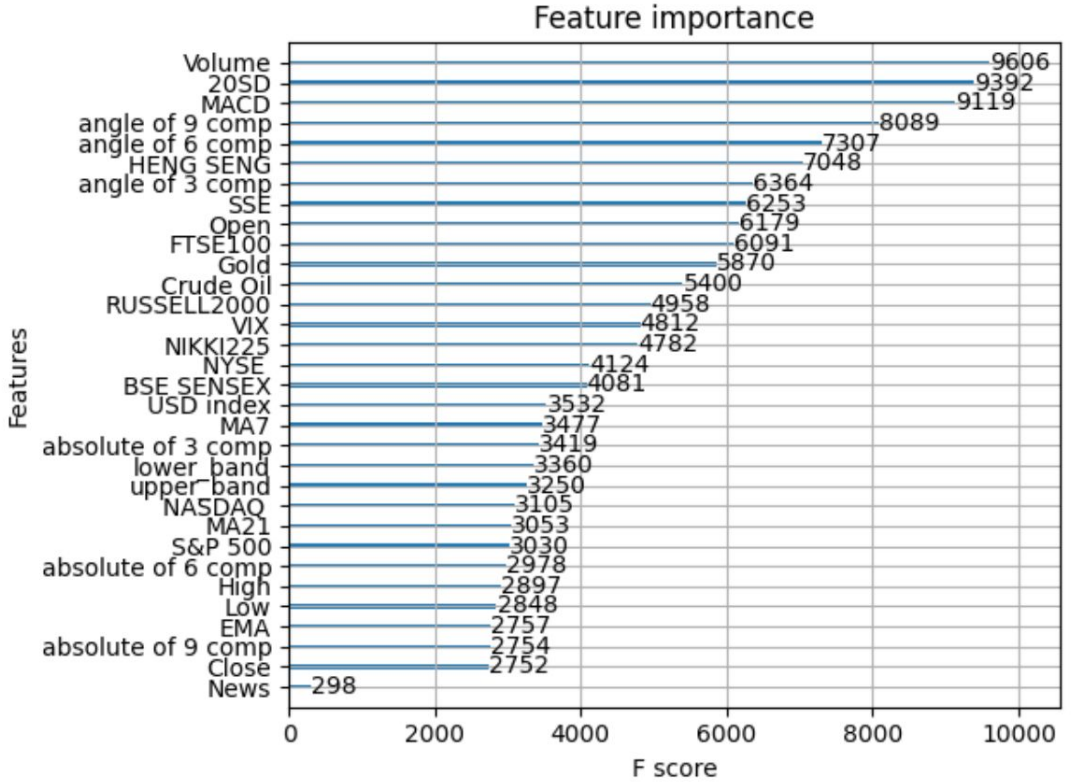
Loss of train for 1000 epoch

Feature Selection

Q: Do we need to drop highly correlation features?



Correlation plot



Result from XGBoost

In progress

- Improving GAN structure
- Working on plot predicted result and the RMSE
- Working on WGAN