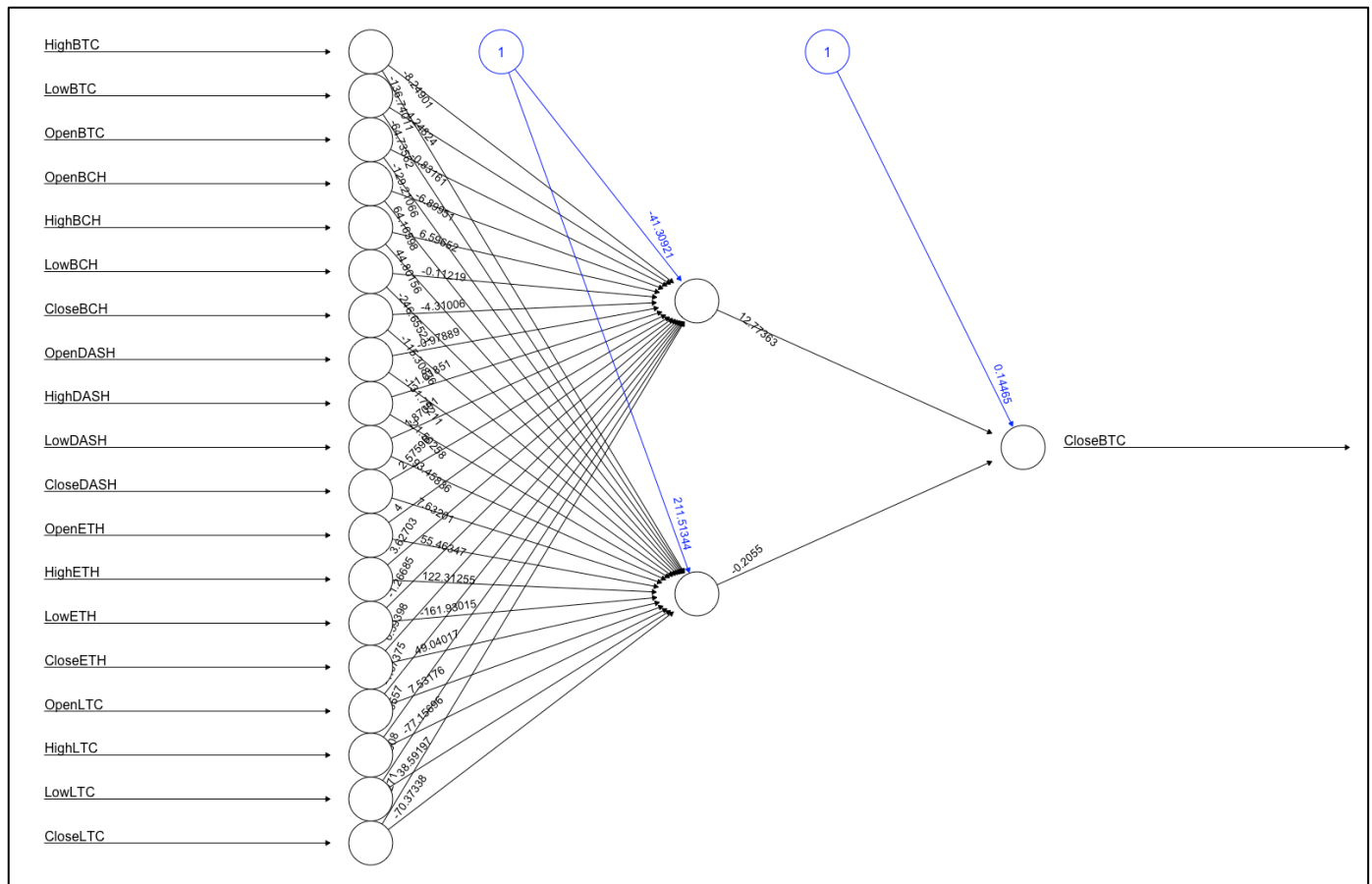


Exercise 13 - High Frequency Neural Network for BTC price prediction (in R)

Feb 14, 2018

High Frequency Neural Network (simple, unoptimized example):



Various HFNN architectures explored:

Hidden Layers	1	1	1	1	1	1	1	1	1
Hidden Neurons	1	2	3	4	5	6	7	8	9
Predictability	0.44	0.54	0.51	NC	NC	NC	NC	NC	NC

Table 1 - High Frequency Neural Network prediction with varying depth (returns z-transform input data predicting binary output)

Sample of cleaned OCLH dataset used:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	Date	OpenBTC	HighBTC	LowBTC	CloseBTC	OpenBCH	HighBCH	LowBCH	CloseBCH	OpenDASH	HighDASH	LowDASH	CloseDASH	OpenETH	HighETH	LowETH	CloseETH	OpenLTC	HighLTC	LowLTC	CloseLTC
2	2018-01-03 14:27-PM	15020.08	15049	15020.08	15048.96	2621	2630	2621	2630	1132.7	1132.7	1130.58	1130.58	874.99	875	873.03	875	249	250	249	249.98
3	2018-01-03 14:28-PM	15048.96	15049	15032.08	15032.08	2630	2635.1	2623	2625	1130.58	1140.58	1130.58	1140.41	875	875	872	872	249.98	250	249.98	249.98
4	2018-01-03 14:29-PM	15032.08	15053.25	15020.08	15040	2625	2625	2623	2623	1140.41	1140.58	1130.48	1136.13	872	876.87	872	872.89	249.98	250	249.98	250
5	2018-01-03 14:30-PM	15040	15054.62	15020.08	15042.19	2623	2623	2623	2623	1136.13	1140.58	1136.13	1136.25	872.89	875	872.1	875	250	250	250	250
6	2018-01-03 14:31-PM	15042.19	15042.19	15000	15000	2623	2635.1	2623	2635.1	1136.25	1136.25	1136.25	1136.25	875	875	872	872	250	250	249.9	249.9
7	2018-01-03 14:32-PM	15000	15000.98	14960.06	14960.06	2635.1	2635.1	2623	2623	1136.25	1136.25	1136.13	1136.13	872	875	872	872	249.9	249.9	248.51	248.51
8	2018-01-03 14:33-PM	14960.06	14999.87	14960.06	14984.01	2623	2623	2620	2621	1136.13	1136.13	1136.13	1136.13	872	875	872	874	248.51	249.8	248.51	249
9	2018-01-03 14:34-PM	14984.01	14998.88	14924.52	14933.83	2621	2621	2621	2621	1136.13	1136.13	1136.13	1136.13	874	874	872	872	249	249	248.51	249
10	2018-01-03 14:35-PM	14933.83	14975	14901.51	14930	2621	2621	2606.1	2606.1	1136.13	1136.13	1124.38	1124.38	872	873.9	870.19	872	249	249	248.1	248.51
11	2018-01-03 14:36-PM	14930	14950	14907.99	14907.99	2606.1	2606.11	2606.1	2606.11	1124.38	1124.38	1124.38	1124.38	872	872	867.94	871.89	248.51	248.51	247.52	247.52
12	2018-01-03 14:37-PM	14907.99	14959.59	14888.14	14888.14	2606.11	2616.11	2606.11	2616	1124.38	1124.38	1124.28	1124.28	871.89	873.9	868.33	868.33	247.52	247.8	247.52	247.52
13	2018-01-03 14:38-PM	14888.14	14927.52	14841	14880	2616	2616	2613.13	2613.13	1124.28	1124.28	1124.28	1124.28	868.33	868.33	868.33	868.33	247.52	248.1	247.52	248.1
14	2018-01-03 14:39-PM	14880	14880	14816.11	14857	2613.13	2614.13	2600	2614.13	1124.28	1124.28	1123.08	1123.08	868.33	870.33	868.33	870	248.1	248.1	247.45	247.45
15	2018-01-03 14:40-PM	14857	14900	14823.68	14900	2614.13	2614.13	2614.13	2614.13	1123.08	1124.28	1123.08	1124.28	870	870	866.25	868	247.45	247.5	247.45	247.5
16	2018-01-03 14:41-PM	14900	14931.87	14875.54	14875.54	2614.13	2614.13	2609.13	2610.69	1124.28	1124.28	1124.28	1124.28	868	873.8	866.25	867	247.5	247.5	247.5	247.5
17	2018-01-03 14:42-PM	14875.54	14907.99	14857	14907.99	2610.69	2610.69	2593	2593	1124.28	1124.28	1122.33	1122.33	867	873.8	867	867	247.5	247.5	247.33	247.45
18	2018-01-03 14:43-PM	14907.99	14947.6	14885.54	14900.11	2593	2607.02	2593	2607.02	1122.33	1122.33	1120	1120	867	873.6	867	873.6	247.45	247.45	246.12	246.12
19	2018-01-03 14:44-PM	14900.11	14962.45	14885.54	14962.45	2607.02	2607.02	2594	2594	1120	1120	1119.65	1119.65	873.6	873.6	870	870	246.12	247.45	246.12	246.4
20	2018-01-03 14:45-PM	14962.45	14965.54	14900.11	14927.36	2594	2600	2594	2600	1119.65	1119.65	1119.65	1119.65	870	872.5	870	872.49	246.4	247.45	246.4	247.45
21	2018-01-03 14:46-PM	14927.36	14992.82	14927.36	14931	2600	2607	2594	2607	1119.65	1124	1119.55	1124	872.49	872.49	870	872.49	247.45	247.45	246.46	246.46
22	2018-01-03 14:47-PM	14931	14984.36	14900	14960.83	2607	2607	2594	2594	1124	1124	1124	1124	872.49	872.49	871	871	246.46	248.1	246.46	248.1
23	2018-01-03 14:48-PM	14960.83	14983.36	14909.15	14960.6	2594	2606	2594	2606	1124	1124	1121.15	1121.15	871	872.35	871	871	248.1	248.1	248.1	248.1
24	2018-01-03 14:49-PM	14960.6	14960.6	14909.15	14960.14	2606	2606	2592.94	2592.94	1121.15	1121.15	1121.15	1121.15	871	872.35	869.14	869.14	248.1	248.1	248.1	248.1
25	2018-01-03 14:50-PM	14960.14	14960.14	14885.25	14960	2592.94	2599.5	2592.94	2592.94	1121.15	1121.15	1121	1121	869.14	872	869.14	869.14	248.1	248.1	246.58	246.58
26	2018-01-03 14:51-PM	14960	14960	14868.31	14880	2592.94	2599	2588.58	2599	1121	1121	1119.53	1119.53	869.14	869.14	869.14	869.14	246.58	246.58	246.58	246.58
27	2018-01-03 14:52-PM	14880	14909.15	14850	14905	2599	2599	2588.58	2588.58	1119.53	1119.53	1119.53	1119.53	869.14	872	869.14	870	246.58	246.58	246.12	246.12
28	2018-01-03 14:53-PM	14905	14909.15	14850	14909.15	2588.58	2590.45	2586.24	2586.24	1119.53	1124	1119.39	1119.39	870	872	870	870	246.12	246.58	246.12	246.58
29	2018-01-03 14:54-PM	14909.15	14946.13	14863.13	14880	2586.24	2586.24	2586.24	2586.24	1119.39	1119.39	1119.39	1119.39	870	873.55	870	872	246.58	246.58	246.12	246.12

Note: CloseBTC was then shifted up by 1 for prediction in the NN.

Optimising model performance:

- Add 20 features (all the OCLH features but at t-1)
- More layers, more hidden neurons