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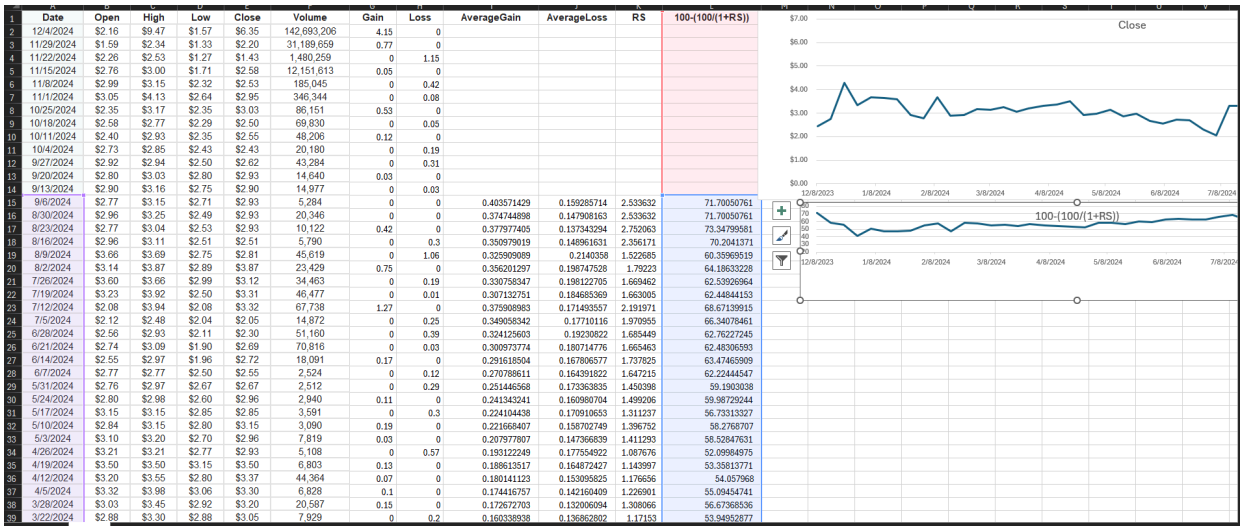
Professor Byron Hoy, Data Structures and Algorithms I

In this report I will cover the program that I created in order to simulate the trading of stocks. Within the program with the stock data that I had I was able to create a method to calculate the RSI, the simple moving average, and the change in price day to day.



Date	Open	High	Low	Close	Volume	Gain	Loss	AverageGain	AverageLoss	RS	100-(100/(1+RS))
12/4/2024	$2.16	$9.47	$1.57	$6.35	142,693,206	4.15	0				
11/29/2024	$1.59	$2.34	$1.33	$2.20	31,189,659	0.77	0				
11/22/2024	$2.26	$2.53	$1.27	$1.43	1,480,259	0	1.15				
11/15/2024	$2.76	$3.00	$1.71	$2.58	12,151,613	0.05	0				
11/8/2024	$2.99	$3.15	$2.32	$2.53	185,045	0	0.42				
11/1/2024	$3.05	$4.13	$2.64	$2.95	346,344	0	0.08				
10/25/2024	$2.35	$3.17	$2.35	$3.03	86,151	0.53	0				
10/18/2024	$2.58	$2.77	$2.29	$2.50	69,830	0	0.05				
10/11/2024	$2.40	$2.93	$2.35	$2.55	48,206	0.12	0				
10/4/2024	$2.73	$2.85	$2.43	$2.43	20,180	0	0.19				
9/27/2024	$2.92	$2.94	$2.50	$2.62	43,284	0	0.31				
9/20/2024	$2.80	$3.03	$2.80	$2.93	14,640	0.03	0				
9/13/2024	$2.90	$3.16	$2.75	$2.90	14,977	0	0.03				
9/6/2024	$2.77	$3.15	$2.71	$2.93	5,284	0	0	0.403571429	0.159285714	2.533632	71.70050761
8/30/2024	$2.96	$3.25	$2.49	$2.93	20,346	0	0	0.374744898	0.147908163	2.533632	71.70050761
8/23/2024	$2.77	$3.04	$2.53	$2.93	10,122	0.42	0	0.377977405	0.137343294	2.752063	73.34799581
8/16/2024	$2.96	$3.11	$2.51	$2.51	5,790	0	0.3	0.350979019	0.148961631	2.356171	70.2041371
8/9/2024	$3.66	$3.69	$2.75	$2.81	45,619	0	1.06	0.329909089	0.2140358	1.522685	60.35969519
8/2/2024	$3.14	$3.87	$2.89	$3.87	23,429	0.75	0	0.356201297	0.198747528	1.79223	64.18633228
7/26/2024	$3.60	$3.66	$2.99	$3.12	34,463	0	0.19	0.330758347	0.198122705	1.669462	62.53926964
7/19/2024	$3.23	$3.92	$2.50	$3.31	46,477	0	0.01	0.307132751	0.184685369	1.663005	62.44844153
7/12/2024	$2.08	$3.94	$2.08	$3.32	67,738	1.27	0	0.375908983	0.171493557	2.191971	68.67139915
7/5/2024	$2.12	$2.48	$2.04	$2.05	14,872	0	0.25	0.349058342	0.17710116	1.970955	66.34078461
6/28/2024	$2.56	$2.93	$2.11	$2.30	51,160	0	0.39	0.324125603	0.19230822	1.685449	62.76227245
6/21/2024	$2.74	$3.09	$1.90	$2.69	70,816	0	0.03	0.300973774	0.180714776	1.665463	62.48306593
6/14/2024	$2.55	$2.97	$1.96	$2.72	18,091	0.17	0	0.291618504	0.167806577	1.737825	63.47465909
6/7/2024	$2.77	$2.77	$2.50	$2.55	2,524	0	0.12	0.270788611	0.164391822	1.647215	62.22444547
5/31/2024	$2.76	$2.97	$2.67	$2.67	2,512	0	0.29	0.251446568	0.173363835	1.450398	59.1903038
5/24/2024	$2.80	$2.98	$2.60	$2.96	2,940	0.11	0	0.241343241	0.160980704	1.499206	59.98729244
5/17/2024	$3.15	$3.15	$2.85	$2.85	3,591	0	0.3	0.224104438	0.170910653	1.311237	56.73313327
5/10/2024	$2.84	$3.15	$2.80	$3.15	3,090	0.19	0	0.221668407	0.158702749	1.396752	58.2768707
5/3/2024	$3.10	$3.20	$2.70	$2.96	7,819	0.03	0	0.207977607	0.147366839	1.411293	58.52847631
4/26/2024	$3.21	$3.21	$2.77	$2.93	5,108	0	0.57	0.193122249	0.177554922	1.087676	52.09984975
4/19/2024	$3.50	$3.50	$3.15	$3.50	6,803	0.13	0	0.188613517	0.164872427	1.143997	53.35813771
4/12/2024	$3.20	$3.55	$2.80	$3.37	44,364	0.07	0	0.180141123	0.153095825	1.176656	54.057968
4/5/2024	$3.32	$3.98	$3.06	$3.30	6,828	0.1	0	0.174416757	0.142160409	1.226901	55.09454741
3/28/2024	$3.03	$3.45	$2.92	$3.20	20,587	0.15	0	0.172672703	0.132006094	1.308066	56.67368536
3/22/2024	$2.88	$3.30	$2.88	$3.05	7,929	0	0.2	0.160338938	0.136862802	1.17153	53.94952877

From looking at the graph we can see that the RSI typically ranges from 40 to 60. There are a couple weeks where it is over traded and the RSI jumps to around 70. We can see a trend that when the RSI spikes up it usually follows with a decrease of price in the stock.

In this project I used 3 different algorithms with the trading bot to determine which one could yield the most profits. The first algorithm was to use 25% of the accounts capital and buy into a stock when the RSI was on the lower side but the SMA was moving upward and sell when the RSI began to near 60 and SMA's momentum was slowing down. With this method the user would have grown their 10,000$ account to 13,500 within 1 year.

The second Algorithm was to use the accounts 100% capital for a 1 year hold into the stock and sell it exactly 1 year later. With this method there were some jumps in price that a person would have wanted to sell at but missed. The bot bought into the stock at around 2.50$ a share and ended up selling at 6.35$ a share. This huge profit grew their account to 25,400$.

The final algorithm was for the bot to buy if the price today was lower than the price of yesterdays and hold until the stock was up 5% and then sell. This method seemed to be our only non profitable algorithm. With the stock trending down we bought lower and lower into the stock losing more than we were gaining on the sell. After the year had concluded the account was down around 2,200$ gone into the market.

In conclusion our second algorithm blew the other 2 out of the water but I don't think it would've been profitable if it was another stock on the last day of the year we got lucky with a huge jumped in price when the day before it was treading the one dollar mark and could've been in trouble of being delisted off the market. The first algorithm would have been the safer and consistently more profitable method. The third method in theory should have grown profitable but with the constant decreases in price if the stock was at a all time high we would buy in and as it continued downward more money was put in resulting in a loss of capital.