FE-511-A: Final Project

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PART 1
Trading on TDAmeritrade

Trading Strategies

- Butterfly Spread
- Straddle
- Fibonacci Retracement
- Stocks and Options

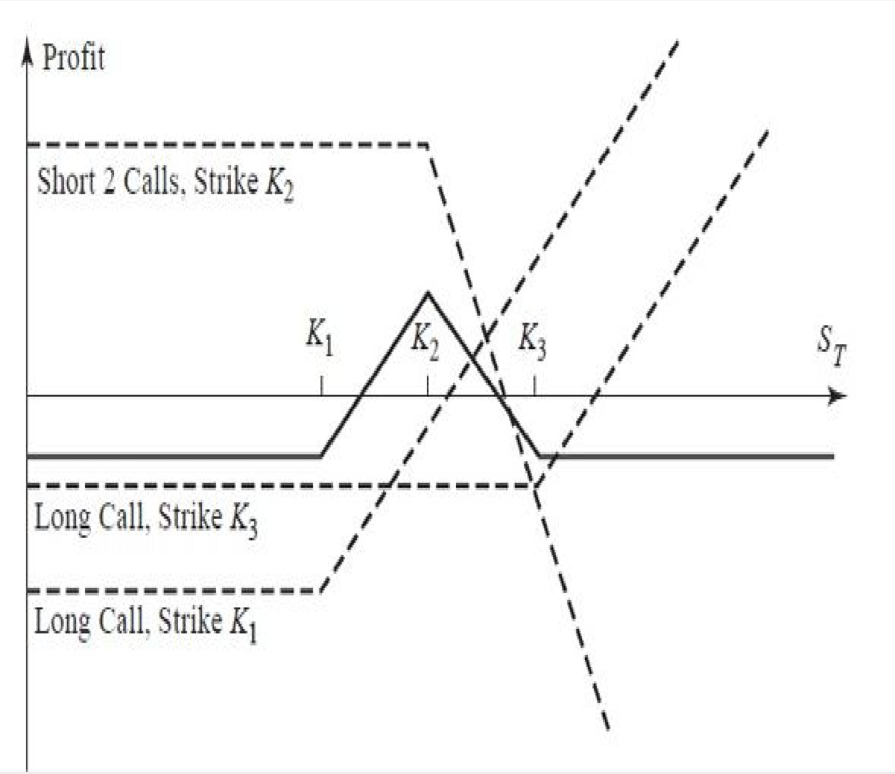
Butterfly Spread

Money invested in **Home Depot (HD)**

K1 = 122 :
Bought 100 calls at a strike price of 122 . Call price: $3.65

K3 = 130 :
Bought another 100 calls at a strike price of 130 . Call price: $0.03

K2 = 126 :
Shorted 200 options at a strike price of 126 (K2=126). Call price: $0.49



Straddle

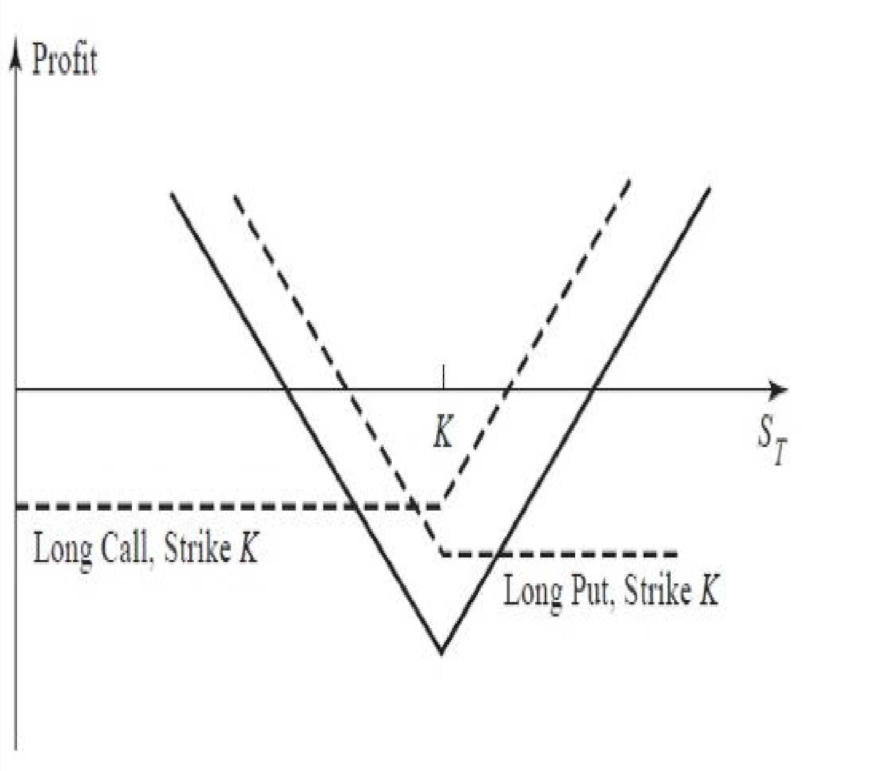
Money invested in **Cisco (CSCO)**

K = 31.5 :

Shorted 1000 calls at a strike price of 31.5
Call price: $0.74

K = 31.5 :

Shorted 1000 puts at a strike price of 31.5
Call price: $0.56



Fibonacci Retracement

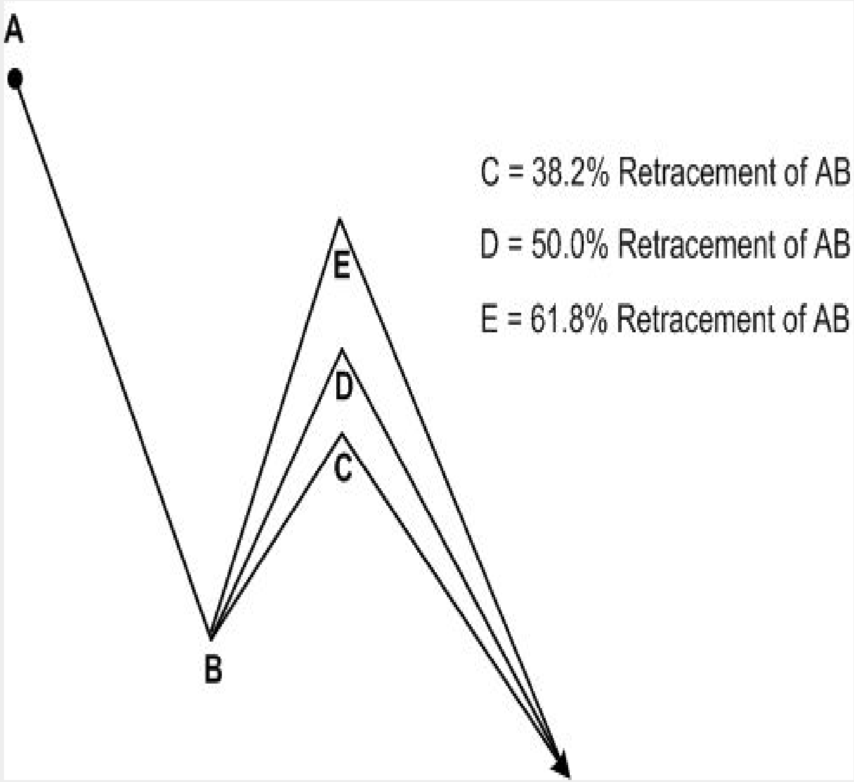
Money invested in **JPMorgan (JPM)**

A = 80 :

Bought 1000 calls at a strike price of 80
Call price: $0.26

B = 79 :

Bought 100 calls at a strike price of 79 Call price: $0.59



Stocks & Options

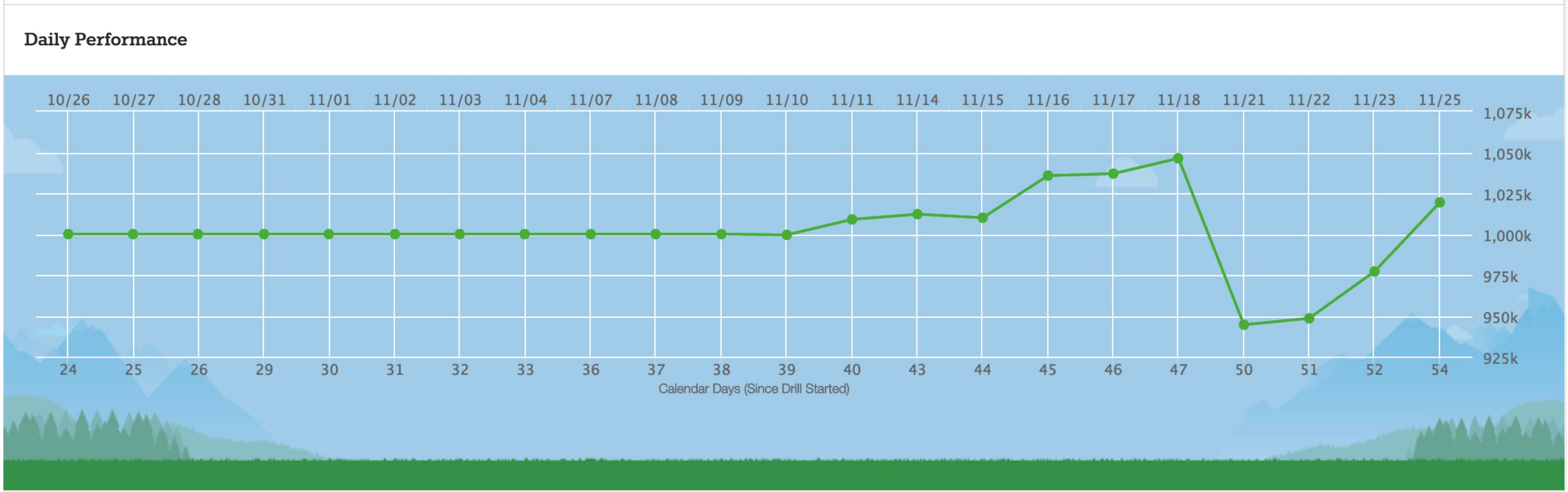
Spread	Side	Symbol	Qty	Type	Price
STOCK	BUY	APPL	100	STOCK	108.03
STOCK	BUY	APPL	100	STOCK	107.85
STOCK	SELL	APPL	100	STOCK	108.15
STOCK	BUY	APPL	100	STOCK	108.30
STOCK	SELL	APPL	100	STOCK	108.40

All Stocks

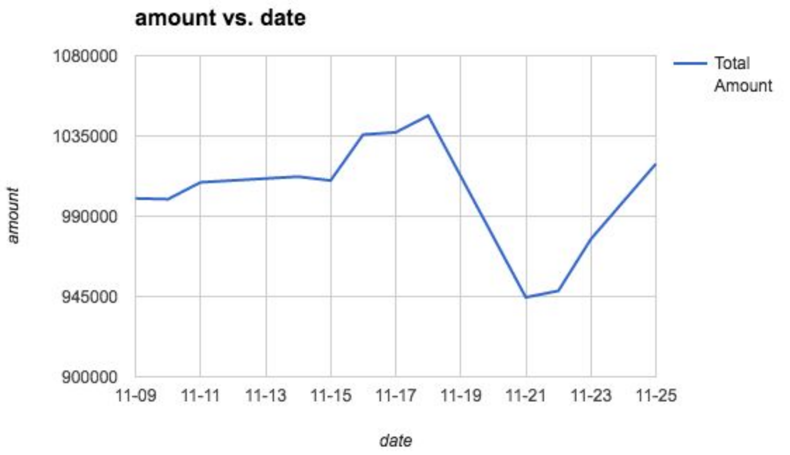
Profits and Losses | $32,507.00 | by Symbol

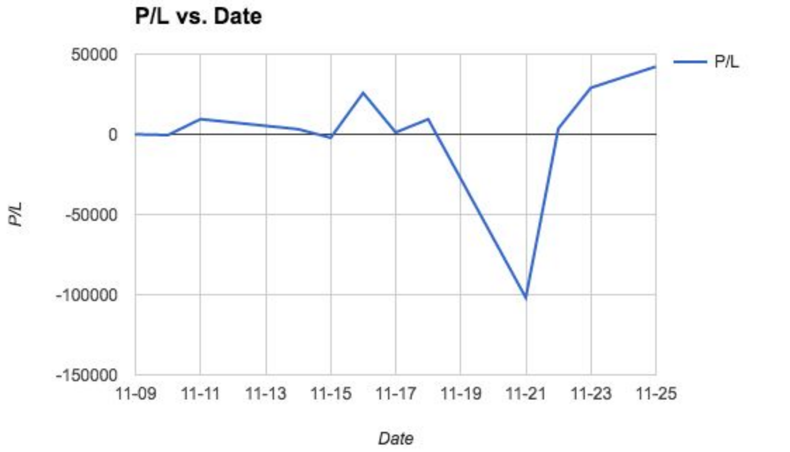
Symbol	Description	P/L Open	P/L %	P/L Day	P/L YTD	P/L Diff	Margin Req	Mark Value
AAPL	APPLE INC COM	$0.00	0.00%	$0.00	$87.00	$87.00	$0.00	$0.00
CSCO	CISCO SYSTEMS INC COM	($4,500.00)	-3.46%	$0.00	($4,500.00)	($4,500.00)	$733,500.00	($134,500.00
DIS	WALT DISNEY CO COM	$0.00	0.00%	$0.00	$16,500.00	$16,500.00	$0.00	$0.00
HD	HOME DEPOT INC COM	$0.00	0.00%	$0.00	($9,900.00)	($9,900.00)	$0.00	$0.00
JPM	JP MORGAN CHASE & CO COM	($27,800.00)	-87.15%	$3,550.00	($27,800.00)	($27,800.00)	$0.00	$4,100.00
KO	COCA COLA CO COM	($1,080.00)	-90.00%	$40.00	($1,080.00)	($1,080.00)	$0.00	$120.00
MCD	MCDONALDS CORP COM	$0.00	0.00%	$0.00	$64,000.00	$64,000.00	$0.00	$0.00
NKE	NIKE INC CL B	$0.00	0.00%	$0.00	($4,800.00)	($4,800.00)	$0.00	$0.00
	OVERALL TOTALS	($33,380.00)	-20.47%	$3,590.00	$32,507.00	$32,507.00	$733,500.00	($130,280.00

Daily Performance



Date	Total Amount	P/L	Positions
11-09	1000000	0	
11-10	999543.62	-456.38	BOT +100 DIS 100 (Weeklys) 25 NOV 16 95.5 CALL @1.65 BOT +50 NKE 100 (Weeklys) 25 NOV 16 51.5 PUT @1.04 BOT +80 KO 100 18 NOV 16 42 CALL @.15
11-11	1008995.31	9451.69	BOT +200 AAPL SOLD -100 AAPL @108.15 BOT +100 AAPL @108.20 SOLD -200 AAPL @108.40
11-14	1012195.31	3200	
11-15	1010020.31	-2175	
11-16	1035796.53	25776.22	SOLD -200 HD 100 18 NOV 16 126 CALL @.49 BOT +100 HD 100 18 NOV 16 130 CALL @.03 BOT +100 HD 100 18 NOV 16 122 CALL @3.60 BOT +1,000 MCD 100 (Weeklys) 25 NOV 16 119 CALL @.94 SOLD -1,000 CSCO 100 18 NOV 16 31.5 CALL @.74 SOLD -1,000 CSCO 100 18 NOV 16 31.5 PUT @.56 BOT +1,000 JPM 100 (Weeklys) 25 NOV 16 80 CALL @.26
11-17	1036995.93	1199.4	BOT +100 JPM 100 (Weeklys) 25 NOV 16 79 CALL @.59
11-18	1046392.45	9396.52	SOLD -100 BUTTERFLY HD 100 18 NOV 16 122/126/130 CAL
11-21	944537.45	-101855	
11-22	948152.45	3615	
11-23	977152.45	29000	
11-25	1019402.3	42249.85	SOLD -100 DIS 100 (Weeklys) 25 NOV 16 95.5 CALL @3.30 SOLD -1,000 MCD 100 (Weeklys) 25 NOV 16 119 CALL @1.58 SOLD -50 NKE 100 (Weeklys) 25 NOV 16 51.5 PUT @.08





Date: 11/14/2016

Rank	Name	P&L (%)	P&L ($)	Net Liquidity ($)
1	BetaGo	+7.35%	+$73,498.38	$1,073,498.38
2	Bull Team	+2.22%	+$22,244.87	$1,022,244.87
3	Team Alpha	+1.94%	+$19,402.30	$1,019,402.30
4	Pirate	+1.90%	+$19,042.40	$1,019,042.40

Date: 11/16/2016

Rank	Name	P&L (%)	P&L ($)	Net Liquidity ($)
1	BetaGo	+7.30%	+$72,996.33	$1,072,996.33
2	Team Alpha	+4.19%	+$41,915.93	$1,041,915.93
3	Bull Team	+1.44%	+$14,389.84	$1,014,389.84
4	Pirate	+0.74%	+$7,391.40	$1,007,391.40

Date: 11/25/2016

Rank	Name	P&L (%)	P&L ($)	Net Liquidity ($)
1	BetaGo	+7.39%	+$73,896.38	$1,073,896.38
2	Bull Team	+2.37%	+$23,700.37	$1,023,700.37
3	Pirate	+1.96%	+$19,595.40	$1,019,595.40
4	Team Alpha	+1.94%	+$19,402.30	$1,019,402.30

PART 2.1
Portfolio Analysis

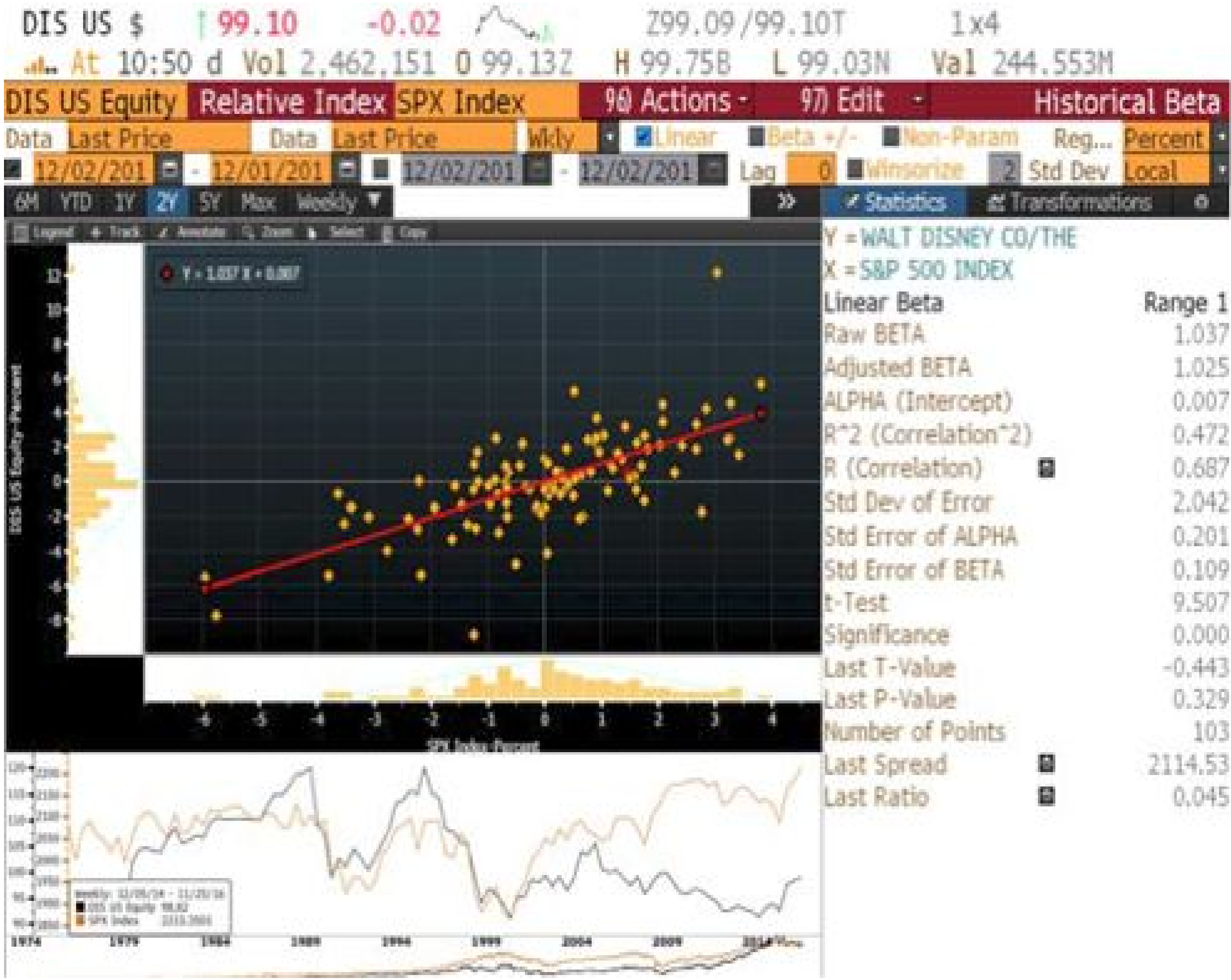
1. The stock of interest: **Disney (NYSE: DIS)**

- Type: Price; Period: Daily; Select: Statistics check box to show Histogram window
- Type: Historical Volatility; Level 30 Days; Period: Daily; Select: Statistics

We observed the data from the period 06/01/2016 to 12/01/2016. The historical volatility has a low of 8.665 in the period while the price has a low of 90.83. In the same period, the historical volatility has a high of 17.295 while the price has a high of 100.20. At these extreme points, the historical volatility values seem to mirror the graph the price.

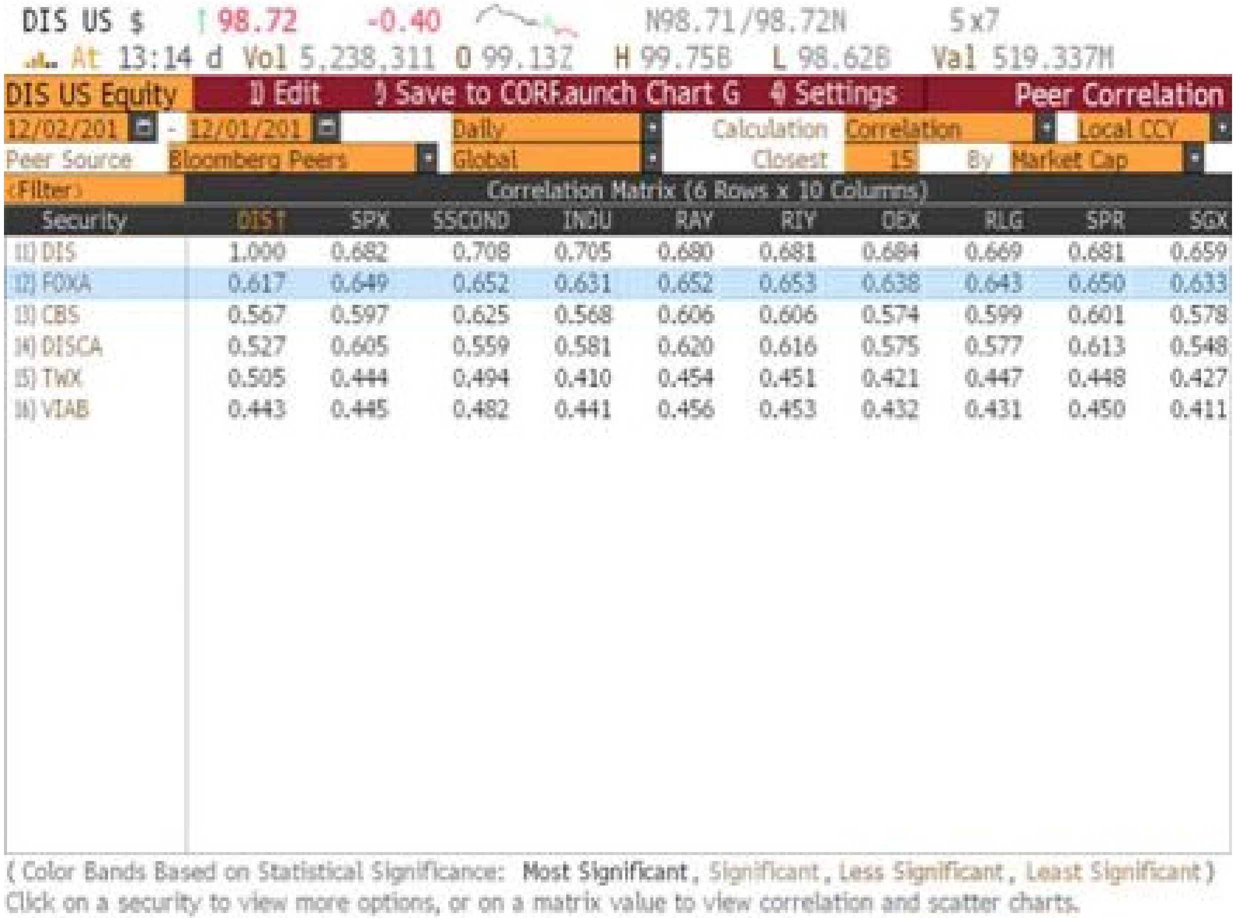
2. The stock of interest: **Disney (DIS)**

- The time period for the regression is 12/02/2014 to 12/01/2016.
- Variation in the equity is about 47%, explained by changes in the S&P 500 as the value of R^2 as 0.472.
- The equity will on average be more volatile than the index. This factor follows from the slope of the regression line of 1.037
- When we click BETA +/- checkbox on the BETA screen, the below output is displayed. We find that BETA+ is 1.186, BETA- is 0.916 and the convexity is found to be 0.135.



3. Select a stock of interest and compare its correlation with the market, systematic risk (use R_2),alpha, and beta with its peers using the PC screen.

- we observe that it has a very high positive correlation of 0.687. Disney is highly correlated with the S&P 500 which represents the market.
- Variation in the equity is about 47%, explained by changes in the S&P 500 as the value of R^2 as 0.472.
- The equity will on average be more volatile than the index. This factor follows from the slope of the regression line of 1.037



Security	DIS†	SPX	SSCOND	INDU	RAY	RIY	OEX	RLG	SPR	SGX
11) DIS	1.000	0.682	0.708	0.705	0.680	0.681	0.684	0.669	0.681	0.659
12) FOXA	0.617	0.649	0.652	0.631	0.652	0.653	0.638	0.643	0.650	0.633
13) CBS	0.567	0.597	0.625	0.568	0.606	0.606	0.574	0.599	0.601	0.578
14) DISCA	0.527	0.605	0.559	0.581	0.620	0.616	0.575	0.577	0.613	0.548
15) TWX	0.505	0.444	0.494	0.410	0.454	0.451	0.421	0.447	0.448	0.427
16) VIAB	0.443	0.445	0.482	0.441	0.456	0.453	0.432	0.431	0.450	0.411

4. Portfolio with stocks making up the S&P 500 with a market cap greater than $15 billion

4a. Historical Performance of the Portfolio

We performed the historical analysis on the portfolio. We observed the data from 2000 to 2016. The total Return has been on a rise ever since 2000.

4b. Historical Performance of the fund relative to an index (INDU)

We observe that the fund over performs the index (INDU). For the same duration, its Total Return is well over 500% while the Total return of the index (INDU) is just about 100%.

4c. Historical performance of the portfolio for different periods relative to the index

Period Analysis

	Up	Down	Total
Number	2356	1819	4175
Percentage	56.43	43.57	100
Average	0.7	-0.8	0.05
Standard Dev.	0.81	0.9	1.13
Max Sequence	10	8	10
Avg Sequence	2.21	1.71	1.96

Best-Worst

	Performance	Date
Best 1	9.48	10/13/2008
Best 2	8.97	03/10/2009
Best 3	7.68	10/28/2008
Worst 1	-8.67	12/01/2008
Worst 2	-8.16	10/15/2008
Worst 3	-7.55	11/19/2008

	3 Months		6 Months		Year To Date		1 Year	
Portfolio Statistics	Port	Bench	Port	Bench	Port	Bench	Port	Bench
2. Return								
Total Return	0.52	4.35	4.42	8.90	8.70	12.90	7.68	11.06
Maximum Return	2.35	2.08	2.35	2.08	2.42	2.47	2.42	2.47
Minimum Return	-2.46	-2.13	-3.78	-3.39	-3.78	-3.39	-3.78	-3.39
Mean Return (Annualized)	3.88	28.00	13.92	27.87	15.00	21.58	12.43	17.19
Mean Excess Return (Annualized	-18.85		-10.91		-5.42		-4.06	
3. Risk								
Standard Deviation (Annualized	11.50	10.55	11.92	10.93	13.88	12.91	14.18	13.38
Downside Risk (Annualized)	8.08	7.48	8.91	8.05	10.19	9.46	10.39	9.81
Skewness	-0.07	-0.12	-0.93	-0.82	-0.44	-0.41	-0.38	-0.37
VaR 95% (ex-post)	-0.78	-1.04	-0.78	-0.81	-1.46	-1.38	-1.49	-1.42
Tracking Error (Annualized)	4.73		4.01		4.69		4.63	
4. Risk/Return								
Sharpe Ratio	0.21	1.80	0.79	1.73	0.74	1.14	0.60	0.88
Jensen Alpha	-16.43		-9.96		-4.67		-3.29	
Information Ratio	-2.93		-1.98		-0.83		-0.63	
Treynor Measure	0.02		0.09		0.10		0.08	
Beta (ex-post)	0.99		1.03		1.01		1.00	
Correlation	0.9113		0.9421		0.9413		0.9453	
Capture Ratio	0.82		0.84		0.80		0.81	

4d. Returns for different periods of each sector

4e. Returns and Standard Deviations for different periods for each stock

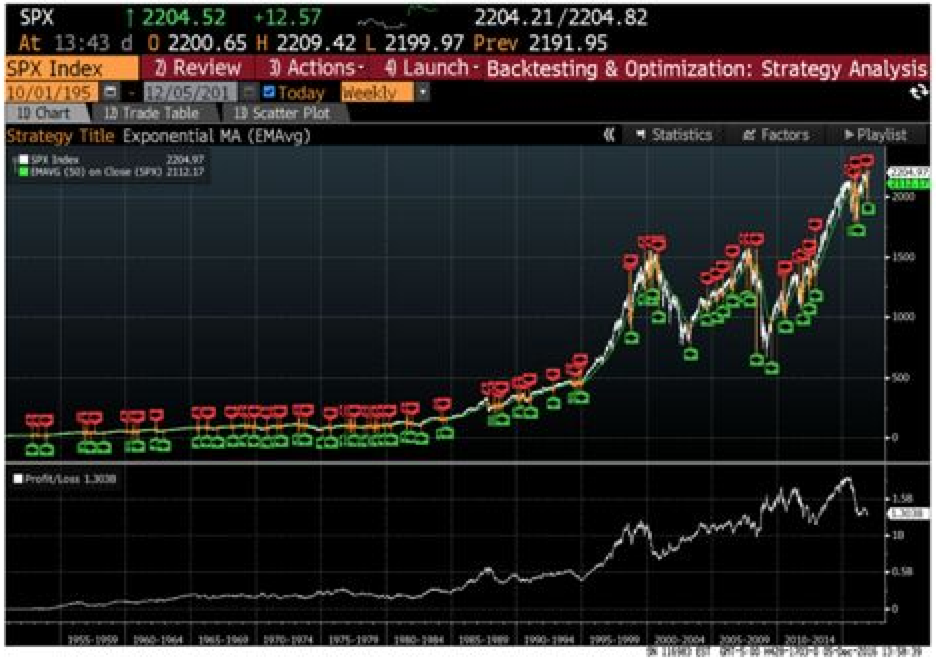
Name	% End Wgt Port	% End Wgt Bmrk	% End Wgt +/-	Tot Rtn 1D Port	Tot Rtn 1D Bmrk	Tot Rtn 1D +/-	Tot Rtn MTD Port	Tot Rtn MTD Bmrk	Tot Rtn MTD +/-	Tot Rtn YTD Port	Tot Rtn YTD Bmrk	Tot Rtn YTD +/-
PRTU DAM	100.00	100.00	0.00	0.06	-0.11	0.17	-0.51	0.25	-0.76	8.70	12.90	-4.20
Consume...	19.46	14.18	5.27	-0.35	-0.12	-0.24	-1.02	-0.15	-0.87	9.59	-3.16	12.75
Consume...	7.08	6.92	0.17	0.64	0.49	0.15	-0.35	0.21	-0.56	0.83	8.47	-7.64
Energy	5.07	7.15	-2.08	0.22	-0.24	0.46	0.19	0.59	-0.41	30.10	23.93	6.17
Financials	12.22	17.59	-5.38	-0.91	-0.78	-0.13	0.29	1.57	-1.28	16.46	17.05	-0.59
Health C...	16.60	13.06	3.54	0.18	0.25	-0.07	-0.66	0.69	-1.35	-6.98	22.54	-29.52
Industrials	12.37	19.98	-7.61	0.06	-0.13	0.20	0.66	0.55	0.12	25.77	17.56	8.21
Informat...	13.76	16.73	-2.97	0.46	0.25	0.21	-1.93	-1.38	-0.56	8.92	9.94	-1.03
Materials	4.45	2.61	1.83	-0.04	-0.67	0.63	-0.07	-0.65	0.58	15.02	12.39	2.63
Real Est...	5.20		5.20	1.01		1.01	-0.61		-0.61	-0.93		-0.93
Telecom...	0.47	1.78	-1.31	0.21	-0.12	0.33	0.45	-0.18	0.63	10.08	12.64	-2.56
Utilities	3.33		3.33	0.95		0.95	0.18		0.18	11.39		11.39
AMERICAN E	0.19		0.19	0.93		0.93	-0.59		-0.59	4.34		4.34
CONSOLIDA	0.23		0.23	0.32		0.32	-0.11		-0.11	12.50		12.50
DOMINION	0.24		0.24	1.42		1.42	0.67		0.67	13.39		13.39
DTE ENERGY	0.31		0.31	1.62		1.62	2.19		2.19	21.53		21.53
DUKE ENER	0.24		0.24	0.92		0.92	-0.47		-0.47	7.35		7.35
EDISON INT	0.23		0.23	1.23		1.23	0.92		0.92	19.51		19.51
EVERSOURC	0.17		0.17	1.14		1.14	0.12		0.12	3.70		3.70
EXELON COR	0.11		0.11	2.61		2.61	1.54		1.54	23.53		23.53

4f. Correlation of the stocks in the portfolio.

Security	AMZN	SPX	SSCOND	CCMP	NDX	RAY	RIY	OEX	RLG	SPR
11) AMZN	1.000	0.502	0.638	0.599	0.653	0.490	0.496	0.534	0.571	0.492
12) FB	0.603	0.518	0.560	0.592	0.643	0.501	0.509	0.549	0.579	0.506
13) MSFT	0.509	0.719	0.687	0.779	0.815	0.707	0.713	0.740	0.765	0.711
14) JNJ	0.298	0.586	0.483	0.517	0.517	0.571	0.578	0.614	0.558	0.579
15) GE	0.298	0.759	0.685	0.665	0.628	0.754	0.757	0.758	0.709	0.757
16) PG	0.292	0.533	0.442	0.450	0.473	0.509	0.520	0.556	0.503	0.523
17) CVX	0.285	0.643	0.504	0.531	0.503	0.636	0.640	0.646	0.547	0.640
18) JPM	0.271	0.785	0.653	0.692	0.625	0.786	0.785	0.780	0.696	0.787
19) BRK/B	0.256	0.794	0.675	0.669	0.625	0.786	0.788	0.798	0.714	0.795
20) BAC	0.255	0.728	0.618	0.653	0.576	0.738	0.734	0.714	0.641	0.733
21) WFC	0.250	0.691	0.599	0.595	0.523	0.694	0.691	0.691	0.599	0.694
22) XOM	0.239	0.585	0.411	0.445	0.414	0.573	0.579	0.594	0.474	0.581
23) VZ	0.229	0.491	0.422	0.391	0.398	0.477	0.484	0.493	0.466	0.486
24) T	0.215	0.463	0.400	0.351	0.365	0.444	0.454	0.473	0.431	0.457
25) WMT	0.114	0.348	0.342	0.290	0.303	0.332	0.339	0.357	0.336	0.341

PART 2.2
Backtesting Trading Strategy using Bloomberg API for Excel and Python

Exponential Moving Average of SPX



P/L Comparison