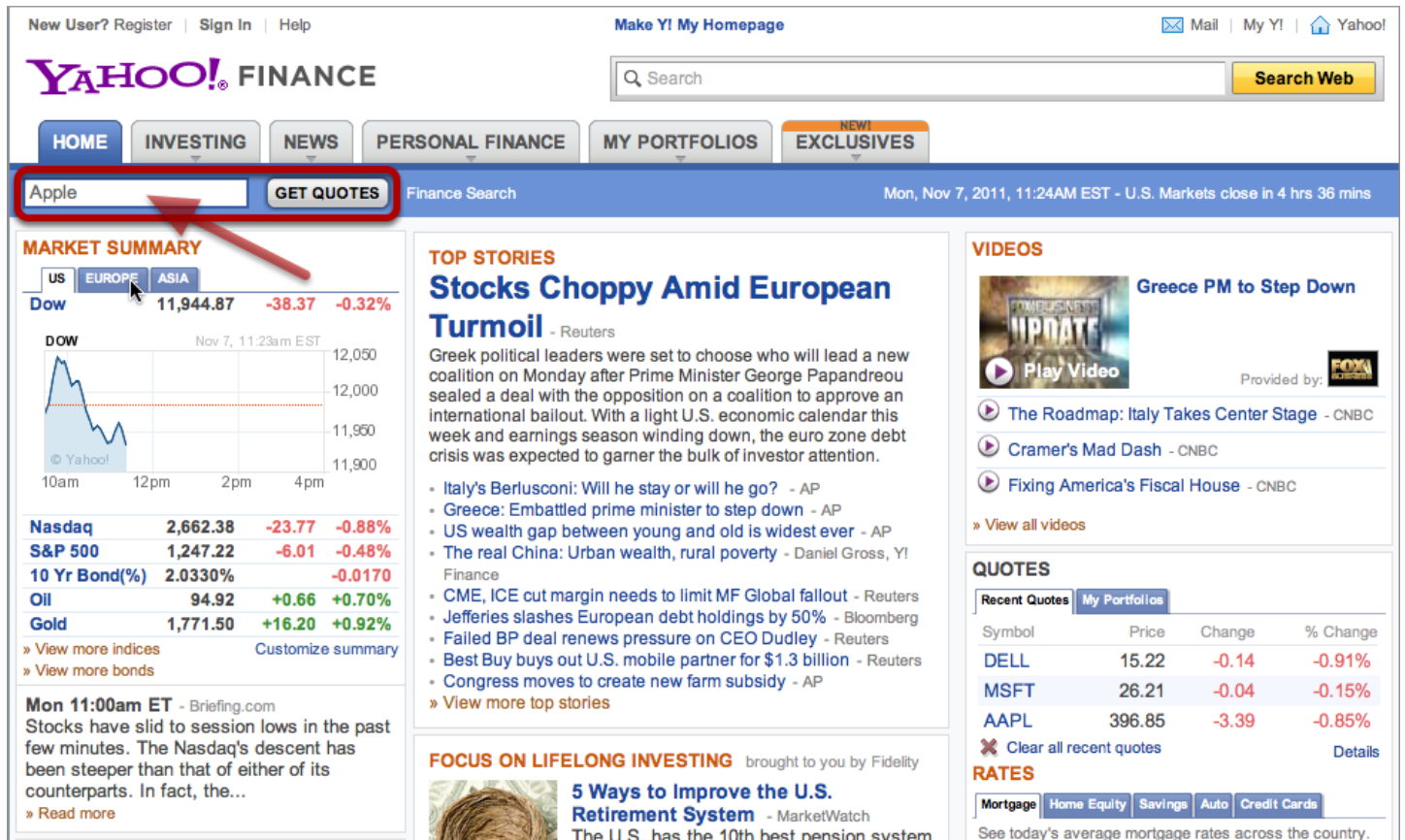


# VaR: Historical Simulation

Assalamu 'aleykum, everybody,

Here we are going to explain the steps for portfolio VaR calculation, inshaAllah.

## Step 1: Select a source for stock prices



The screenshot shows the Yahoo Finance homepage. At the top, there are navigation links: "New User? Register", "Sign In", "Help", "Make Y! My Homepage", "Mail", "My Y!", and "Yahoo!". Below these is the "YAHOO! FINANCE" logo and a search bar. The search bar contains the text "Apple" and a "GET QUOTES" button. A red arrow points to the "GET QUOTES" button. Below the search bar are several tabs: "HOME", "INVESTING", "NEWS", "PERSONAL FINANCE", "MY PORTFOLIOS", and "EXCLUSIVES". The "MARKET SUMMARY" section shows the Dow Jones index at 11,944.87, down 38.37 (-0.32%). Below this is a line chart of the Dow Jones index. To the right, the "TOP STORIES" section features the headline "Stocks Choppy Amid European Turmoil" with a sub-headline "Greek political leaders were set to choose who will lead a new coalition on Monday after Prime Minister George Papandreou sealed a deal with the opposition on a coalition to approve an international bailout. With a light U.S. economic calendar this week and earnings season winding down, the euro zone debt crisis was expected to garner the bulk of investor attention." Below the headline are several bullet points of news stories. To the right of the "TOP STORIES" is a "VIDEOS" section with a video player and a list of videos. Below the "TOP STORIES" is a "FOCUS ON LIFELONG INVESTING" section with a headline "5 Ways to Improve the U.S. Retirement System". At the bottom right, there is a "QUOTES" section with a table of stock prices and a "RATES" section with a table of mortgage rates.

Symbol	Price	Change	% Change
DELL	15.22	-0.14	-0.91%
MSFT	26.21	-0.04	-0.15%
AAPL	396.85	-3.39	-0.85%

Go to Yahoo Finance ([www.finance.yahoo.com/](http://www.finance.yahoo.com/))

Type in company name in highlighted window and Click Get Quotes.

For our example we will collect stock prices for three companies: Apple, Microsoft, and Dell.

## Step 2: Get Historical Prices

New User? Register | Sign In | Help [Make Y! My Homepage](#) Mail | My Y! | Yahoo!

**YAHOO! FINANCE** Search Search Web

Dow  $\downarrow$  0.44% Nasdaq  $\downarrow$  0.95%

HOME INVESTING NEWS PERSONAL FINANCE MY PORTFOLIOS EXCLUSIVES

GET QUOTES Finance Search Mon, Nov 7, 2011, 11:34AM EST - U.S. Markets close in 4 hrs 26 mins

### Apple Inc. (AAPL)

11:19AM EST: **397.11**  $\downarrow$  3.13 (0.78%)

**More On AAPL**

- QUOTES
- Summary
- Order Book
- Options
- Historical Prices**
- CHARTS
- Interactive
- Basic Chart
- Basic Tech. Analysis
- NEWS & INFO
- Headlines
- Financial Blogs
- Company Events
- Message Boards
- Market Pulse **NEW!**

**Apple Inc.** (NasdaqGS: AAPL)

REAL-TIME **396.23**  $\downarrow$  4.01 (-1.00%) 11:34AM EST

Last Trade: **397.11** Day's Range: **396.27 - 399.97**

Trade Time: **11:19AM EST** 52wk Range: **297.76 - 426.70**

Change:  $\downarrow$  3.13 (0.78%) Volume: **4,576,398**

Prev Close: **400.24** Avg Vol (3m): **22,121,000**

Open: **399.91** Market Cap: **369.02B**

Bid: **397.02 x 300** P/E (ttm): **14.35**

Ask: **397.17 x 300** EPS (ttm): **27.68**

1y Target Est: **502.55** Div & Yield: **N/A (N/A)**

People viewing **AAPL** also viewed:  
**GOOG AMZN PCLN CMG BIDU NKE**

Quotes delayed, except where indicated otherwise. Currency in USD.

**Add to Portfolio** Like 5k ?

**Apple Inc.**  
■ AAPL Nov 7, 11:18am EST

10am 12pm 2pm 4pm

1d 5d 3m 6m 1y 2y 5y max customize chart

**Comparison**

Click on Historical Prices as shown above.

## Step 3: Specify time range

HOME INVESTING NEWS PERSONAL FINANCE MY PORTFOLIOS EXCLUSIVES

GET QUOTES Finance Search Mon, Nov 7, 2011, 11:44AM EST - U.S. Markets close in 4 hrs 16 mins

### Apple Inc. (AAPL)

At 11:29AM EST: **396.60**  $\downarrow$  3.64 (0.91%)

**More On AAPL**

- QUOTES
- Summary
- Order Book
- Options
- Historical Prices**
- CHARTS
- Interactive
- Basic Chart
- Basic Tech. Analysis
- NEWS & INFO
- Headlines
- Financial Blogs
- Company Events
- Message Boards
- Market Pulse **NEW!**

**Historical Prices** Get Historical Prices for:  GO

**Set Date Range**

Start Date: Nov 7 2007 Eg. Jan 1, 2010

End Date: Nov 7 2011

☒ Daily  
☐ Weekly  
☐ Monthly  
☐ Dividends Only

Get Prices

First | Previous | Next | Last

Date	Open	High	Low	Close	Volume	Adj Close*
Nov 4, 2011	402.03	403.44	399.16	400.24	10,772,400	400.24
Nov 3, 2011	399.07	403.40	395.36	403.07	15,763,800	403.07
Nov 2, 2011	400.09	400.44	395.11	397.41	11,691,100	397.41
Nov 1, 2011	397.41	399.50	393.22	396.51	18,974,200	396.51
Oct 31, 2011	402.42	409.33	401.05	404.78	13,767,900	404.78

Set Data Range and Click Get Prices.

In our case we have chosen Start Date as 07 November 2007 and End Date as 07 November 2011.

Number of observations: 1008 (07/11/2007 - 07/11/2011)

#### Step 4: Download data to Spreadsheet

Aug 28, 2011	366.10	367.00	366.00	365.97	14,470,500	365.97
Aug 26, 2011	371.17	383.80	370.80	383.58	22,909,900	383.58
Aug 25, 2011	365.08	375.45	365.00	373.72	31,119,500	373.72
Aug 24, 2011	373.47	378.96	370.60	376.18	22,366,700	376.18
Aug 23, 2011	360.30	373.64	357.00	373.60	23,458,400	373.60
Aug 22, 2011	364.51	364.88	355.09	356.44	19,118,400	356.44
Aug 19, 2011	362.17	367.00	356.00	356.03	27,710,300	356.03
Aug 18, 2011	370.84	372.65	361.37	366.05	30,408,400	366.05
Aug 17, 2011	382.31	384.52	378.00	380.44	15,787,900	380.44
Aug 16, 2011	381.52	383.37	376.06	380.48	17,812,500	380.48
Aug 15, 2011	379.63	384.97	378.09	383.41	16,448,000	383.41
Aug 12, 2011	378.07	379.64	374.23	376.99	18,879,800	376.99
Aug 11, 2011	370.52	375.45	364.72	373.70	26,498,900	373.70
Aug 10, 2011	371.15	374.65	362.50	363.69	31,380,600	363.69
Aug 9, 2011	361.30	374.61	355.00	374.01	38,663,700	374.01
Aug 8, 2011	361.69	367.77	353.02	353.21	40,851,200	353.21
Aug 5, 2011	380.44	383.50	362.57	373.62	43,021,100	373.62
Aug 4, 2011	389.41	391.32	377.35	377.37	31,121,700	377.37

\* Close price adjusted for dividends and splits.

First | Previous | Next | Last

 Download to Spreadsheet

Currency in USD.

Click on Download to Spreadsheet at the bottom of the page.

Or Right Click and Save File as...

The file will be in CSV format which can be opened using Excel.

#### Step 5: Repeat the same steps with other stocks

Repeat the same steps to get stock prices of Microsoft and Dell.

## Step 6: Open downloaded files

	A	B	C	D	E	F	G	H
1	Date	Open	High	Low	Close	Volume	Adj Close	
2	04/11/2011	402.03	403.44	399.16	400.24	10772400	400.24	
3	03/11/2011	399.07	403.4	395.36	403.07	15763800	403.07	
4	02/11/2011	400.09	400.44	395.11	397.41	11691100	397.41	
5	01/11/2011	397.41	399.5	393.22	396.51	18974200	396.51	
6	31/10/2011	402.42	409.33	401.05	404.78	13767900	404.78	
7	28/10/2011	403	406.35	402.51	404.95	11515200	404.95	
8	27/10/2011	407.56	409	401.89	404.69	17666600	404.69	
9	26/10/2011	401.76	402.55	393.15	400.6	16279000	400.6	
10	25/10/2011	405.03	406.55	397.38	397.77	15372400	397.77	
11	24/10/2011	396.18	406.5	395.4	405.77	17933500	405.77	
12	21/10/2011	398.1	399.14	390.75	392.87	22161600	392.87	
13	20/10/2011	400	400.35	394.21	395.31	19616800	395.31	
14	19/10/2011	401.35	408.42	397.8	398.62	39407100	398.62	
15	18/10/2011	421.76	424.81	415.99	422.24	31232500	422.24	
16	17/10/2011	421.74	426.7	415.94	419.99	24478400	419.99	
17	14/10/2011	416.83	422	415.27	422	20450000	422	
18	13/10/2011	404.98	408.43	402.85	408.43	15177900	408.43	
19	12/10/2011	407.34	409.25	400.14	402.19	22206600	402.19	

**Open downloaded spreadsheet.**

You'll see seven columns as: Date, Open, High, Low, Close, Volume, and Adj.Close.

For our calculation of VaR, we are interested in the first and last columns only: Date and Adj.Close.

Other data will be deleted.

### Step 7: Combine all stock prices into a table

	A	B	C	D	E
1	Date	APPLE	MICROSOFT	DELL	
2	04/11/2011	400.24	26.25	15.36	
3	03/11/2011	403.07	26.53	15.67	
4	02/11/2011	397.41	26.01	15.45	
5	01/11/2011	396.51	25.99	15.13	
6	31/10/2011	404.78	26.63	15.81	
7	28/10/2011	404.95	26.98	16.31	
8	27/10/2011	404.69	27.25	16.32	
9	26/10/2011	400.60	26.59	15.91	
10	25/10/2011	397.77	26.81	15.61	
11	24/10/2011	405.77	27.19	15.70	
12	21/10/2011	392.87	27.16	15.24	
13	20/10/2011	395.31	27.04	15.05	
14	19/10/2011	398.62	27.13	15.90	
15	18/10/2011	422.24	27.31	16.37	
16	17/10/2011	419.99	26.98	15.97	
17	14/10/2011	422.00	27.27	16.62	
18	13/10/2011	408.43	27.18	16.36	
19	12/10/2011	402.19	26.96	16.24	
20	11/10/2011	400.29	27.00	16.18	
21	10/10/2011	388.81	26.94	16.10	
22	07/10/2011	369.80	26.25	15.28	

Copy and Paste stock prices of three companies to one table as it is shown above.

Remember that we are interested in Adjusted Close Prices only.



## Step 8: Calculate Stock Returns

F3				fx		=LN(B3/B4)			
	A	B	C	D	E	F	G	H	I
1		STOCK PRICES				STOCK RETURNS			
2	Date	APPLE	MICROSOFT	DELL		APPLE	MICROSOFT	DELL	
3	04/11/2011	400.24	26.25	15.36		-0.70%	-1.06%	-2.00%	
4	03/11/2011	403.07	26.53	15.67		1.41%	1.98%	1.41%	
5	02/11/2011	397.41	26.01	15.45		0.23%	0.08%	2.09%	
6	01/11/2011	396.51	25.99	15.13		-2.06%	-2.43%	-4.40%	
7	31/10/2011	404.78	26.63	15.81		-0.04%	-1.31%	-3.11%	
8	28/10/2011	404.95	26.98	16.31		0.06%	-1.00%	-0.06%	
9	27/10/2011	404.69	27.25	16.32		1.02%	2.45%	2.54%	
10	26/10/2011	400.60	26.59	15.91		0.71%	-0.82%	1.90%	
11	25/10/2011	397.77	26.81	15.61		-1.99%	-1.41%	-0.57%	
12	24/10/2011	405.77	27.19	15.70		3.23%	0.11%	2.97%	
13	21/10/2011	392.87	27.16	15.24		-0.62%	0.44%	1.25%	
14	20/10/2011	395.31	27.04	15.05		-0.83%	-0.33%	-5.49%	
15	19/10/2011	398.62	27.13	15.90		-5.76%	-0.66%	-2.91%	
16	18/10/2011	422.24	27.31	16.37		0.53%	1.22%	2.47%	
17	17/10/2011	419.99	26.98	15.97		-0.48%	-1.07%	-3.99%	
18	14/10/2011	422.00	27.27	16.62		3.27%	0.33%	1.58%	
19	13/10/2011	408.43	27.18	16.36		1.54%	0.81%	0.74%	
20	12/10/2011	402.19	26.96	16.24		0.47%	-0.15%	0.37%	
21	11/10/2011	400.29	27.00	16.18		2.91%	0.22%	0.50%	
22	10/10/2011	388.81	26.94	16.10		5.01%	2.59%	5.23%	
23	07/10/2011	369.80	26.25	15.28		-2.03%	-0.34%	-1.75%	
24	06/10/2011	377.37	26.34	15.55		-0.23%	1.72%	1.10%	
25	05/10/2011	378.25	25.89	15.38		1.53%	2.15%	5.69%	
26	04/10/2011	372.50	25.34	14.53		-0.56%	3.25%	4.36%	
27	03/10/2011	374.60	24.53	13.91		-1.78%	-1.46%	-1.64%	

Create new table and Calculate Stock Returns using Lognormal formula in Excel.

Lognormal of Today price divided by Yesterday price.

## Step 9: Calculate RM returns

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3																										
4	Date	STOCK PRICES				STOCK RETURNS				PORTFOLIO VALUE																
5		APPLE	MICROSOFT	DELL		APPLE	MICROSOFT	DELL		RM	100,000.00	RM	100,000.00	RM	100,000.00											
6										APPLE		MICROSOFT		DELL												
7	04/11/2011	400.24	26.25	15.36		-0.70%	-1.06%	-2.00%		-704.59		-1,061.02		-1,998.13												
8	03/11/2011	403.07	26.53	15.67		1.41%	1.98%	1.41%		1,414.18		1,979.51		1,413.91												
9	02/11/2011	397.41	26.01	15.45		0.23%	0.08%	2.09%		226.72		76.92		2,092.95												
10	01/11/2011	396.51	25.99	15.13		-2.06%	-2.43%	-4.40%		-2,064.24		-2,432.66		-4,396.31												
11	31/10/2011	404.78	26.63	15.81		-0.04%	-1.31%	-3.11%		-41.99		-1,305.75		-3,113.58												
12	28/10/2011	404.95	26.98	16.31		0.06%	-1.00%	-0.06%		64.23		-995.77		-61.29												
13	27/10/2011	404.69	27.25	16.32		1.02%	2.45%	2.54%		1,015.79		2,451.83		2,544.35												
14	26/10/2011	400.60	26.59	15.91		0.71%	-0.82%	1.90%		708.95		-823.97		1,903.61												
15	25/10/2011	397.77	26.81	15.61		-1.99%	-1.41%	-0.57%		-1,991.25		-1,407.43		-574.90												
16	24/10/2011	405.77	27.19	15.70		3.23%	0.11%	2.97%		3,230.77		110.40		2,973.72												
17	21/10/2011	392.87	27.16	15.24		-0.62%	0.44%	1.25%		-619.15		442.81		1,254.56												
18	20/10/2011	395.31	27.04	15.05		-0.83%	-0.33%	-5.49%		-833.83		-332.29		-5,494.11												
19	19/10/2011	398.62	27.13	15.90		-5.76%	-0.66%	-2.91%		-5,756.53		-661.28		-2,913.13												
20	18/10/2011	422.24	27.31	16.37		0.53%	1.22%	2.47%		534.30		1,215.71		2,473.84												
21	17/10/2011	419.99	26.98	15.97		-0.48%	-1.07%	-3.99%		-477.44		-1,069.13		-3,989.48												
22	14/10/2011	422.00	27.27	16.62		3.27%	0.33%	1.58%		3,268.48		330.58		1,576.75												
23	13/10/2011	408.43	27.18	16.36		1.54%	0.81%	0.74%		1,539.59		812.71		736.20												
24	12/10/2011	402.19	26.96	16.24		0.47%	-0.15%	0.37%		473.53		-148.26		370.14												
25	11/10/2011	400.29	27.00	16.18		2.91%	0.22%	0.50%		2,909.85		222.47		495.66												
26	10/10/2011	388.81	26.94	16.10		5.01%	2.59%	5.23%		5,012.85		2,594.62		5,227.45												
27	07/10/2011	369.80	26.25	15.28		-2.03%	-0.34%	-1.75%		-2,026.38		-342.27		-1,751.59												
28	06/10/2011	377.37	26.34	15.55		-0.23%	1.72%	1.10%		-232.92		1,723.19		1,099.27												
29	05/10/2011	378.25	25.89	15.38		1.53%	2.15%	5.69%		1,531.83		2,147.26		5,685.25												
30	04/10/2011	372.50	25.34	14.53		-0.56%	3.25%	4.36%																		

Calculate what would have been the result if we had invested RM100,000 in each stock 4 years ago.

Multiply 100,000 by each stock return.

For example:

100,000 x cell F4 (for Apple's stock),

100,000 x cell G4 (for Microsoft's stock),

100,000 x cell H4 (for Dell's stock).

## Step 10: Calculate Portfolio returns

	E	F	G	H	I	J	K	L	M	N	O	P
1	PORTFOLIO VALUE											
2	STOCK RETURNS			RM 100,000.00			RM 100,000.00			RM 300,000.00		
3	APPLE	MICROSOFT	DELL	APPLE	MICROSOFT	DELL	APPLE	MICROSOFT	DELL	PORTFOLIO (RM)	PORTFOLIO (%)	
4	-0.70%	-1.06%	-2.00%	-704.59	-1,061.02	-1,998.13				-3,763.74	-1.25%	
5	1.41%	1.98%	1.41%	1,414.18	1,979.51	1,413.91				4,807.59	1.60%	
6	0.23%	0.08%	2.09%	226.72	76.92	2,092.95				2,396.59	0.80%	
7	-2.06%	-2.43%	-4.40%	-2,064.24	-2,432.66	-4,396.31				-8,893.21	-2.96%	
8	-0.04%	-1.31%	-3.11%	-41.99	-1,305.75	-3,113.58				-4,461.31	-1.49%	
9	0.06%	-1.00%	-0.06%	64.23	-995.77	-61.29				-992.83	-0.33%	
10	1.02%	2.45%	2.54%	1,015.79	2,451.83	2,544.35				6,011.97	2.00%	
11	0.71%	-0.82%	1.90%	708.95	-823.97	1,903.61				1,788.58	0.60%	
12	-1.99%	-1.41%	-0.57%	-1,991.25	-1,407.43	-574.90				-3,973.58	-1.32%	
13	3.23%	0.11%	2.97%	3,230.77	110.40	2,973.72				6,314.88	2.10%	
14	-0.62%	0.44%	1.25%	-619.15	442.81	1,254.56				1,078.21	0.36%	
15	-0.83%	-0.33%	-5.49%	-833.83	-332.29	-5,494.11				-6,660.23	-2.22%	
16	-5.76%	-0.66%	-2.91%	-5,756.53	-661.28	-2,913.13				-9,330.94	-3.11%	
17	0.53%	1.22%	2.47%	534.30	1,215.71	2,473.84				4,223.85	1.41%	
18	-0.48%	-1.07%	-3.99%	-477.44	-1,069.13	-3,989.48				-5,536.06	-1.85%	
19	3.27%	0.33%	1.58%	3,268.48	330.58	1,576.75				5,175.80	1.73%	
20	1.54%	0.81%	0.74%	1,539.59	812.71	736.20				3,088.50	1.03%	
21	0.47%	-0.15%	0.37%	473.53	-148.26	370.14				695.42	0.23%	
22	2.91%	0.22%	0.50%	2,909.85	222.47	495.66				3,627.98	1.21%	
23	5.01%	2.59%	5.23%	5,012.85	2,594.62	5,227.45				12,834.91	4.28%	
24	-2.03%	-0.34%	-1.75%	-2,026.38	-342.27	-1,751.59				-4,120.24	-1.37%	
25	-0.23%	1.72%	1.10%	-232.92	1,723.19	1,099.27				2,589.54	0.86%	
26	1.53%	2.15%	5.69%	1,531.83	2,147.26	5,685.25				9,364.34	3.12%	
27	-0.56%	3.25%	4.36%	-562.18	3,248.73	4,360.75				7,047.30	2.35%	
28	-1.78%	-1.46%	-1.64%	-1,778.01	-1,456.93	-1,639.97				-4,874.90	-1.62%	
29	-2.40%	-2.22%	-5.03%	-2,396.83	-2,224.96	-5,033.81				-9,655.60	-3.22%	
30	-1.64%	-0.51%	-0.20%	-1,635.43	-509.51	-201.55				-2,346.48	-0.78%	
31	-0.57%	-0.35%	-1.80%	-565.14	-351.22	-1,795.86				-2,712.21	-0.90%	
32	-0.97%	0.90%	2.81%	-974.55	900.03	2,807.67				2,733.15	0.91%	
33	-0.28%	1.50%	2.40%	-279.89	1,504.98	2,401.49				3,626.58	1.21%	

Sum up results from previous table to calculate daily portfolio returns in RM, and resulting percentage out RM300,000.

For example:

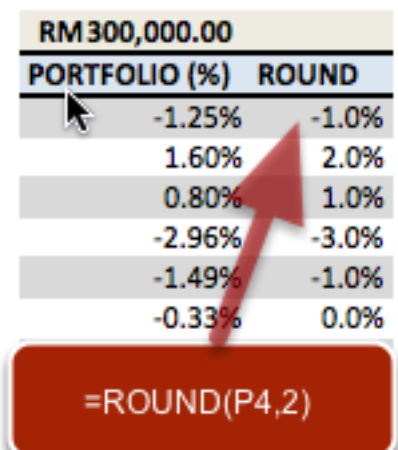
To calculate PORTFOLIO (RM), sum up cell J4 + cell K4 + cell L4.

To calculate PORTFOLIO (%), (cell N4 / 300,000)\*100



## Step 11: Round Portfolio returns

	O	P	Q
1			
2		RM 300,000.00	
3		PORTFOLIO (%)	ROUND
4		-1.25%	-1.0%
5		1.60%	2.0%
6		0.80%	1.0%
7		-2.96%	-3.0%
8		-1.49%	-1.0%
9		-0.33%	0.0%
10			
11			
12			
13		2.10%	2.0%
14		0.36%	0.0%
15		-2.22%	-2.0%
16		-3.11%	-3.0%
17		1.41%	1.0%
18		-1.85%	-2.0%
19		1.73%	2.0%
20		1.03%	1.0%
21		0.23%	0.0%



=ROUND(P4,2)

### Round Portfolio returns using ROUND Excel formula.

For example,  
in cell Q4 type "=" sign and type ROUND(P4,2).

Where,

P4 is cell P4.

2 is number of digits.

## Step 12: Create bins and calculate frequency

	O	P	Q	R	S	T
1						
2		RI 300,000.00				
3		<b>PORTFOLIO (%)</b>	<b>ROUND</b>			
4		-1.25%	-1.0%			
5		1.60%	2.0%			
6		0.80%	1.0%			
7		-2.96%	-3.0%			
8		-1.49%	-1.0%			
9		-0.33%	0.0%			
10		2.00%	2.0%			
11		0.60%	1.0%			
12		-1.32%	-1.0%			
13		2.10%	2.0%			
14		0.36%	0.0%			
15		-2.22%	-2.0%			
16		-3.11%	-3.0%			
17		1.41%	1.0%			
18		-1.85%	-2.0%			
19		1.73%	2.0%			
20		1.03%	1.0%			
21		0.23%	0.0%			
22		1.21%	1.0%			
23		4.28%	4.0%			
24		-1.37%	-1.0%			
25		0.86%	1.0%			
26		3.12%	3.0%			
27		2.35%	2.0%			
28		-1.62%	-2.0%			
29		-3.22%	-3.0%			
30		-0.78%	-1.0%			
31		-0.90%	-1.0%			

=COUNTIF(\$Q\$4:\$Q\$1010, S12)

Bin	Frequency
-15%	0
-14%	0
-13%	1
-12%	0
-11%	0
-10%	0
-9%	1
-8%	2
-7%	1
-6%	6
-5%	12
-4%	28
-3%	48
-2%	88
-1%	156
0%	276
1%	200
2%	119
3%	36
4%	17

Create bins (range with 1% change) and calculate number of returns that fall within those bins.

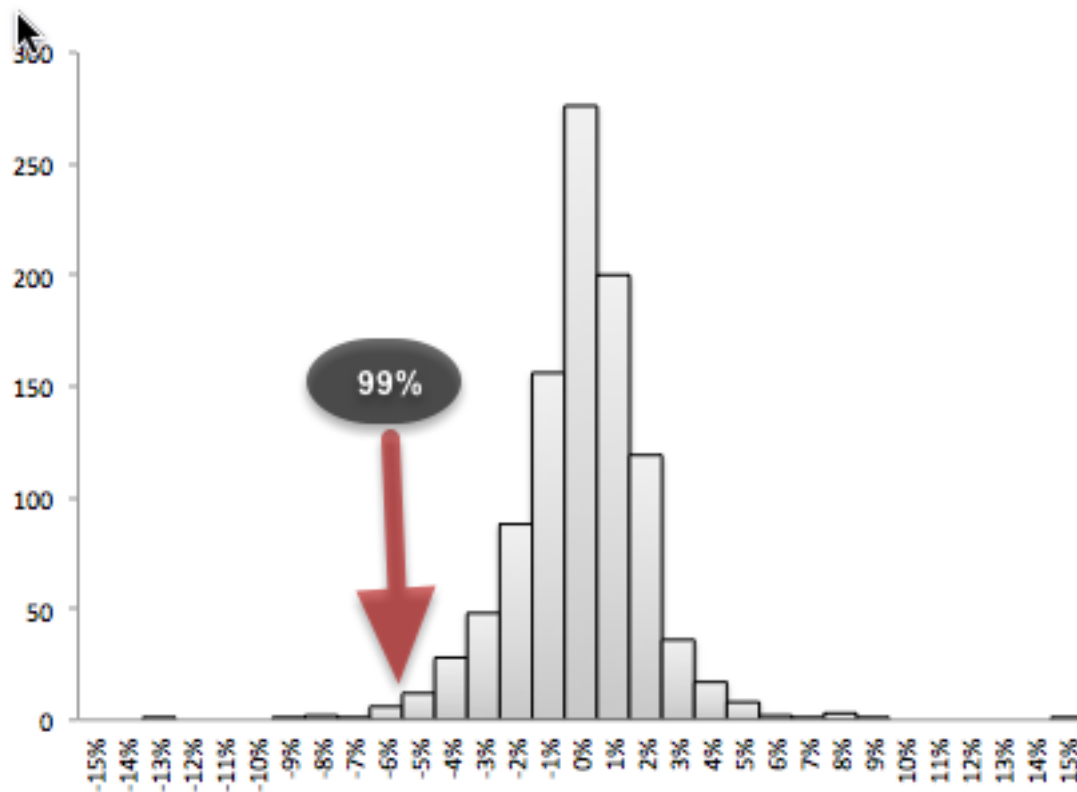
For example,

Our range falls between -15% and 15% with 1% value step.

Frequency (how many times each return is observed) can be calculated using Excel formula COUNTIF(range,bin).

i.e., COUNTIF(\$Q\$4:\$Q\$1010, S12)

### Step 13: Create Histogram



Using data from Step 12, create Histogram (Charts -> Column).

Returns are located on axis X, and Frequency - on axis Y.

### Step 14: Calculate Value at Risk

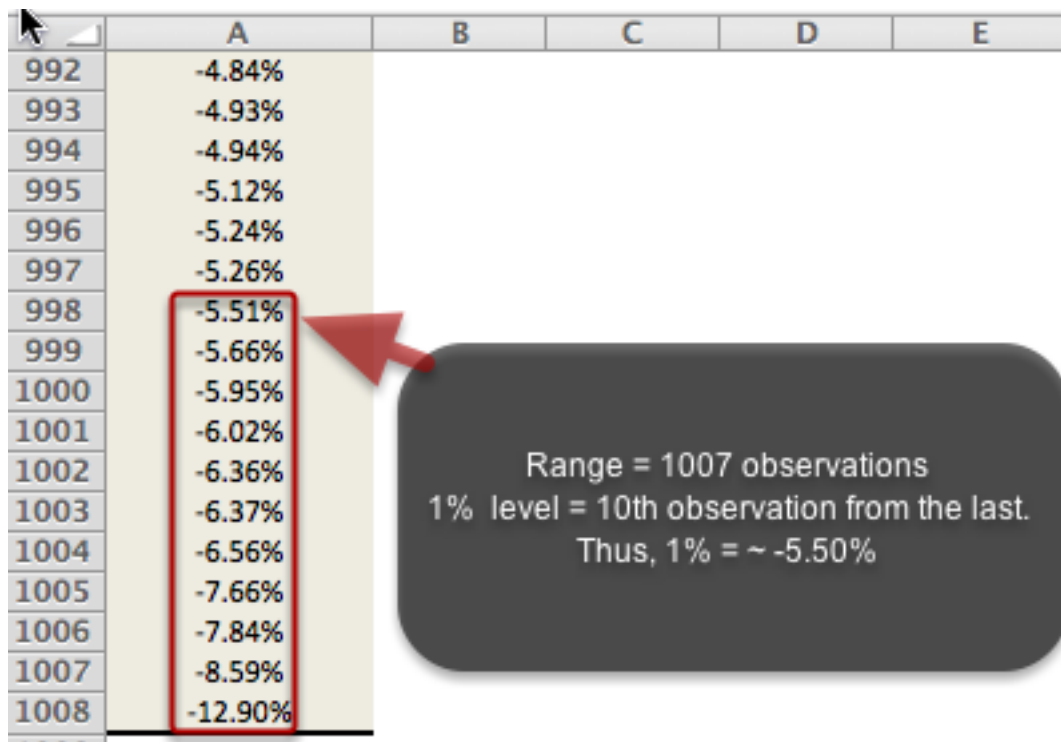
	RM	Returns
Mean	-9.89	-0.003%
St.Deviation	6,221.24	2.074%
Confidence level	99%	99%

**VaR -16,492.24 -5.50%**

Calculate VaR using Excel formula PERCENTILE.

Here, to calculate VaR with 99% of confidence level, we are using the following formula:  
=PERCENTILE(RETURNS RANGE, 1%)

### Step 15: Double check of the previous value



	A	B	C	D	E
992	-4.84%				
993	-4.93%				
994	-4.94%				
995	-5.12%				
996	-5.24%				
997	-5.26%				
998	-5.51%				
999	-5.66%				
1000	-5.95%				
1001	-6.02%				
1002	-6.36%				
1003	-6.37%				
1004	-6.56%				
1005	-7.66%				
1006	-7.84%				
1007	-8.59%				
1008	-12.90%				

Range = 1007 observations  
1% level = 10th observation from the last.  
Thus, 1% = ~ -5.50%

Arrange (sort) returns from best to worst, i.e. from highest positive to lowest negative, and pick 10th value from the end ( $1007 - 10 = 997$ ), which is 1 percentile of 1007 returns data = ~ -5.50%

Finally, VaR is 5.50% out of RM300,000 = -16,492.24 ringgits @ 99% confidence level.

**GOOD LUCK!**

Was-salamu 'aleykum wa rahmatullah!