Background:

STEP 1: DATA COLLECTION

Choose 3 lists of 36 stocks on the TSX from
http://clouddc.chass.utoronto.ca.ezproxy.library.yorku.ca/ds/cfmrc/

Pick 36 stocks based on My name- YA JUN BAI

• 36 stocks whose symbols begin with **Y or A (call this the 1st group)**
• 36 stocks whose symbols begin with **J or U (call this the 2nd group)**
• 36 stocks whose symbols begin with **B or A (call this the 3rd group)**
and get an end of day price for ALL of them on the *same* date (April 6).

RULE:
ONLY CHOOSE STOCKS that have both **2015 & 2016** prices.

Try to get a range of prices. This improves the "appearance" of the distribution. Do not use stocks that have a negative price or a zero price in either year (so you may need to initially select more than your total of 108 stocks because some might need to be rejected if they have zero or negative prices – you need to end up with 108 stocks with non-zero and non-negative prices). Get an end of day price for approximately 1 year later in 2016 (± 1-5 days) FOR YOUR FIRST & SECOND BASKETS of stocks.

STEP 2: ANALYSIS

[1] ***Descriptive numerical characteristics of each basket by using ANALYZE / DESCRIPTIVE STATISTICS /EXPLORE in SPSS***

Task1

1st: Group1-2015

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
StockPrice	36	100.0%	0	0.0%	36	100.0%

Descriptives

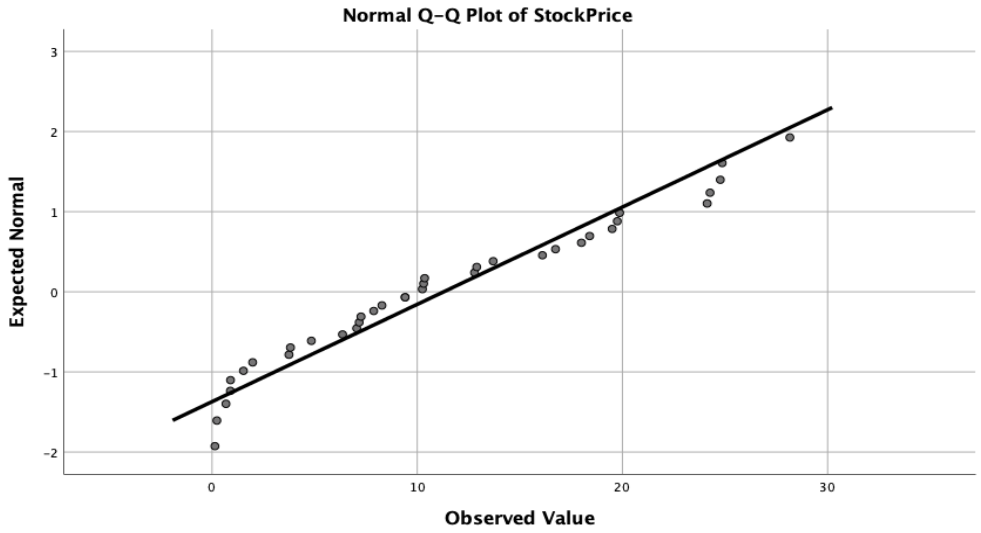
			Statistic	Std. Error
StockPrice	Mean		$11.2899	$1.37230
	95% Confidence Interval for Mean	Lower Bound	$8.5039	
		Upper Bound	$14.0758	
	5% Trimmed Mean		$11.0512	
	Median		$9.8300	
	Variance		67.796	
	Std. Deviation		$8.23382	
	Minimum		$0.14	
	Maximum		$28.16	
	Range		$28.02	
	Interquartile Range		$14.22	
	Skewness		.399	.393
	Kurtosis		-.933	.768

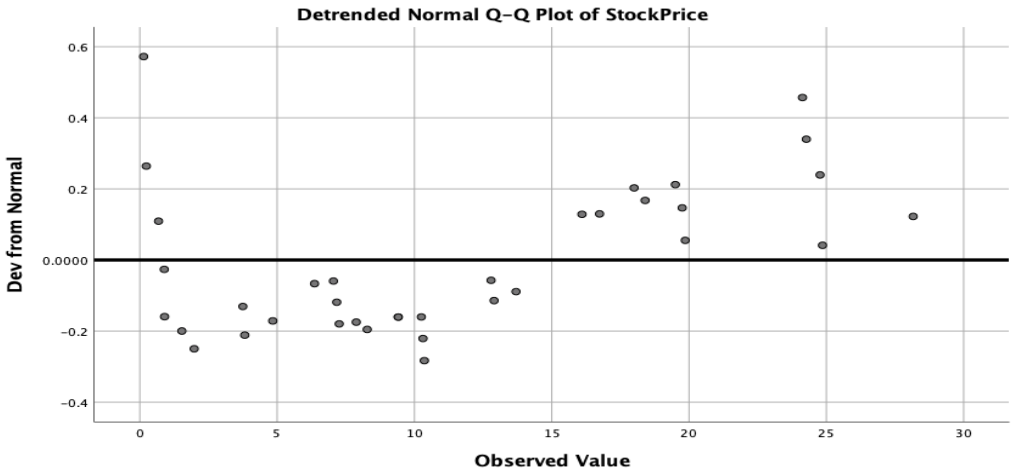
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
StockPrice	.128	36	.142	.939	36	.047

a. Lilliefors Significance Correction

Stock Price


Normal Q-Q Plot of StockPrice
Expected Normal
Observed Value
3
2
1
0
-1
-2
0
10
20
30


Detrended Normal Q-Q Plot of StockPrice
Dev from Normal
Observed Value
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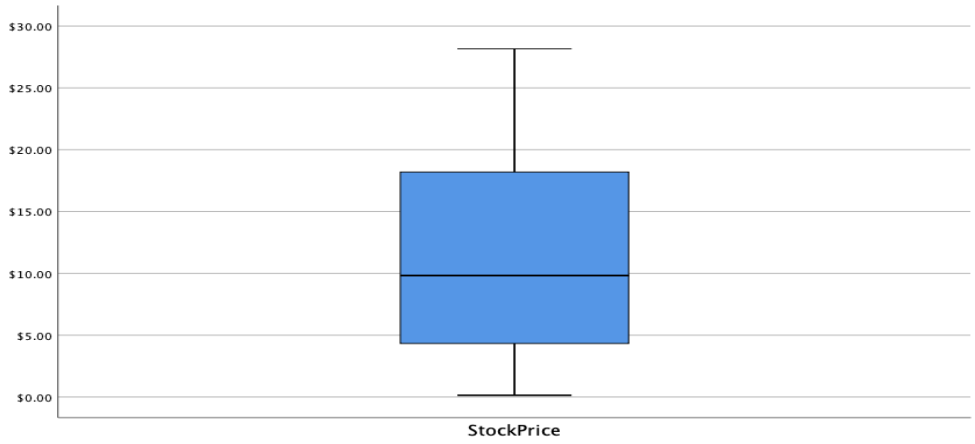
0.4
0.2
0.0000
-0.2
-0.4
0
5
10
15
20
25
30


$30.00
$25.00
$20.00
$15.00
$10.00
$5.00
$0.00
StockPrice

1st: Group1-2015

Date	Company	Type	StockPrice
2015-04-06 00:00	YGR	0	$1.53
2015-04-06 00:00	YRI	1	$4.84
2015-04-06 00:00	YP.UN	0	$7.05
2015-04-06 00:00	Y.WT	0	$3.75
2015-04-06 00:00	ACR.UN	0	$9.41
2015-04-06 00:00	AAV	0	$7.17
2015-04-06 00:00	AAB	0	$0.14
2015-04-06 00:00	ABT	0	$10.31
2015-04-06 00:00	ACR.UN	0	$9.41
2015-04-06 00:00	ADN	1	$18.00
2015-04-06 00:00	ADW.A	1	$16.10
2015-04-06 00:00	AEI	0	$3.82
2015-04-06 00:00	AEU.UN	0	$6.36
2015-04-06 00:00	AEZS	0	$0.68
2015-04-06 00:00	AF	0	$10.36
2015-04-06 00:00	AGF.B	1	$8.28
2015-04-06 00:00	AGI	1	$7.26
2015-04-06 00:00	AGI.WT	0	$0.24
2015-04-06 00:00	AGT	2	$28.16
2015-04-06 00:00	AHF	0	$0.89
2015-04-06 00:00	AHY.UN	0	$7.88
2015-04-06 00:00	AI	0	$12.79
2015-04-06 00:00	AIF	0	$19.86
2015-04-06 00:00	AIM	1	$13.70
2015-04-06 00:00	AIM.PR.A	0	$19.50
2015-04-06 00:00	AIM.PR.C	1	$24.77
2015-04-06 00:00	AKG	0	$1.98
2015-04-06 00:00	AKT.A	1	$10.25
2015-04-06 00:00	ALA.PR.A	0	$19.75
2015-04-06 00:00	ALA.PR.E	0	$24.86
2015-04-06 00:00	ALA.PR.G	0	$24.13
2015-04-06 00:00	ALA.PR.U	0	$24.27
2015-04-06 00:00	ALB	0	$18.40
2015-04-06 00:00	ALC	0	$16.74
2015-04-06 00:00	ALO	0	$0.90
2015-04-06 00:00	ALS	0	$12.90

2nd: Group1-2016

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Stockprice	36	100.0%	0	0.0%	36	100.0%

Descriptives

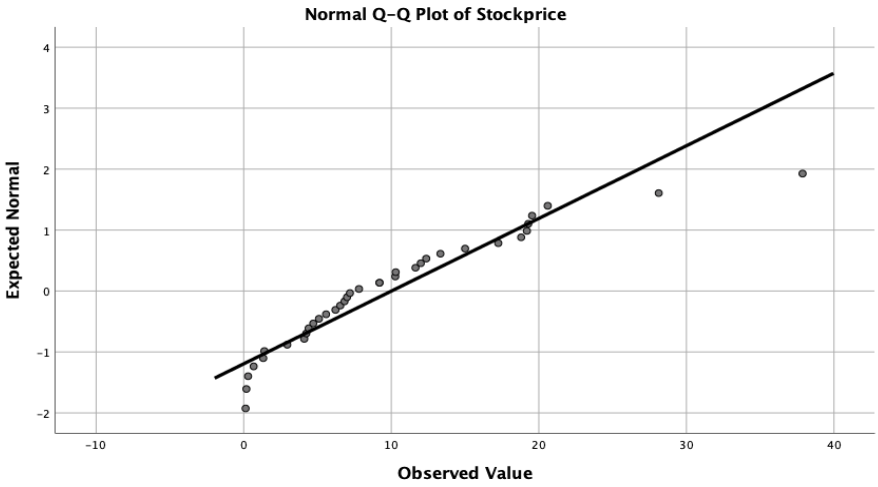
			Statistic	Std. Error
Stockprice	Mean		$10.0176	$1.39778
	95% Confidence Interval for Mean	Lower Bound	$7.1800	
		Upper Bound	$12.8553	
	5% Trimmed Mean		$9.2591	
	Median		$7.5050	
	Variance		70.336	
	Std. Deviation		$8.38666	
	Minimum		$0.13	
	Maximum		$37.87	
	Range		$37.74	
	Interquartile Range		$10.30	
	Skewness		1.332	.393
	Kurtosis		2.270	.768

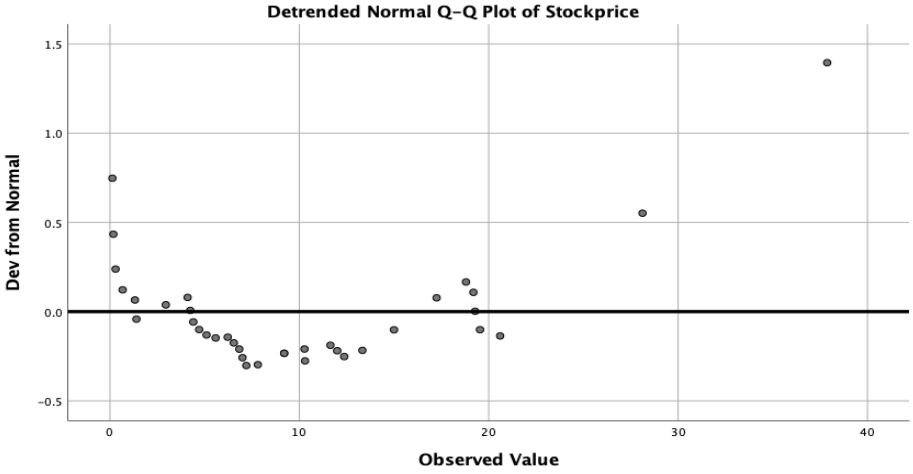
Tests of Normality

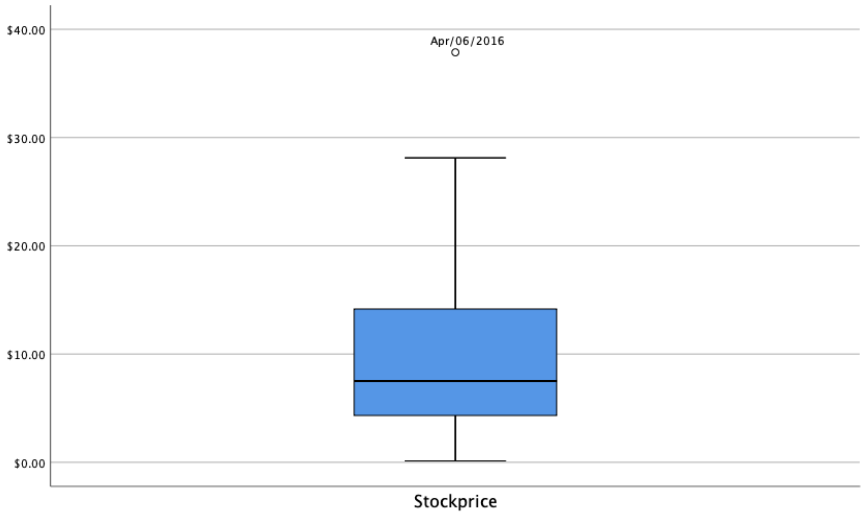
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Stockprice	.132	36	.118	.893	36	.002

a. Lilliefors Significance Correction

Stock price







2nd: Group1-2016

Date	Company	Type	Stockprice
06-Apr-16	YGR	0	$0.67
06-Apr-16	YRI	1	$4.10
06-Apr-16	YP.UN	0	$5.58
06-Apr-16	Y.WT	0	$4.40
06-Apr-16	ACR.UN	0	$9.20
06-Apr-16	AAV	0	$6.83
06-Apr-16	AAB	0	$0.13
06-Apr-16	ABT	0	$6.22
06-Apr-16	ACR.UN	0	$9.20
06-Apr-16	ADN	1	$19.28
06-Apr-16	ADW.A	1	$28.12
06-Apr-16	AEI	0	$1.40
06-Apr-16	AEU.UN	0	$4.24
06-Apr-16	AEZS	0	$4.71
06-Apr-16	AF	0	$10.30
06-Apr-16	AGF.B	1	$5.10
06-Apr-16	AGI	1	$7.20
06-Apr-16	AGI.WT.A	0	$1.32
06-Apr-16	AGT	2	$37.87
06-Apr-16	AHF	0	$0.18
06-Apr-16	AHY.UN	0	$6.54
06-Apr-16	AI	0	$11.64
06-Apr-16	AIF	0	$20.60
06-Apr-16	AIM	1	$7.81
06-Apr-16	AIM.PR.A	0	$10.27
06-Apr-16	AIM.PR.C	1	$13.33
06-Apr-16	AKG	0	$2.95
06-Apr-16	AKT.A	1	$7.00
06-Apr-16	ALA.PR.A	0	$15.00
06-Apr-16	ALA.PR.E	0	$19.54
06-Apr-16	ALA.PR.G	0	$19.19
06-Apr-16	ALA.PR.U	0	$18.80
06-Apr-16	ALB	0	$17.25
06-Apr-16	ALC	0	$12.37
06-Apr-16	ALO	0	$0.30
06-Apr-16	ALS	0	$12.00

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Price	36	100.0%	0	0.0%	36	100.0%

Descriptives

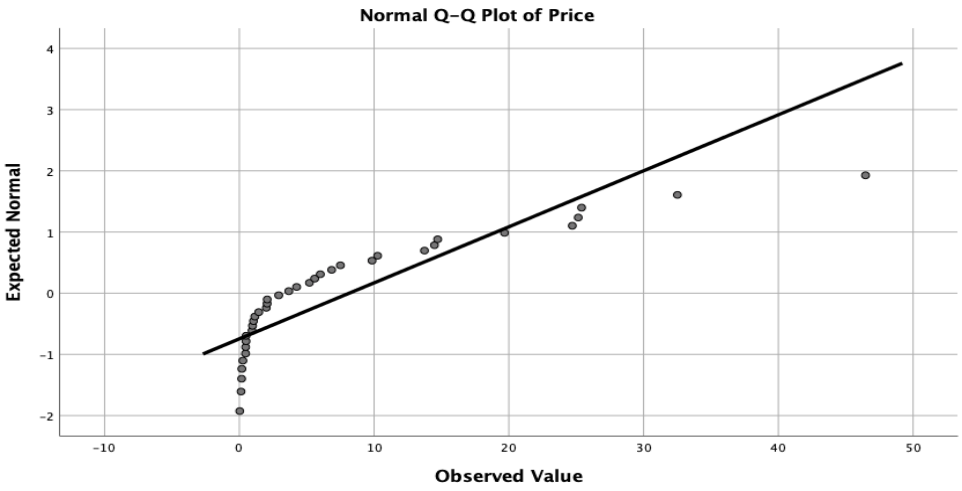
			Statistic	Std. Error
Price	Mean		$8.1486	$1.82064
	95% Confidence Interval for Mean	Lower Bound	$4.4525	
		Upper Bound	$11.8447	
	5% Trimmed Mean		$6.8130	
	Median		$3.2950	
	Variance		119.330	
	Std. Deviation		$10.92383	
	Minimum		$0.03	
	Maximum		$46.47	
	Range		$46.44	
	Interquartile Range		$12.26	
	Skewness		1.867	.393
	Kurtosis		3.467	.768

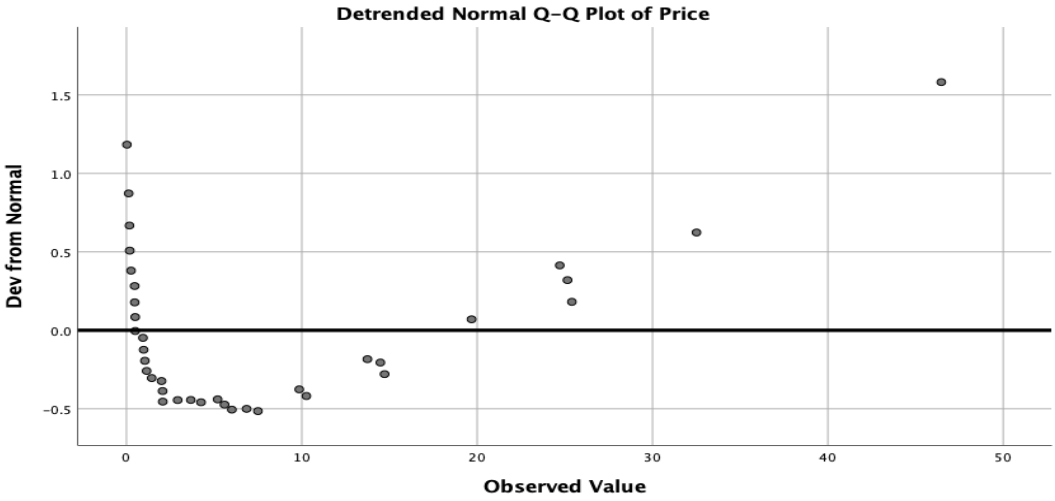
Tests of Normality

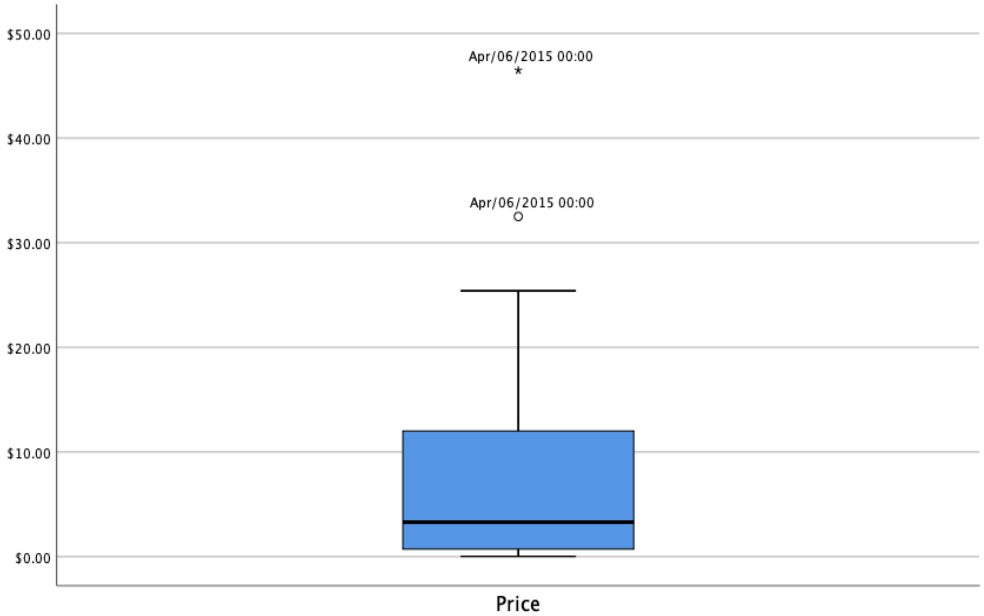
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Price	.229	36	.000	.748	36	.000

a. Lilliefors Significance Correction

Stock Price


Normal Q-Q Plot of Price
Expected Normal
Observed Value
4
3
2
1
0
-1
-2
-10
0
10
20
30
40
50


Detrended Normal Q-Q Plot of Price
Dev from Normal
Observed Value
1.5
1.0
0.5
0.0
-0.5
0
10
20
30
40
50


$50.00
$40.00
$30.00
$20.00
$10.00
$0.00
Apr/06/2015 00:00
Apr/06/2015 00:00
Price

3rd: Group2-2015

Date	Company	Type	Price
2015-04-06 0:00	JE	0	$6.01
2015-04-06 0:00	JFS.UN	0	$13.74
2015-04-06 0:00	JOY	0	$5.20
2015-04-06 0:00	U	2	$5.59
2015-04-06 0:00	UEX	0	$0.26
2015-04-06 0:00	UR	0	$2.07
2015-04-06 0:00	URB.A	0	$2.00
2015-04-06 0:00	URE	0	$1.15
2015-04-06 0:00	US	0	$9.85
2015-04-06 0:00	USH.UN	0	$10.26
2015-04-06 0:00	UWE	0	$0.03
2015-04-06 0:00	NAL	1	$14.72
2015-04-06 0:00	NA.PR.Q	0	$25.40
2015-04-06 0:00	NA.PR.S	0	$25.15
2015-04-06 0:00	NA.PR.W	0	$24.71
2015-04-06 0:00	NB	1	$1.44
2015-04-06 0:00	NCF	0	$0.17
2015-04-06 0:00	NCP	0	$0.47
2015-04-06 0:00	NCU	0	$0.98
2015-04-06 0:00	NDM	0	$0.50
2015-04-06 0:00	NDQ	0	$19.68
2015-04-06 0:00	NEPT	0	$2.06
2015-04-06 0:00	NEW.PR.D	0	$32.51
2015-04-06 0:00	NEXT	0	$0.13
2015-04-06 0:00	NFI	0	$14.48
2015-04-06 0:00	NG	1	$4.25
2015-04-06 0:00	NGD.WT.A	0	$0.50
2015-04-06 0:00	NGQ	0	$0.94
2015-04-06 0:00	NHC	1	$7.50
2015-04-06 0:00	NIF.UN	0	$2.92
2015-04-06 0:00	NII	0	$6.85
2015-04-06 0:00	NKO	0	$0.47
2015-04-06 0:00	NLN	0	$1.05
2015-04-06 0:00	NML	0	$0.19
2015-04-06 0:00	NOA	2.55	$3.67
2015-04-06 0:00	NA	0	$46.47

4th: Group2-2016

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Price	36	100.0%	0	0.0%	36	100.0%

Descriptives

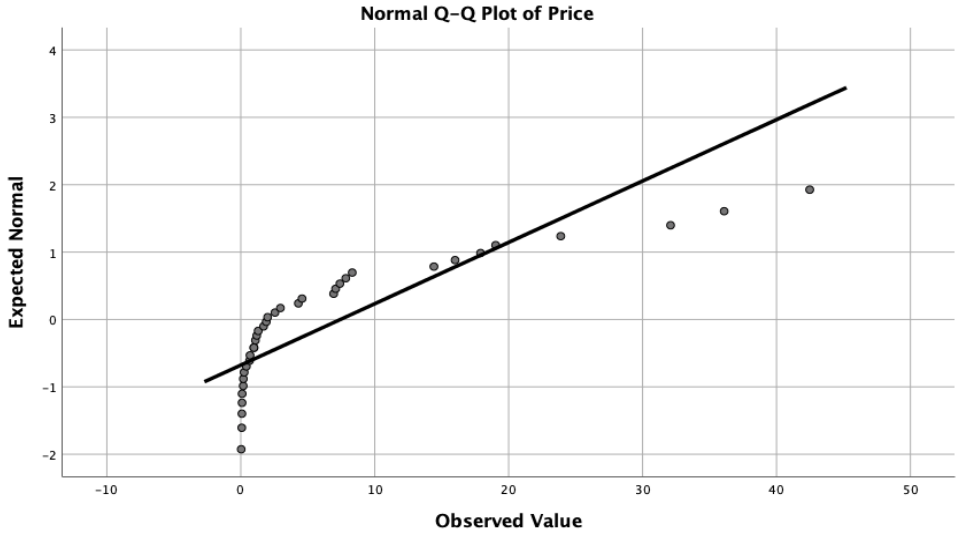
			Statistic	Std. Error
Price	Mean		$7.43694	$1.829892
	95% Confidence Interval for Mean	Lower Bound	$3.72207	
		Upper Bound	$11.15182	
	5% Trimmed Mean		$6.05840	
	Median		$1.95000	
	Variance		120.546	
	Std. Deviation		$10.979350	
	Minimum		$0.030	
	Maximum		$42.480	
	Range		$42.450	
	Interquartile Range		$7.730	
	Skewness		1.909	.393
	Kurtosis		3.037	.768

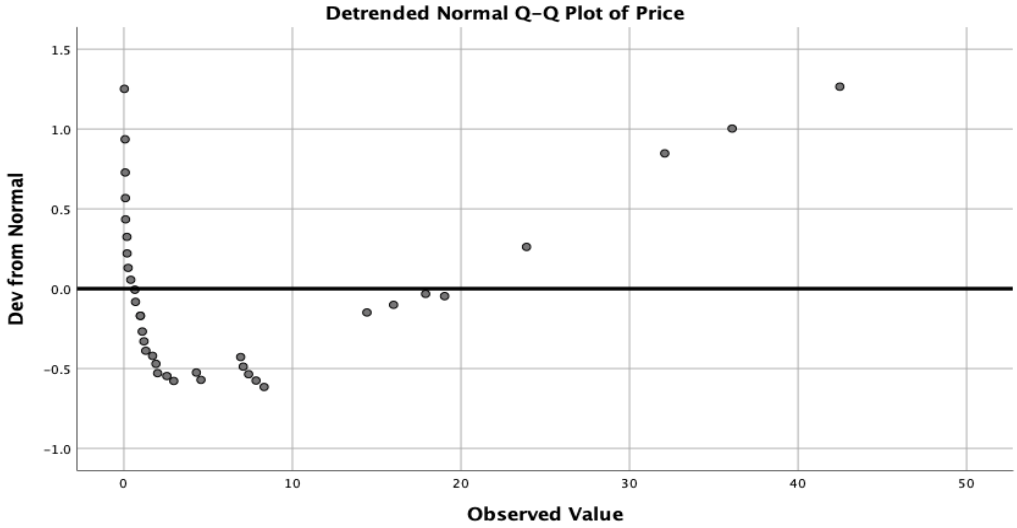
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Price	.250	36	.000	.704	36	.000

a. Lilliefors Significance Correction

Price


Normal Q-Q Plot of Price
Expected Normal
Observed Value
4
3
2
1
0
-1
-2
-10
0
10
20
30
40
50


Detrended Normal Q-Q Plot of Price
Dev from Normal
Observed Value
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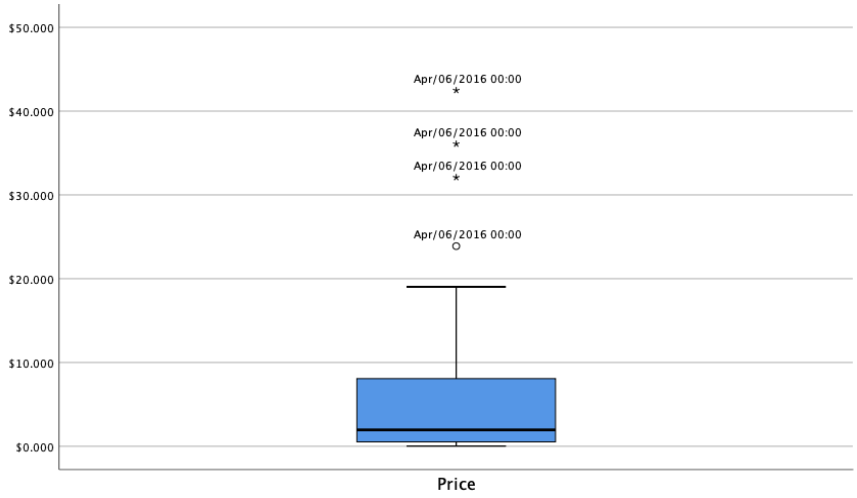
1.0
0.5
0.0
-0.5
-1.0
0
10
20
30
40
50


$50.000
$40.000
$30.000
$20.000
$10.000
$0.000
Apr/06/2016 00:00
Apr/06/2016 00:00
Apr/06/2016 00:00
Apr/06/2016 00:00
Price

4th: Group2-2016

Date	Company	Type	Price
2016-04-06 0:00	JE	0	$7.84
2016-04-06 0:00	JFS.UN	0	$14.42
2016-04-06 0:00	JOY	0	$2.00
2016-04-06 0:00	U	2	$4.57
2016-04-06 0:00	UEX	0	$0.18
2016-04-06 0:00	UR	0	$1.19
2016-04-06 0:00	URB.A	0	$1.90
2016-04-06 0:00	URE	0	$0.65
2016-04-06 0:00	US	0	$8.32
2016-04-06 0:00	USF.UN	0	$7.40
2016-04-06 0:00	UWE	0	$0.03
2016-04-06 0:00	NAL	1	$1.70
2016-04-06 0:00	NA.PR.Q	0	$23.89
2016-04-06 0:00	NA.PR.S	0	$19.03
2016-04-06 0:00	NA.PR.W	0	$17.90
2016-04-06 0:00	NB	1	$0.98
2016-04-06 0:00	NCF	0	$0.09
2016-04-06 0:00	NCP	0	$0.25
2016-04-06 0:00	NCU	0	$0.98
2016-04-06 0:00	NDM	0	$0.41
2016-04-06 0:00	NDQ	0	$16.00
2016-04-06 0:00	NEPT	0	$1.30
2016-04-06 0:00	NEW.PR.D	0	$32.09
2016-04-06 0:00	NEXT	0	$0.08
2016-04-06 0:00	NFI	0	$36.09
2016-04-06 0:00	NG	1	$6.93
2016-04-06 0:00	NGD.WT.A	0	$0.07
2016-04-06 0:00	NGQ	0	$0.69
2016-04-06 0:00	NHC	1	$4.30
2016-04-06 0:00	NIF.UN	0	$2.96
2016-04-06 0:00	NII	0	$7.08
2016-04-06 0:00	NKO	0	$0.19
2016-04-06 0:00	NLN	0	$1.09
2016-04-06 0:00	NML	0	$0.10
2016-04-06 0:00	NOA	0	$2.55
2016-04-06 0:00	NA	0	$42.48

5th: Group3-2015

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Price	36	100.0%	0	0.0%	36	100.0%

Descriptives

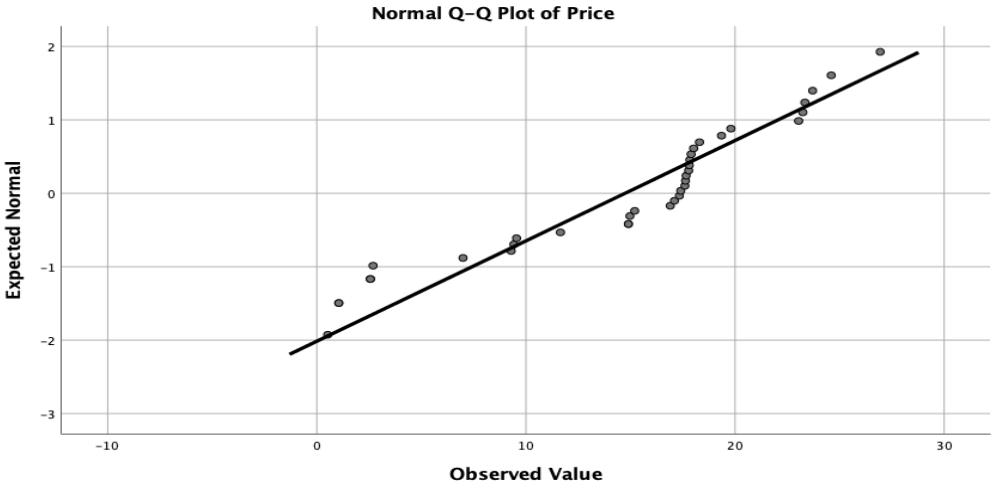
			Statistic	Std. Error
Price	Mean		$14.73889	$1.219262
	95% Confidence Interval for Mean	Lower Bound	$12.26366	
		Upper Bound	$17.21412	
	5% Trimmed Mean		$14.89568	
	Median		$17.37000	
	Variance		53.518	
	Std. Deviation		$7.315569	
	Minimum		$0.520	
	Maximum		$26.940	
	Range		$26.420	
	Interquartile Range		$8.778	
	Skewness		-.652	.393
	Kurtosis		-.458	.768

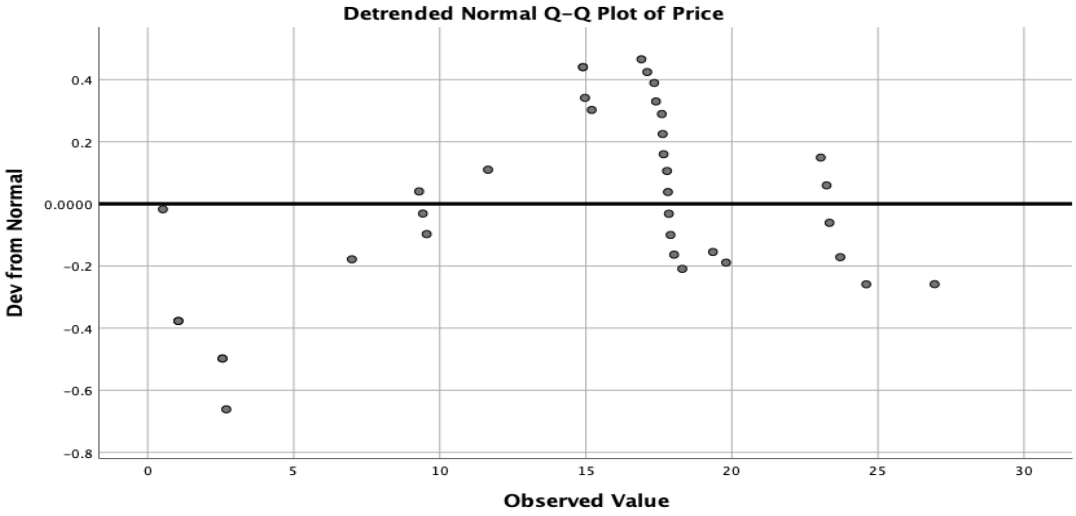
Tests of Normality

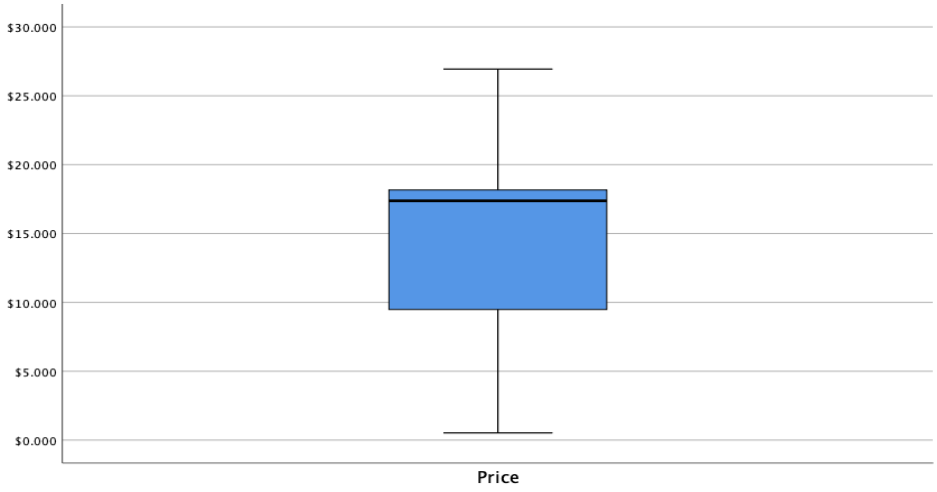
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Price	.203	36	.001	.903	36	.004

a. Lilliefors Significance Correction

Stock Price


Normal Q–Q Plot of Price
Expected Normal
Observed Value
2
1
0
−1
−2
−3
−10
0
10
20
30


Detrended Normal Q–Q Plot of Price
Dev from Normal
Observed Value
0.4
0.2
0.0000
−0.2
−0.4
−0.6
−0.8
0
5
10
15
20
25
30


$30.000
$25.000
$20.000
$15.000
$10.000
$5.000
$0.000
Price

5th: Group3-2015

Date	Company	Type	Price
2015-04-06 0:00	BAD	2	$26.94
2015-04-06 0:00	BAM.PR.K	0	$14.90
2015-04-06 0:00	BAR	0	$1.05
2015-04-06 0:00	BBD.B	1	$2.56
2015-04-06 0:00	BBD.B	1	$2.56
2015-04-06 0:00	BAM.PF.A	0	$24.60
2015-04-06 0:00	BAM.PF.B	0	$23.04
2015-04-06 0:00	BAM.PF.C	0	$23.34
2015-04-06 0:00	BAM.PF.D	0	$23.71
2015-04-06 0:00	BAM.PR.B	0	$15.20
2015-04-06 0:00	BAM.PR.C	0	$14.97
2015-04-06 0:00	BAM.PR.G	0	$19.80
2015-04-06 0:00	BAM.PR.K	0	$14.90
2015-04-06 0:00	BAM.PR.X	0	$17.10
2015-04-06 0:00	BBD.PR.C	0	$19.35
2015-04-06 0:00	BB	0	$11.65
2015-04-06 0:00	BBD.PR.D	0	$9.42
2015-04-06 0:00	BCE.PR.A	0	$17.66
2015-04-06 0:00	BCE.PR.C	0	$17.63
2015-04-06 0:00	BCE.PR.D	0	$17.60
2015-04-06 0:00	BCE.PR.E	0	$17.90
2015-04-06 0:00	BCE.PR.F	0	$16.90
2015-04-06 0:00	BCE.PR.G	0	$17.81
2015-04-06 0:00	BCE.PR.H	0	$17.78
2015-04-06 0:00	BCE.PR.I	0	$17.34
2015-04-06 0:00	BCE.PR.J	0	$18.02
2015-04-06 0:00	BCE.PR.K	0	$17.40
2015-04-06 0:00	BCE.PR.M	1	$18.30
2015-04-06 0:00	BCE.PR.S	0	$17.84
2015-04-06 0:00	BGI.UN	0	$9.29
2015-04-06 0:00	BHY.UN	0	$9.55
2015-04-06 0:00	BIR	0	$6.99
2015-04-06 0:00	BKX	0	$0.52
2015-04-06 0:00	BLDP	0	$2.69
2015-04-06 0:00	BLU	0	$1.05
2015-04-06 0:00	BPO.PR.T	0	$23.24

6th: Group3-2016

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Price	36	100.0%	0	0.0%	36	100.0%

Descriptives

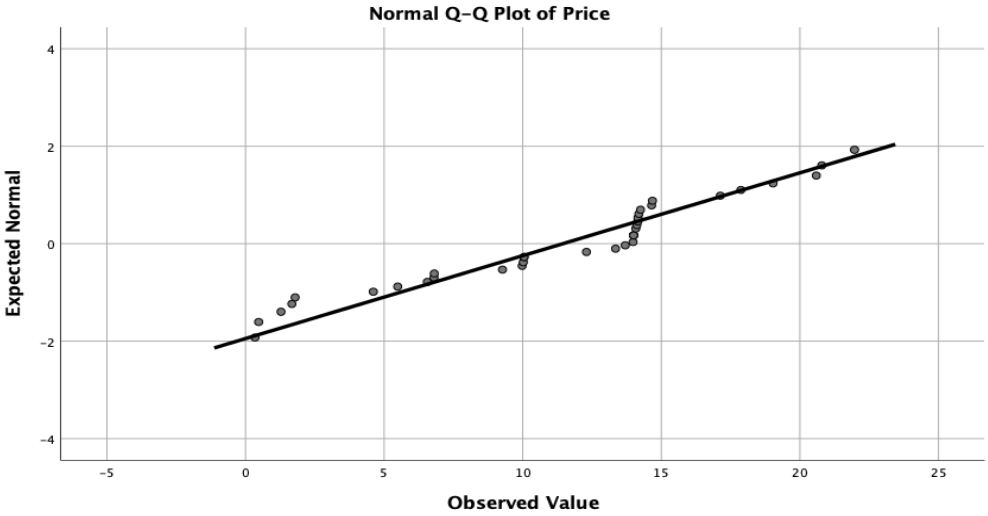
			Statistic	Std. Error
Price	Mean		11.4496	.98033
	95% Confidence Interval for Mean	Lower Bound	9.4594	
		Upper Bound	13.4398	
	5% Trimmed Mean		11.5081	
	Median		13.8400	
	Variance		34.597	
	Std. Deviation		5.88196	
	Minimum		.34	
	Maximum		21.97	
	Range		21.63	
	Interquartile Range		7.43	
	Skewness		-.380	.393
	Kurtosis		-.529	.768

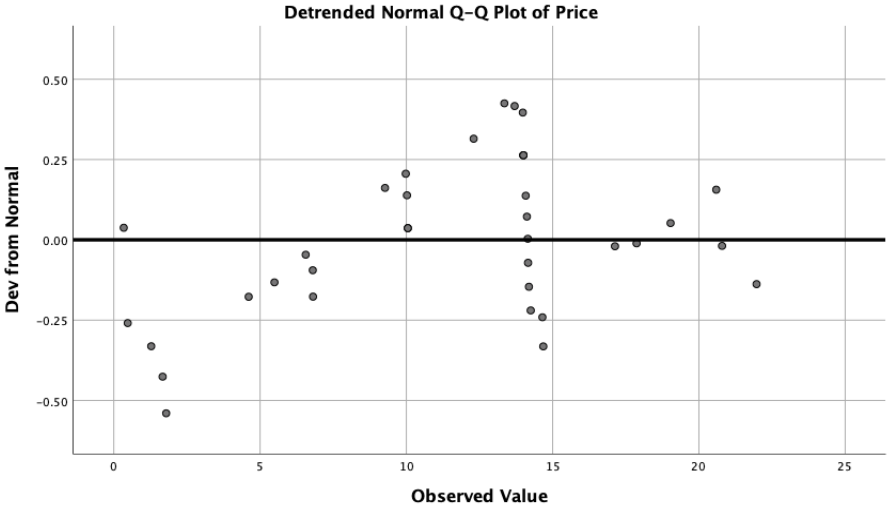
Tests of Normality

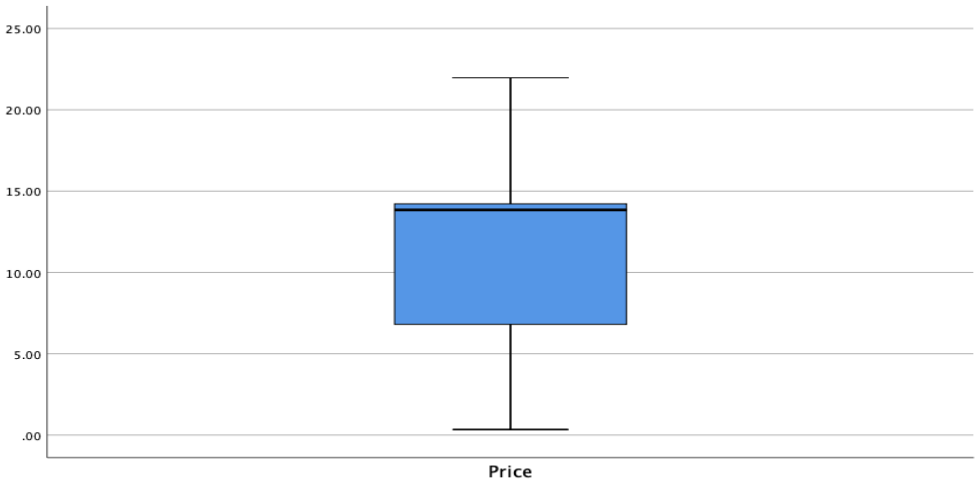
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Price	.182	36	.004	.935	36	.036

a. Lilliefors Significance Correction

Price


Normal Q-Q Plot of Price
Expected Normal
Observed Value
4
2
0
-2
-4
-5
0
5
10
15
20
25


Detrended Normal Q-Q Plot of Price
Dev from Normal
Observed Value
0.50
0.25
0.00
-0.25
-0.50
0
5
10
15
20
25


25.00
20.00
15.00
10.00
5.00
.00
Price

6th: Group3-2016

Date	Company	Type	Price
2016-04-06 0:00	BAD	2	21.97
2016-04-06 0:00	BAM.PR.K	0	10.05
2016-04-06 0:00	BAR	0	0.48
2016-04-06 0:00	BBD.B	1	1.28
2016-04-06 0:00	BBD.PR.B	0	6.56
2016-04-06 0:00	BAM.PF.A	0	19.03
2016-04-06 0:00	BAM.PF.B	0	17.87
2016-04-06 0:00	BAM.PF.C	0	20.59
2016-04-06 0:00	BAM.PF.D	0	20.79
2016-04-06 0:00	BAM.PR.B	0	10.02
2016-04-06 0:00	BAM.PR.C	0	9.98
2016-04-06 0:00	BAM.PR.G	0	14.00
2016-04-06 0:00	BAM.PR.K	0	10.05
2016-04-06 0:00	BAM.PR.X	0	14.68
2016-04-06 0:00	BBD.PR.C	0	12.30
2016-04-06 0:00	BB	0	9.27
2016-04-06 0:00	BBD.PR.D	0	6.81
2016-04-06 0:00	BCE.PR.A	0	14.00
2016-04-06 0:00	BCE.PR.C	0	14.65
2016-04-06 0:00	BCE.PR.D	0	14.19
2016-04-06 0:00	BCE.PR.E	0	14.12
2016-04-06 0:00	BCE.PR.F	0	14.00
2016-04-06 0:00	BCE.PR.G	0	14.15
2016-04-06 0:00	BCE.PR.H	0	14.25
2016-04-06 0:00	BCE.PR.I	0	13.70
2016-04-06 0:00	BCE.PR.J	0	14.08
2016-04-06 0:00	BCE.PR.K	0	13.35
2016-04-06 0:00	BCE.PR.M	1	13.98
2016-04-06 0:00	BCE.PR.S	0	14.16
2016-04-06 0:00	BGI.UN	0	5.49
2016-04-06 0:00	BHY.UN	0	6.80
2016-04-06 0:00	BIR	0	4.61
2016-04-06 0:00	BKX	0	0.34
2016-04-06 0:00	BLDP	0	1.79
2016-04-06 0:00	BLU	0	1.67
2016-04-06 0:00	BPO.PR.T	0	17.13

Task2

Introduction (comparing two means):

We are performing Two-Sample T-Test in SPSS.
Two-Sample T-Test is also known as independent T-Test or between-subjects T-test. We perform this test when we want to compare the mean of two different samples.
By running **Analyze/CompareMeans/ Independent-Samples T-Test**, we can decide if there is a significant difference in the mean value of the sets of stocks between two group1 and group2 in 2015, at the $\alpha = 0.05$ level of significance.

Assumption:

- Dependent variable measured on a continuous scale
  -All stock price measured using by dollars
- The independent variable consists of two categorical, independent groups
  -Date and stock price are independent
- Independence of observations
  -There is no relationship between dates and stock price
- No significant outliers
  -We can check Group1-2015 and Group2-2015 output information

Hypothesis:

H_0: $u_{1\text{-}2015} = u_{2\text{-}2015}$

H_1: $u_{1\text{-}2015} \neq u_{2\text{-}2015}$

Conclusion:

P-value = 0.173

P-value > 0.05 which means the test fails to reject H_0.

There is no evidence of difference in the mean between Group1 and Group2 in 2015 at 5% significance level based on the observation, we are not sure whether actual difference exists or not.

Means between Group1 and Group2 in 2015

T-TEST GROUPS = Group (1 2)

T-Test

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Price	1	36	$11.2900	$8.23363	$1.37227
	2	36	$8.1492	$10.92342	$1.82057

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Price	Equal variances assumed	.834	.364	1.378	70	.173	$3.14083	$2.27983	-$1.40613	$7.68780
	Equal variances not assumed			1.378	65.066	.173	$3.14083	$2.27983	-$1.41221	$7.69387

Means between Group1 and Group2 in 2015

Price	Group
$1.53	1
$4.84	1
$7.05	1
$3.75	1
$9.41	1
$7.17	1
$0.14	1
$10.31	1
$9.41	1
$18.00	1
$16.10	1
$3.82	1
$6.36	1
$0.68	1
$10.36	1
$8.28	1
$7.26	1
$0.24	1
$28.16	1
$0.89	1
$7.88	1
$12.79	1
$19.86	1
$13.70	1
$19.50	1
$24.77	1
$1.98	1
$10.25	1
$19.75	1
$24.86	1
$24.13	1
$24.27	1
$18.40	1
$16.74	1
$0.90	1
$12.90	1
$6.01	2
$13.74	2
$5.20	2
$5.59	2
$0.26	2
$2.07	2
$2.00	2
$1.15	2
$9.85	2
$10.26	2
$0.03	2
$14.72	2
$25.40	2
$25.15	2
$24.71	2
$1.44	2
$0.17	2
$0.47	2
$0.98	2
$0.50	2
$19.68	2
$2.06	2
$32.51	2
$0.13	2
$14.48	2
$4.25	2
$0.50	2
$0.94	2
$7.50	2
$2.92	2
$6.85	2
$0.47	2
$1.05	2
$0.19	2
$3.67	2
$46.47	2

Task3

Introduction (comparing 3 means):

Performing one-way ANOVA in SPSS.

ANOVA stands for Analysis Of VAriance. We run ANOVA when we want to compare the mean scores of three or more groups.

By running **Analyze/General Linear Model/Univariate** in SPSS to analyze if there is a significant difference in the mean value of the sets of stocks in each of the three groups in 2015, at the $\alpha = 0.05$ level of significance.

Assumption:

- Dependent variable measured on a continuous scale

  -All stock price measured using by dollars

- The independent variable consists of two categorical, independent groups

  -Date and stock price are independent

- Independence of observations

  -There is no relationship between dates and stock price

Hypothesis:

H_0: $u_{1\text{-}2015} = u_{2\text{-}2015} = u_{3\text{-}2015}$

H_1: Not all means in the 3 groups are equal

Conclusion:

P-value = 0.001

P-value < 0.05 which means the test reject H_0.

Price of Group1, Group2 and Group3 in 2015

```
UNIANOVA Price BY Group
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /CRITERIA=ALPHA(0.05)
  /DESIGN=Group.
```

Univariate Analysis of Variance

Between-Subjects Factors

		N
Group	1	36
	2	36
	3	36

Tests of Between-Subjects Effects

Dependent Variable: Price

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1074.990[a]	2	537.495	8.164	.001
Intercept	13110.935	1	13110.935	199.147	.000
Group	1074.990	2	537.495	8.164	.001
Error	6912.712	105	65.835		
Total	21098.637	108			
Corrected Total	7987.702	107			

a. R Squared = .135 (Adjusted R Squared = .118)

Price of Group1, Group2 and Group3 in 2015

Price	Group
$1.53	1
$4.84	1
$7.05	1
$3.75	1
$9.41	1
$7.17	1
$0.14	1
$10.31	1
$9.41	1
$18.00	1
$16.10	1
$3.82	1
$6.36	1
$0.68	1
$10.36	1
$8.28	1
$7.26	1
$0.24	1
$28.16	1
$0.89	1
$7.88	1
$12.79	1
$19.86	1
$13.70	1
$19.50	1
$24.77	1
$1.98	1
$10.25	1
$19.75	1
$24.86	1
$24.13	1
$24.27	1
$18.40	1
$16.74	1
$0.90	1
$12.90	1
$6.01	2
$6.01	2
$13.74	2
$5.20	2
$5.59	2
$0.26	2
$2.07	2
$2.00	2
$1.15	2
$9.85	2
$10.26	2
$0.03	2
$14.72	2
$25.40	2
$25.15	2
$24.71	2
$1.44	2
$0.17	2
$0.47	2
$0.98	2
$0.50	2
$19.68	2
$2.06	2
$32.51	2
$0.13	2
$14.48	2
$4.25	2
$0.50	2
$0.94	2
$7.50	2
$2.92	2
$6.85	2
$0.47	2
$1.05	2
$0.19	2
$3.67	2
$26.94	3
$14.90	3
$1.05	3
$2.56	3
$2.56	3
$24.60	3
$23.04	3
$23.34	3
$23.71	3
$15.20	3
$14.97	3
$19.80	3
$14.90	3
$17.10	3
$19.35	3
$11.65	3
$9.42	3
$17.66	3
$17.63	3
$17.60	3
$17.90	3
$16.90	3
$17.81	3
$17.78	3
$17.34	3
$18.02	3
$17.40	3
$18.30	3
$17.84	3
$9.29	3
$9.55	3
$6.99	3
$0.52	3
$2.69	3
$1.05	3
$23.24	3

Task4

Introduction (Regression):

Performing simple linear regression in SPSS

We run simple linear regression when we want to access the relationship between two continuous variables.

We are running **Analyze/Regression/Linear** in SPSS to analyze the if the price of stocks in year 2015 were to be significant to determine the price of the stocks in year 2016.

The stock price in 2015 is called dependent variable and the stock price that we are going to predict in 2016 is called dependent variable.

Conclusion:

Based on the running test:

R Square = .817

Ordinary least squares estimate:

Y= -0.077 + 0.575X

X: Price of 3 groups in 2015 ----Independent variable

Y: Price of 3 groups in 2016 ----Dependent variable

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Price2015[b]	.	Enter

a. Dependent Variable: Price2016

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.904[a]	.817	.815	$3.76197

a. Predictors: (Constant), Price2015

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6689.185	1	6689.185	472.654	.000[b]
	Residual	1500.155	106	14.152		
	Total	8189.340	107			

a. Dependent Variable: Price2016

b. Predictors: (Constant), Price2015

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-.077	.575		-.135	.893	-1.217	1.063
	Price2015	.852	.039	.904	21.741	.000	.775	.930

a. Dependent Variable: Price2016

Stock Prices of all 3 groups in 2015 and 2016

Price2015	Price2016
$1.53	$0.67
$4.84	$4.10
$7.05	$5.58
$3.75	$4.40
$9.41	$9.20
$7.17	$6.83
$0.14	$0.13
$10.31	$6.22
$9.41	$9.20
$18.00	$19.28
$16.10	$28.12
$3.82	$1.40
$6.36	$4.24
$0.68	$4.71
$10.36	$10.30
$8.28	$5.10
$7.26	$7.20
$0.24	$1.32
$28.16	$37.87
$0.89	$0.18
$7.88	$6.54
$12.79	$11.64
$19.86	$20.60
$13.70	$7.81
$19.50	$10.27
$24.77	$13.33
$1.98	$2.95
$10.25	$7.00
$19.75	$15.00
$24.86	$19.54
$24.13	$19.19
$24.27	$18.80
$18.40	$17.25
$16.74	$12.37
$0.90	$0.30
$12.90	$12.00
$6.01	$7.84
$13.74	$14.42
$5.20	$2.00
$5.59	$4.57
$0.26	$0.18
$2.07	$1.19
$2.00	$1.90
$1.15	$0.65
$9.85	$8.32
$10.26	$7.40
$0.03	$0.03
$14.72	$1.70
$25.40	$23.89
$25.15	$19.03
$24.71	$17.90
$1.44	$0.98
$0.17	$0.09
$0.47	$0.25
$0.98	$0.98
$0.50	$0.41
$19.68	$16.00
$2.06	$1.30
$32.51	$32.09
$0.13	$0.08
$14.48	$36.09
$4.25	$6.93
$0.50	$0.07
$0.94	$0.69
$7.50	$4.30
$2.92	$2.96
$6.85	$7.08
$0.47	$0.19
$1.05	$1.09
$0.19	$0.10
$3.67	$2.55
$46.47	$42.48
$26.94	$21.97
$14.90	$10.05
$1.05	$0.48
$2.56	$1.28
$2.56	$6.56
$24.60	$19.03
$23.04	$17.87
$23.34	$20.59
$23.71	$20.79
$15.20	$10.02
$14.97	$9.98
$19.80	$14.00
$14.90	$10.05
$17.10	$14.68
$19.35	$12.30
$11.65	$9.27
$9.42	$6.81
$17.66	$14.00
$17.63	$14.65
$17.60	$14.19
$17.90	$14.12
$16.90	$14.00
$17.81	$14.15
$17.78	$14.25
$17.34	$13.70
$18.02	$14.08
$17.40	$13.35
$18.30	$13.98
$17.84	$14.16
$9.29	$5.49
$9.55	$6.80
$6.99	$4.61
$0.52	$0.34
$2.69	$1.79
$1.05	$1.67
$23.24	$17.13