

Your temporary usage period for IBM SPSS Statistics will expire in 3488 days.

```
* =====.
* Central Limit Theorem - SPSS Syntax.
* IMPORTANT:
* Run the Python workflow first. Python creates:
* 1) clt_clean_data_for_spss.csv
* 2) clt_sampling_means_wide_for_spss.csv
*
* Topic folder:
* D:\DATA ANALYSIS\A Basic Descriptive Statistics Guides\Central Limit Theorem
* =====.
```

```
SET UNICODE=ON.
SET DECIMAL=DOT.
SET PRINTBACK=ON.
SET TNUMBERS=VALUES.
SET TVARS=LABELS.
```

```
HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\A Basic Descriptive Statistics Guides\Central Limit Theorem" mkdir "D:\DATA ANALYSIS\A Basic Descriptive Statistics Guides\Central Limit Theorem"'].
```

Host

```
[DataSet0]
```

```
HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\A Basic Descriptive Statistics Guides\Central Limit Theorem\SPSS" mkdir "D:\DATA ANALYSIS\A Basic Descriptive Statistics Guides\Central Limit Theorem\SPSS"'].
```

Host

```
* =====.
* PART A: Import clean original dataset created/verified by Python.
* =====.
```

```
GET DATA
  /TYPE=TXT
```

```
/FILE="D:\DATA ANALYSIS\A Basic Descriptive Statistics Guides\Central Limit T
heorem\SPSS\clt_clean_data_for_spss.csv"
/ENCODING='UTF8'
/DELCASE=LINE
/DELIMITERS=","
/QUALIFIER='"'
/ARRANGEMENT=DELIMITED
/FIRSTCASE=2
/IMPORTCASE=ALL
/VARIABLES=
case_id F8.0
school A20
sex A20
age F8.2
studytime F8.2
failures F8.2
absences F8.2
G1 F8.2
G2 F8.2
G3 F8.2.
CACHE.
EXECUTE.
```

```
DATASET NAME CLTOriginalData WINDOW=FRONT.
```

```
VARIABLE LABELS
```

```
case_id "Case ID"
school "School"
sex "Sex"
age "Student age"
studytime "Weekly study time category"
failures "Number of past class failures"
absences "Number of school absences"
G1 "First period grade"
G2 "Second period grade"
G3 "Final grade".
```

```
VALUE LABELS studytime
```

```
1 "Less than 2 hours"
2 "2 to 5 hours"
3 "5 to 10 hours"
4 "More than 10 hours".
```

```
VALUE LABELS failures
```

```
0 "0 failures"
```

```
1 "1 failure"
```

```
2 "2 failures"
```

```
3 "3 failures".
```

```
EXECUTE.
```

```
TITLE "Central Limit Theorem: Original Data Check".
```

Central Limit Theorem: Original Data Check

```
DESCRIPTIVES VARIABLES=G1 G2 G3 absences age studytime failures  
/STATISTICS=MEAN STDDEV MIN MAX.
```

Descriptives

[CLTOriginalData]

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
First period grade	649	.00	19.00	11.3991	2.74527
Second period grade	649	.00	19.00	11.5701	2.91364
Final grade	649	.00	19.00	11.9060	3.23066
Number of school absences	649	.00	32.00	3.6595	4.64076
Student age	649	15.00	22.00	16.7442	1.21814
Weekly study time category	649	1.00	4.00	1.9307	.82951
Number of past class failures	649	.00	3.00	.2219	.59324
Valid N (listwise)	649				

```
FREQUENCIES VARIABLES=G3 absences  
/STATISTICS=MEAN MEDIAN STDDEV VARIANCE MINIMUM MAXIMUM SKEWNESS SESKEW KURTO  
SIS SEKURT  
/PERCENTILES=25 50 75  
/ORDER=ANALYSIS.
```

Frequencies

Central Limit Theorem: Original Data Check

Statistics

		Final grade	Number of school absences
N	Valid	649	649
	Missing	0	0
Mean		11.9060	3.6595
Median		12.0000	2.0000
Std. Deviation		3.23066	4.64076
Variance		10.437	21.537
Skewness		-.913	2.021
Std. Error of Skewness		.096	.096
Kurtosis		2.712	5.781
Std. Error of Kurtosis		.192	.192
Minimum		.00	.00
Maximum		19.00	32.00
Percentiles	25	10.0000	.0000
	50	12.0000	2.0000
	75	14.0000	6.0000

Frequency Table

Central Limit Theorem: Original Data Check

Final grade

		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	.00	15	2.3	2.3	2.3	
	1.00	1	.2	.2	2.5	
	5.00	1	.2	.2	2.6	
	6.00	3	.5	.5	3.1	
	7.00	10	1.5	1.5	4.6	
	8.00	35	5.4	5.4	10.0	
	9.00	35	5.4	5.4	15.4	
	10.00	97	14.9	14.9	30.4	
	11.00	104	16.0	16.0	46.4	
	12.00	72	11.1	11.1	57.5	
	13.00	82	12.6	12.6	70.1	
	14.00	63	9.7	9.7	79.8	
	15.00	49	7.6	7.6	87.4	
	16.00	36	5.5	5.5	92.9	
	17.00	29	4.5	4.5	97.4	
	18.00	15	2.3	2.3	99.7	
	19.00	2	.3	.3	100.0	
	Total		649	100.0	100.0	

Central Limit Theorem: Original Data Check

Number of school absences

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	244	37.6	37.6	37.6
	1.00	12	1.8	1.8	39.4
	2.00	110	16.9	16.9	56.4
	3.00	7	1.1	1.1	57.5
	4.00	93	14.3	14.3	71.8
	5.00	12	1.8	1.8	73.7
	6.00	49	7.6	7.6	81.2
	7.00	3	.5	.5	81.7
	8.00	42	6.5	6.5	88.1
	9.00	7	1.1	1.1	89.2
	10.00	21	3.2	3.2	92.4
	11.00	5	.8	.8	93.2
	12.00	12	1.8	1.8	95.1
	13.00	1	.2	.2	95.2
	14.00	8	1.2	1.2	96.5
	15.00	2	.3	.3	96.8
	16.00	10	1.5	1.5	98.3
	18.00	3	.5	.5	98.8
	21.00	2	.3	.3	99.1
	22.00	2	.3	.3	99.4
	24.00	1	.2	.2	99.5
26.00	1	.2	.2	99.7	
30.00	1	.2	.2	99.8	
32.00	1	.2	.2	100.0	
Total		649	100.0	100.0	

```

EXAMINE VARIABLES=G3 absences
/PLOT BOXPLOT HISTOGRAM NPLOT
/COMPARE GROUPS
/STATISTICS DESCRIPTIVES EXTREME
/CINTERVAL 95
/MISSING LISTWISE
/NOTOTAL.
    
```

Central Limit Theorem: Original Data Check

Explore

Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
	Final grade	649	100.0%	0	0.0%	649
Number of school absences	649	100.0%	0	0.0%	649	100.0%

Descriptives

		Statistic	Std. Error	
Final grade	Mean	11.9060	.12681	
	95% Confidence Interval for Mean	Lower Bound	11.6570	
		Upper Bound	12.1550	
	5% Trimmed Mean	12.0574		
	Median	12.0000		
	Variance	10.437		
	Std. Deviation	3.23066		
	Minimum	.00		
	Maximum	19.00		
	Range	19.00		
	Interquartile Range	4.00		
	Skewness	-.913	.096	
	Kurtosis	2.712	.192	
Number of school absences	Mean	3.6595	.18217	
	95% Confidence Interval for Mean	Lower Bound	3.3018	
		Upper Bound	4.0172	
	5% Trimmed Mean	3.0861		
	Median	2.0000		
	Variance	21.537		
	Std. Deviation	4.64076		
	Minimum	.00		
	Maximum	32.00		
	Range	32.00		
Interquartile Range	6.00			

Central Limit Theorem: Original Data Check

Descriptives

	Statistic	Std. Error
Skewness	2.021	.096
Kurtosis	5.781	.192

Extreme Values

		Case Number	Value
Final grade	Highest	1	339
		2	637
		3	114
		4	182
		5	186
	Lowest	1	641
		2	640
		3	638
		4	627
		5	611
Number of school absences	Highest	1	198
		2	213
		3	257
		4	151
		5	156
	Lowest	1	643
		2	642
		3	641
		4	640
		5	638

a. Only a partial list of cases with the value 18.00 are shown in the table of upper extremes.

b. Only a partial list of cases with the value .00 are shown in the table of lower extremes.

c. Only a partial list of cases with the value 22.00 are shown in the table of upper extremes.

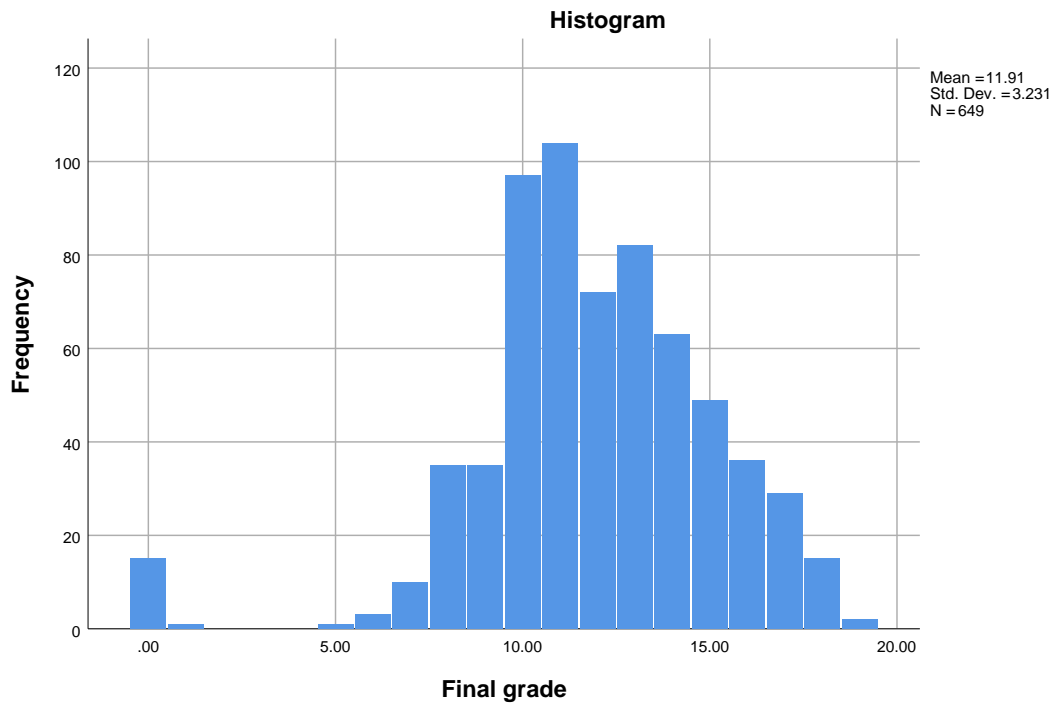
Central Limit Theorem: Original Data Check

Tests of Normality

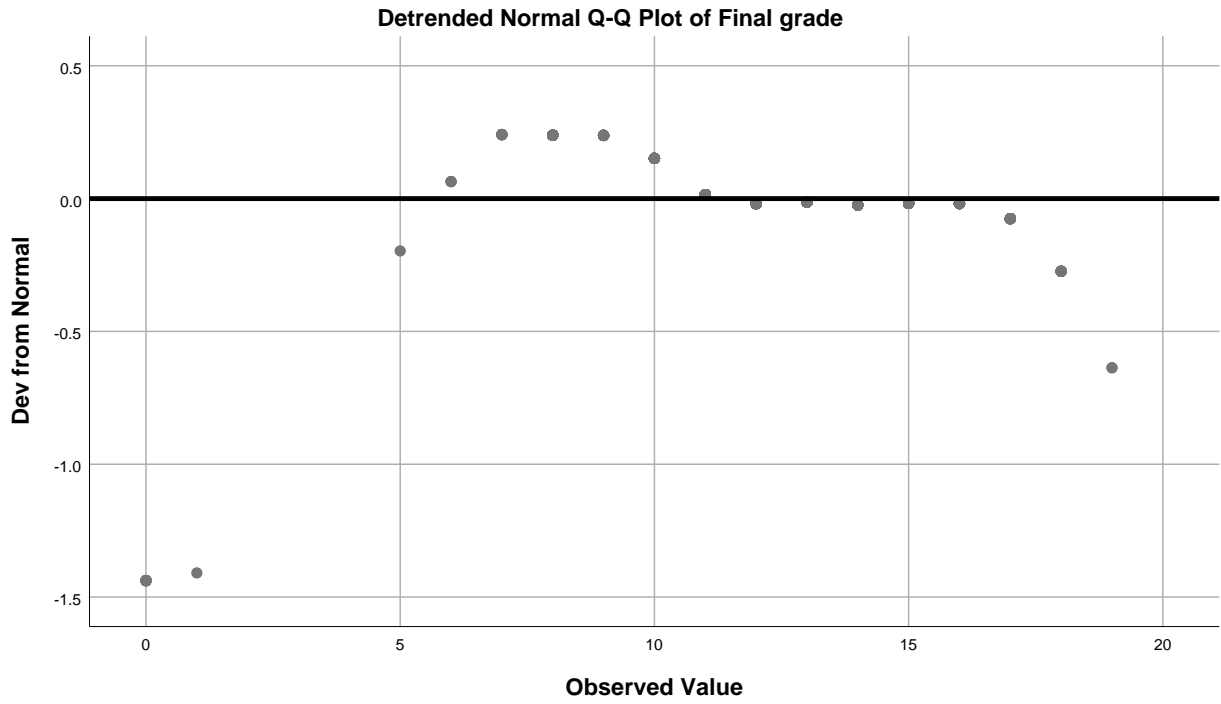
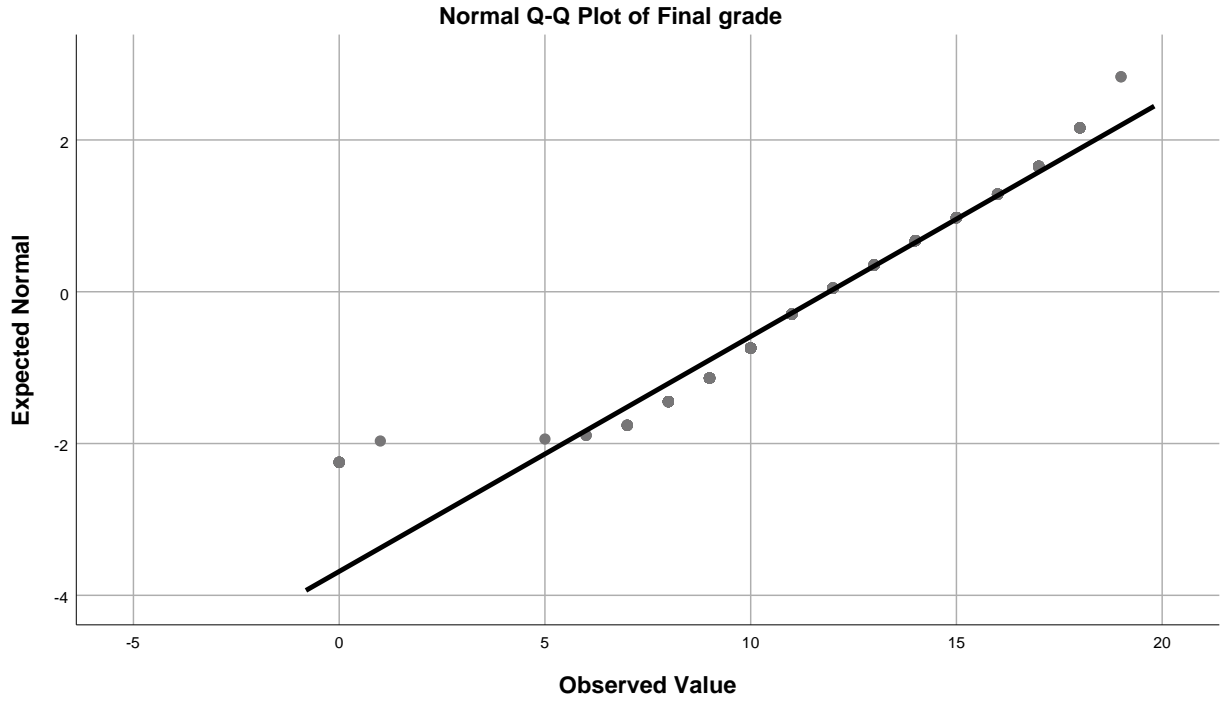
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Final grade	.124	649	.000	.926	649	.000
Number of school absences	.215	649	.000	.772	649	.000

a. Lilliefors Significance Correction

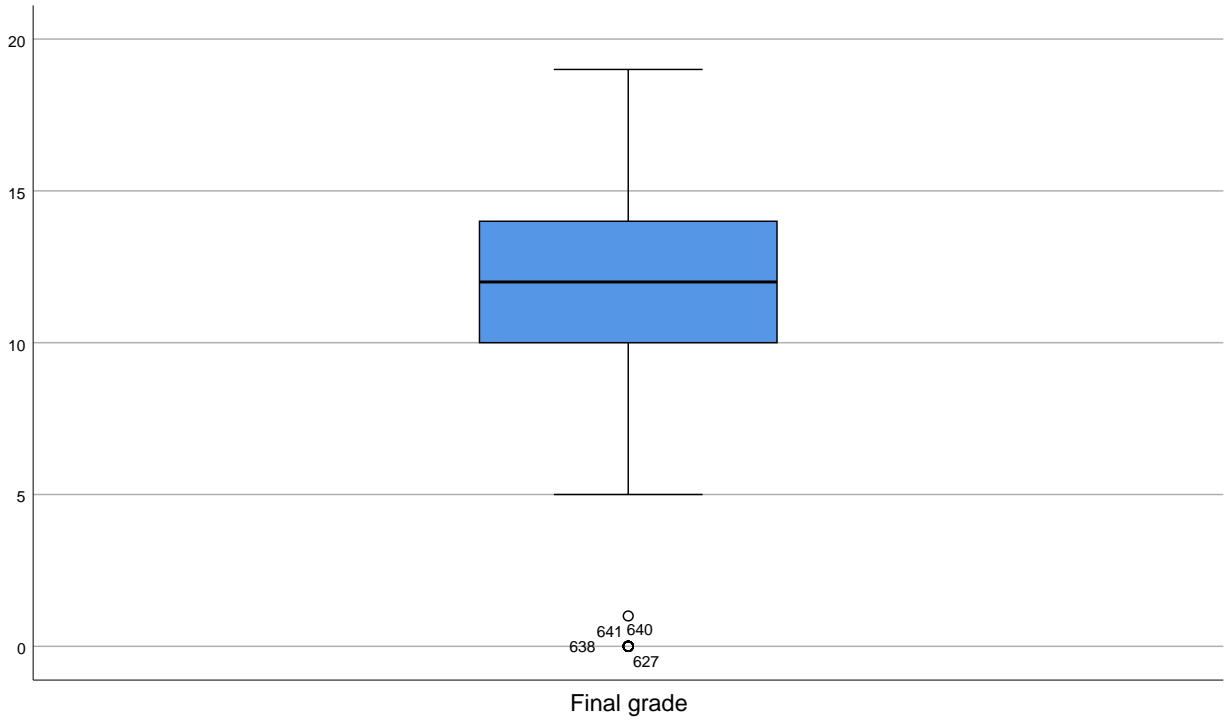
Final grade



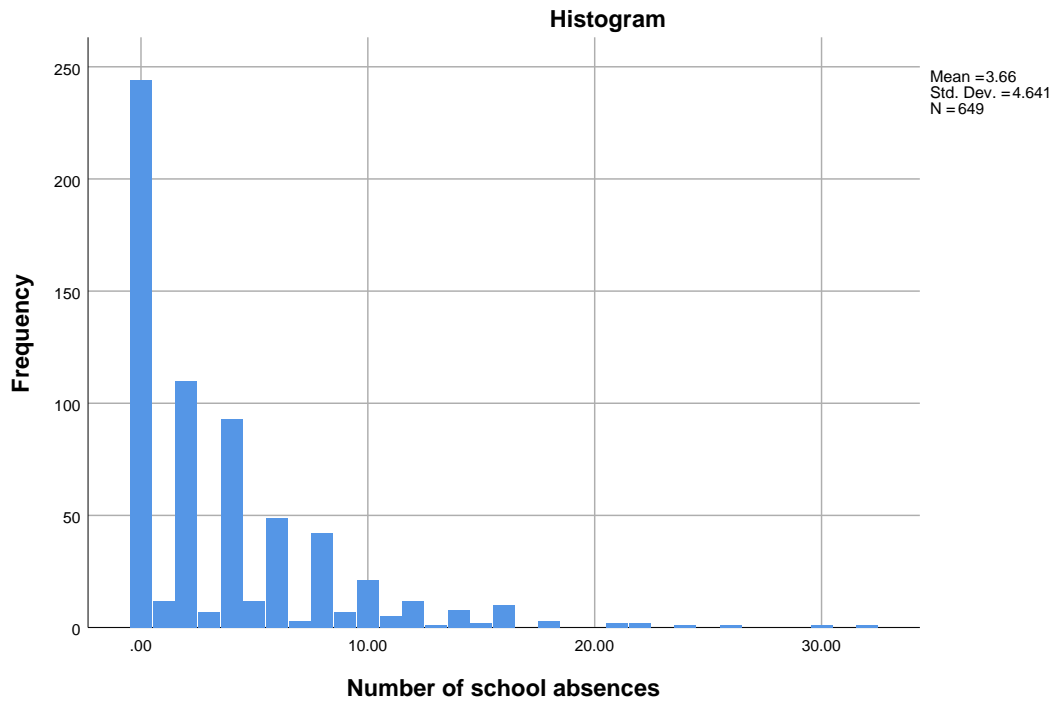
Central Limit Theorem: Original Data Check



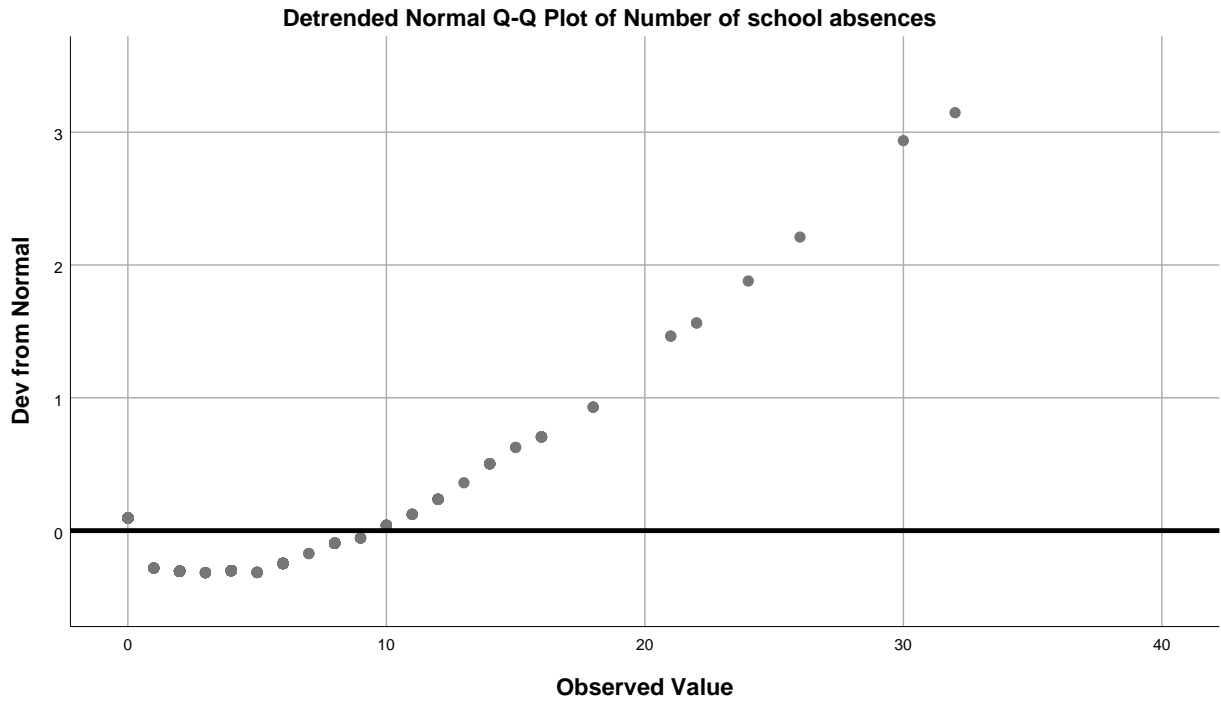
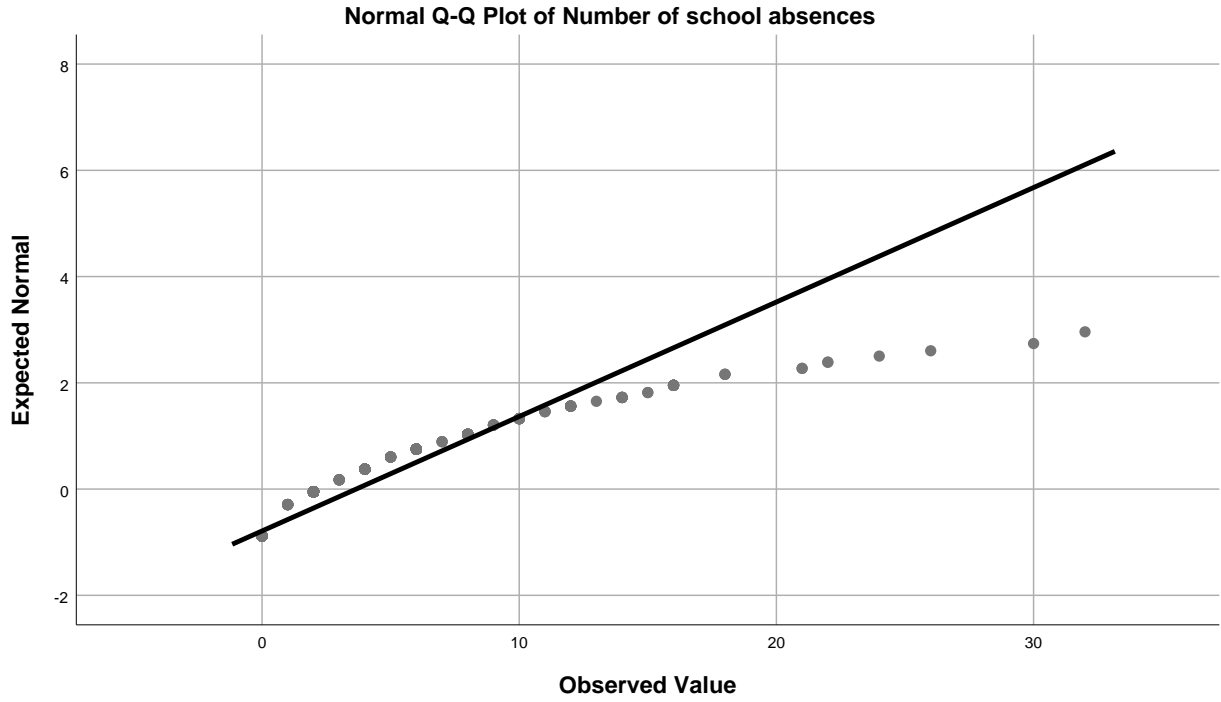
Central Limit Theorem: Original Data Check



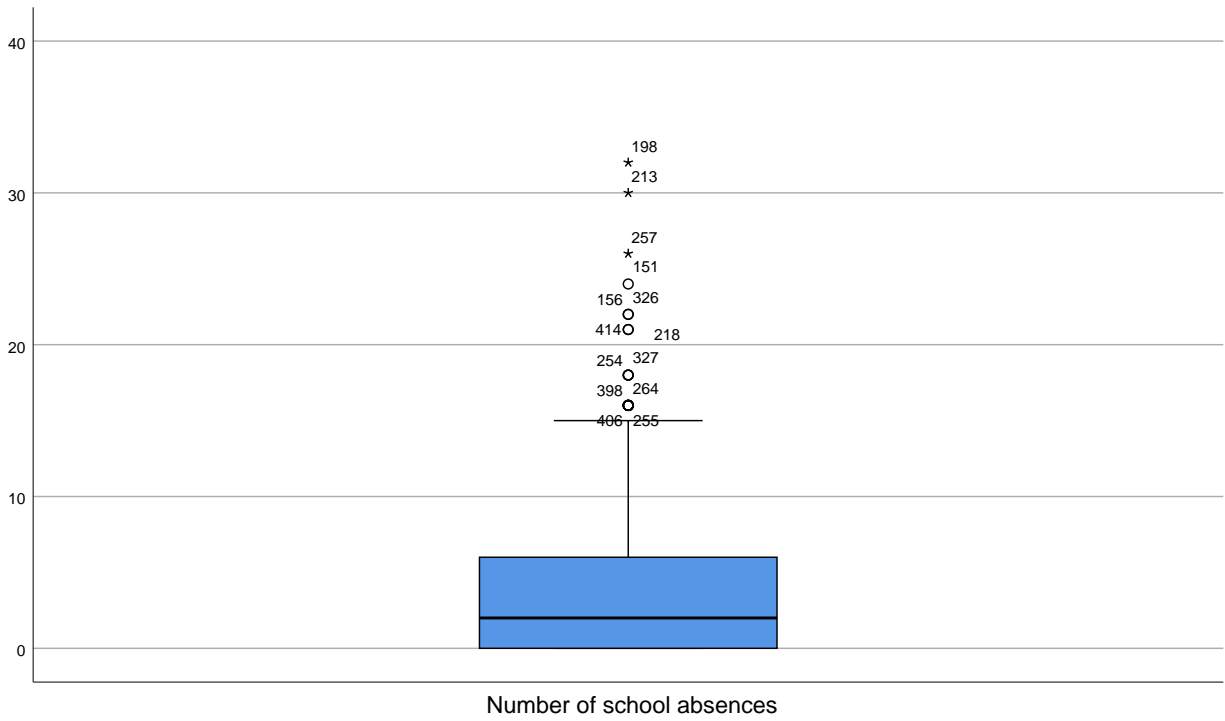
Number of school absences



Central Limit Theorem: Original Data Check



Central Limit Theorem: Original Data Check

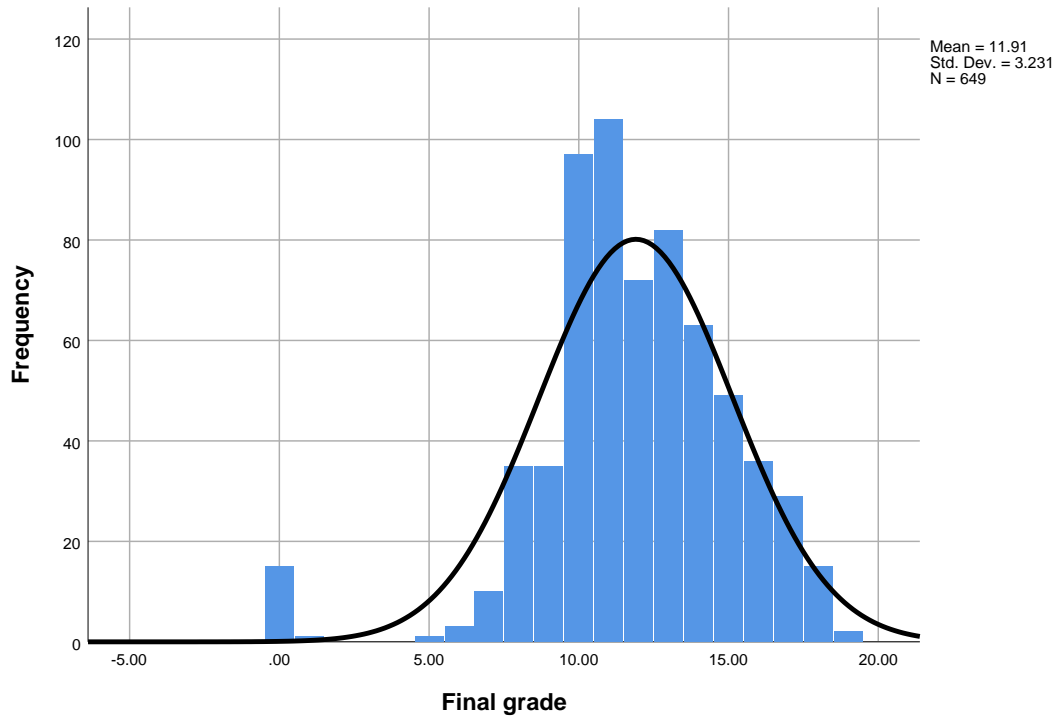


GRAPH

/HISTOGRAM(NORMAL)=G3.

Graph

Central Limit Theorem: Original Data Check

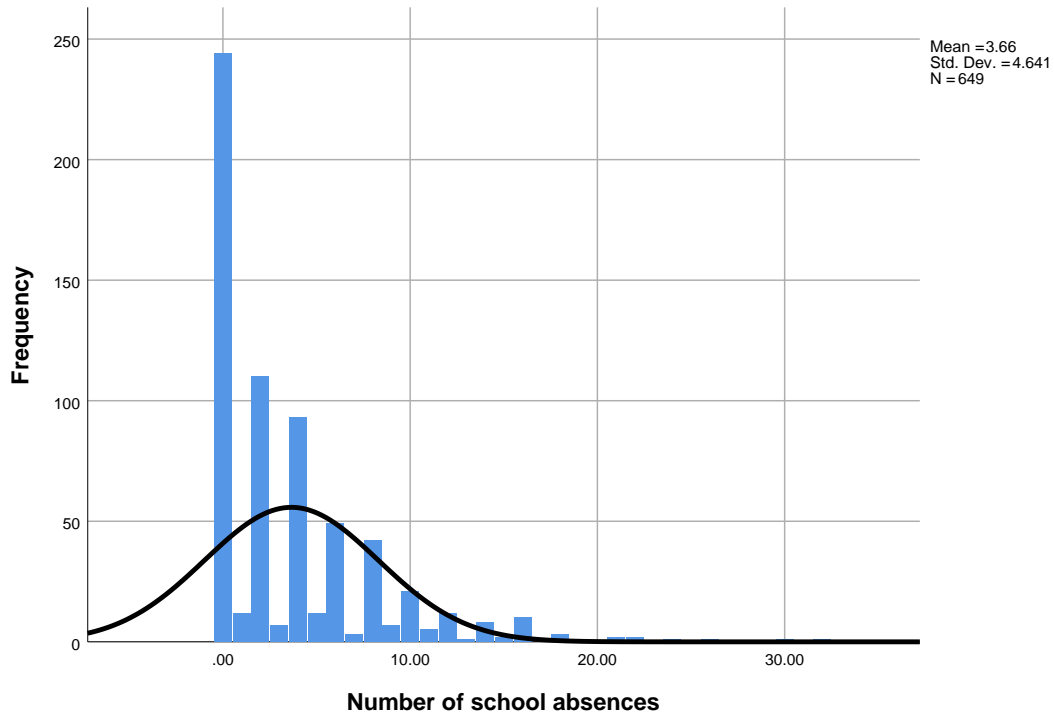


GRAPH

/HISTOGRAM(NORMAL)=absences.

Graph

Central Limit Theorem: Original Data Check



```
* =====.
* PART B: Import Python-generated CLT sampling distributions.
* =====.
```

```
GET DATA
  /TYPE=TEXT
  /FILE="D:\DATA ANALYSIS\A Basic Descriptive Statistics Guides\Central Limit Theorem\SPSS\clt_sampling_means_wide_for_spss.csv"
  /ENCODING='UTF8'
  /DELCASE=LINE
  /DELIMITERS=","
  /QUALIFIER='"'
  /ARRANGEMENT=DELIMITED
  /FIRSTCASE=2
  /IMPORTCASE=ALL
  /VARIABLES=
simulation_id F8.0
g3_mean_n5 F12.6
g3_mean_n10 F12.6
g3_mean_n30 F12.6
```

Central Limit Theorem: Original Data Check

```
g3_mean_n50 F12.6
g3_mean_n100 F12.6
absences_mean_n5 F12.6
absences_mean_n10 F12.6
absences_mean_n30 F12.6
absences_mean_n50 F12.6
absences_mean_n100 F12.6.
CACHE.
EXECUTE.

DATASET NAME CLTSamplingMeans WINDOW=FRONT.

VARIABLE LABELS
  simulation_id "Simulation ID"
  g3_mean_n5 "G3 sample mean, n=5"
  g3_mean_n10 "G3 sample mean, n=10"
  g3_mean_n30 "G3 sample mean, n=30"
  g3_mean_n50 "G3 sample mean, n=50"
  g3_mean_n100 "G3 sample mean, n=100"
  absences_mean_n5 "Absences sample mean, n=5"
  absences_mean_n10 "Absences sample mean, n=10"
  absences_mean_n30 "Absences sample mean, n=30"
  absences_mean_n50 "Absences sample mean, n=50"
  absences_mean_n100 "Absences sample mean, n=100".
EXECUTE.

TITLE "Central Limit Theorem: Sampling Distributions of the Mean".
```

Central Limit Theorem: Sampling Distributions of the Mean

DESCRIPTIVES VARIABLES=

```
g3_mean_n5 g3_mean_n10 g3_mean_n30 g3_mean_n50 g3_mean_n100
absences_mean_n5 absences_mean_n10 absences_mean_n30 absences_mean_n50 absences_mean_n100
/STATISTICS=MEAN STDDEV MIN MAX.
```

Descriptives

[CLTSamplingMeans]

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
G3 sample mean, n=5	5000	5.200000	16.600000	11.91736000	1.456212464
G3 sample mean, n=10	5000	7.600000	15.000000	11.90094000	1.012188728
G3 sample mean, n=30	5000	9.566667	13.933333	11.90086000	.588245055
G3 sample mean, n=50	5000	9.980000	13.440000	11.91424400	.459199827
G3 sample mean, n=100	5000	10.760000	13.030000	11.90284400	.323820079
Absences sample mean, n=5	5000	.000000	14.800000	3.67144000	2.057380589
Absences sample mean, n=10	5000	.200000	11.400000	3.64144000	1.466825498
Absences sample mean, n=30	5000	1.000000	6.933333	3.65428667	.846674079
Absences sample mean, n=50	5000	1.420000	6.180000	3.66823200	.657184824
Absences sample mean, n=100	5000	2.120000	5.430000	3.65805800	.469413249
Valid N (listwise)	5000				

FREQUENCIES VARIABLES=

```
g3_mean_n5 g3_mean_n10 g3_mean_n30 g3_mean_n50 g3_mean_n100
absences_mean_n5 absences_mean_n10 absences_mean_n30 absences_mean_n50 absences_mean_n100
/STATISTICS=MEAN MEDIAN STDDEV VARIANCE MINIMUM MAXIMUM SKEWNESS SESKEW KURTOSIS SEKURT
/PERCENTILES=25 50 75
/ORDER=ANALYSIS.
```

Frequencies

Central Limit Theorem: Sampling Distributions of the Mean

Statistics

		G3 sample mean, n=5	G3 sample mean, n=10	G3 sample mean, n=30	G3 sample mean, n=50
N	Valid	5000	5000	5000	5000
	Missing	0	0	0	0
Mean		11.91736000	11.90094000	11.90086000	11.91424400
Median		12.00000000	11.90000000	11.90000000	11.92000000
Std. Deviation		1.456212464	1.012188728	.588245055	.459199827
Variance		2.121	1.025	.346	.211
Skewness		-.376	-.345	-.169	-.090
Std. Error of Skewness		.035	.035	.035	.035
Kurtosis		.534	.271	.114	-.019
Std. Error of Kurtosis		.069	.069	.069	.069
Minimum		5.200000	7.600000	9.566667	9.980000
Maximum		16.600000	15.000000	13.933333	13.440000
Percentiles	25	11.00000000	11.30000000	11.50000000	11.60000000
	50	12.00000000	11.90000000	11.90000000	11.92000000
	75	13.00000000	12.60000000	12.30000000	12.22000000

Central Limit Theorem: Sampling Distributions of the Mean

Statistics

		G3 sample mean, n=100	Absences sample mean, n=5	Absences sample mean, n=10	Absences sample mean, n=30
N	Valid	5000	5000	5000	5000
	Missing	0	0	0	0
Mean		11.90284400	3.67144000	3.64144000	3.65428667
Median		11.91000000	3.40000000	3.50000000	3.60000000
Std. Deviation		.323820079	2.057380589	1.466825498	.846674079
Variance		.105	4.233	2.152	.717
Skewness		-.134	.928	.667	.364
Std. Error of Skewness		.035	.035	.035	.035
Kurtosis		-.004	1.261	.651	.154
Std. Error of Kurtosis		.069	.069	.069	.069
Minimum		10.760000	.000000	.200000	1.000000
Maximum		13.030000	14.800000	11.400000	6.933333
Percentiles	25	11.69000000	2.20000000	2.60000000	3.06666667
	50	11.91000000	3.40000000	3.50000000	3.60000000
	75	12.12000000	4.80000000	4.50000000	4.20000000

Central Limit Theorem: Sampling Distributions of the Mean

Statistics

		Absences sample mean, n=50	Absences sample mean, n=100
N	Valid	5000	5000
	Missing	0	0
Mean		3.66823200	3.65805800
Median		3.64000000	3.64000000
Std. Deviation		.657184824	.469413249
Variance		.432	.220
Skewness		.280	.199
Std. Error of Skewness		.035	.035
Kurtosis		.086	.002
Std. Error of Kurtosis		.069	.069
Minimum		1.420000	2.120000
Maximum		6.180000	5.430000
Percentiles	25	3.22000000	3.33000000
	50	3.64000000	3.64000000
	75	4.08000000	3.96000000

Frequency Table

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5.200000	1	.0	.0	.0
	6.000000	1	.0	.0	.0
	6.200000	1	.0	.0	.1
	6.400000	3	.1	.1	.1
	6.600000	2	.0	.0	.2
	6.800000	4	.1	.1	.2
	7.000000	2	.0	.0	.3
	7.200000	9	.2	.2	.5
	7.400000	5	.1	.1	.6
	7.600000	3	.1	.1	.6
	7.800000	8	.2	.2	.8
	8.000000	17	.3	.3	1.1
	8.200000	11	.2	.2	1.3
	8.400000	29	.6	.6	1.9
	8.600000	22	.4	.4	2.4
	8.800000	35	.7	.7	3.1
	9.000000	42	.8	.8	3.9
	9.200000	47	.9	.9	4.8
	9.400000	61	1.2	1.2	6.1
	9.600000	58	1.2	1.2	7.2
	9.800000	64	1.3	1.3	8.5
	10.000000	87	1.7	1.7	10.2
	10.200000	108	2.2	2.2	12.4
	10.400000	141	2.8	2.8	15.2
	10.600000	150	3.0	3.0	18.2
	10.800000	186	3.7	3.7	21.9
	11.000000	200	4.0	4.0	25.9
	11.200000	240	4.8	4.8	30.7
	11.400000	271	5.4	5.4	36.2
	11.600000	272	5.4	5.4	41.6
11.800000	310	6.2	6.2	47.8	
12.000000	284	5.7	5.7	53.5	
12.200000	288	5.8	5.8	59.2	

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=5

	Frequency	Percent	Valid Percent	Cumulative Percent
12.400000	262	5.2	5.2	64.5
12.600000	268	5.4	5.4	69.8
12.800000	247	4.9	4.9	74.8
13.000000	245	4.9	4.9	79.7
13.200000	221	4.4	4.4	84.1
13.400000	160	3.2	3.2	87.3
13.600000	158	3.2	3.2	90.5
13.800000	106	2.1	2.1	92.6
14.000000	86	1.7	1.7	94.3
14.200000	77	1.5	1.5	95.8
14.400000	59	1.2	1.2	97.0
14.600000	44	.9	.9	97.9
14.800000	40	.8	.8	98.7
15.000000	21	.4	.4	99.1
15.200000	15	.3	.3	99.4
15.400000	12	.2	.2	99.7
15.600000	8	.2	.2	99.8
16.000000	3	.1	.1	99.9
16.200000	3	.1	.1	99.9
16.400000	2	.0	.0	100.0
16.600000	1	.0	.0	100.0
Total	5000	100.0	100.0	

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=10

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	7.600000	2	.0	.0	.0
	7.700000	1	.0	.0	.1
	7.800000	1	.0	.0	.1
	8.100000	1	.0	.0	.1
	8.300000	2	.0	.0	.1
	8.400000	1	.0	.0	.2
	8.500000	1	.0	.0	.2
	8.600000	4	.1	.1	.3
	8.700000	3	.1	.1	.3
	8.800000	4	.1	.1	.4
	8.900000	2	.0	.0	.4
	9.000000	6	.1	.1	.6
	9.100000	6	.1	.1	.7
	9.200000	11	.2	.2	.9
	9.300000	10	.2	.2	1.1
	9.400000	22	.4	.4	1.5
	9.500000	20	.4	.4	1.9
	9.600000	20	.4	.4	2.3
	9.700000	20	.4	.4	2.7
	9.800000	25	.5	.5	3.2
	9.900000	27	.5	.5	3.8
	10.000000	26	.5	.5	4.3
	10.100000	34	.7	.7	5.0
	10.200000	41	.8	.8	5.8
	10.300000	46	.9	.9	6.7
	10.400000	66	1.3	1.3	8.0
	10.500000	62	1.2	1.2	9.3
	10.600000	87	1.7	1.7	11.0
	10.700000	87	1.7	1.7	12.8
	10.800000	95	1.9	1.9	14.7
10.900000	101	2.0	2.0	16.7	
11.000000	104	2.1	2.1	18.8	
11.100000	136	2.7	2.7	21.5	

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=10

	Frequency	Percent	Valid Percent	Cumulative Percent
11.200000	165	3.3	3.3	24.8
11.300000	157	3.1	3.1	27.9
11.400000	161	3.2	3.2	31.1
11.500000	172	3.4	3.4	34.6
11.600000	182	3.6	3.6	38.2
11.700000	201	4.0	4.0	42.2
11.800000	196	3.9	3.9	46.2
11.900000	195	3.9	3.9	50.1
12.000000	190	3.8	3.8	53.9
12.100000	171	3.4	3.4	57.3
12.200000	207	4.1	4.1	61.4
12.300000	197	3.9	3.9	65.4
12.400000	194	3.9	3.9	69.2
12.500000	200	4.0	4.0	73.2
12.600000	173	3.5	3.5	76.7
12.700000	154	3.1	3.1	79.8
12.800000	158	3.2	3.2	82.9
12.900000	139	2.8	2.8	85.7
13.000000	117	2.3	2.3	88.1
13.100000	99	2.0	2.0	90.0
13.200000	82	1.6	1.6	91.7
13.300000	73	1.5	1.5	93.1
13.400000	85	1.7	1.7	94.8
13.500000	69	1.4	1.4	96.2
13.600000	39	.8	.8	97.0
13.700000	39	.8	.8	97.8
13.800000	28	.6	.6	98.3
13.900000	18	.4	.4	98.7
14.000000	17	.3	.3	99.0
14.100000	13	.3	.3	99.3
14.200000	10	.2	.2	99.5
14.300000	5	.1	.1	99.6
14.400000	9	.2	.2	99.8

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=10

	Frequency	Percent	Valid Percent	Cumulative Percent
14.500000	3	.1	.1	99.8
14.600000	4	.1	.1	99.9
14.700000	2	.0	.0	100.0
14.900000	1	.0	.0	100.0
15.000000	1	.0	.0	100.0
Total	5000	100.0	100.0	

G3 sample mean, n=30

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 9.566667	1	.0	.0	.0
9.600000	1	.0	.0	.0
9.733333	1	.0	.0	.1
9.766667	1	.0	.0	.1
9.866667	1	.0	.0	.1
9.933333	1	.0	.0	.1
10.000000	2	.0	.0	.2
10.033333	3	.1	.1	.2
10.066667	1	.0	.0	.2
10.100000	3	.1	.1	.3
10.133333	3	.1	.1	.4
10.166667	1	.0	.0	.4
10.200000	2	.0	.0	.4
10.233333	2	.0	.0	.5
10.266667	1	.0	.0	.5
10.300000	1	.0	.0	.5
10.333333	4	.1	.1	.6
10.366667	5	.1	.1	.7
10.400000	9	.2	.2	.9
10.433333	5	.1	.1	1.0
10.466667	7	.1	.1	1.1
10.500000	11	.2	.2	1.3
10.533333	12	.2	.2	1.6

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=30

	Frequency	Percent	Valid Percent	Cumulative Percent
10.566667	9	.2	.2	1.7
10.600000	11	.2	.2	2.0
10.633333	15	.3	.3	2.3
10.666667	12	.2	.2	2.5
10.700000	15	.3	.3	2.8
10.733333	14	.3	.3	3.1
10.766667	13	.3	.3	3.3
10.800000	21	.4	.4	3.8
10.833333	18	.4	.4	4.1
10.866667	24	.5	.5	4.6
10.900000	18	.4	.4	5.0
10.933333	34	.7	.7	5.6
10.966667	30	.6	.6	6.2
11.000000	29	.6	.6	6.8
11.033333	39	.8	.8	7.6
11.066667	42	.8	.8	8.4
11.100000	38	.8	.8	9.2
11.133333	48	1.0	1.0	10.2
11.166667	51	1.0	1.0	11.2
11.200000	56	1.1	1.1	12.3
11.233333	54	1.1	1.1	13.4
11.266667	66	1.3	1.3	14.7
11.300000	51	1.0	1.0	15.7
11.333333	72	1.4	1.4	17.2
11.366667	62	1.2	1.2	18.4
11.400000	69	1.4	1.4	19.8
11.433333	78	1.6	1.6	21.3
11.466667	93	1.9	1.9	23.2
11.500000	95	1.9	1.9	25.1
11.533333	94	1.9	1.9	27.0
11.566667	98	2.0	2.0	28.9
11.600000	94	1.9	1.9	30.8
11.633333	99	2.0	2.0	32.8

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=30

	Frequency	Percent	Valid Percent	Cumulative Percent
11.666667	98	2.0	2.0	34.8
11.700000	95	1.9	1.9	36.7
11.733333	118	2.4	2.4	39.0
11.766667	98	2.0	2.0	41.0
11.800000	109	2.2	2.2	43.2
11.833333	120	2.4	2.4	45.6
11.866667	109	2.2	2.2	47.7
11.900000	114	2.3	2.3	50.0
11.933333	94	1.9	1.9	51.9
11.966667	127	2.5	2.5	54.4
12.000000	115	2.3	2.3	56.7
12.033333	120	2.4	2.4	59.1
12.066667	122	2.4	2.4	61.6
12.100000	109	2.2	2.2	63.8
12.133333	92	1.8	1.8	65.6
12.166667	106	2.1	2.1	67.7
12.200000	100	2.0	2.0	69.7
12.233333	101	2.0	2.0	71.7
12.266667	97	1.9	1.9	73.7
12.300000	108	2.2	2.2	75.8
12.333333	88	1.8	1.8	77.6
12.366667	89	1.8	1.8	79.4
12.400000	100	2.0	2.0	81.4
12.433333	67	1.3	1.3	82.7
12.466667	74	1.5	1.5	84.2
12.500000	65	1.3	1.3	85.5
12.533333	65	1.3	1.3	86.8
12.566667	60	1.2	1.2	88.0
12.600000	69	1.4	1.4	89.4
12.633333	38	.8	.8	90.1
12.666667	40	.8	.8	90.9
12.700000	60	1.2	1.2	92.1
12.733333	50	1.0	1.0	93.1

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=30

	Frequency	Percent	Valid Percent	Cumulative Percent
12.766667	36	.7	.7	93.9
12.800000	36	.7	.7	94.6
12.833333	34	.7	.7	95.3
12.866667	28	.6	.6	95.8
12.900000	28	.6	.6	96.4
12.933333	16	.3	.3	96.7
12.966667	23	.5	.5	97.2
13.000000	20	.4	.4	97.6
13.033333	16	.3	.3	97.9
13.066667	18	.4	.4	98.2
13.100000	11	.2	.2	98.5
13.133333	10	.2	.2	98.7
13.166667	9	.2	.2	98.8
13.200000	8	.2	.2	99.0
13.233333	8	.2	.2	99.2
13.266667	9	.2	.2	99.3
13.300000	4	.1	.1	99.4
13.333333	10	.2	.2	99.6
13.366667	4	.1	.1	99.7
13.400000	1	.0	.0	99.7
13.466667	2	.0	.0	99.8
13.500000	1	.0	.0	99.8
13.566667	4	.1	.1	99.9
13.600000	1	.0	.0	99.9
13.633333	3	.1	.1	99.9
13.733333	1	.0	.0	100.0
13.766667	1	.0	.0	100.0
13.933333	1	.0	.0	100.0
Total	5000	100.0	100.0	

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=50

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	9.980000	1	.0	.0	.0
	10.260000	1	.0	.0	.0
	10.340000	1	.0	.0	.1
	10.460000	1	.0	.0	.1
	10.480000	1	.0	.0	.1
	10.520000	2	.0	.0	.1
	10.540000	4	.1	.1	.2
	10.560000	2	.0	.0	.3
	10.600000	2	.0	.0	.3
	10.620000	2	.0	.0	.3
	10.640000	3	.1	.1	.4
	10.660000	2	.0	.0	.4
	10.680000	2	.0	.0	.5
	10.700000	3	.1	.1	.5
	10.720000	2	.0	.0	.6
	10.740000	1	.0	.0	.6
	10.760000	6	.1	.1	.7
	10.780000	1	.0	.0	.7
	10.800000	4	.1	.1	.8
	10.820000	7	.1	.1	1.0
	10.840000	9	.2	.2	1.1
	10.860000	9	.2	.2	1.3
	10.880000	9	.2	.2	1.5
	10.900000	7	.1	.1	1.6
	10.920000	7	.1	.1	1.8
	10.940000	13	.3	.3	2.0
	10.960000	13	.3	.3	2.3
	10.980000	10	.2	.2	2.5
	11.000000	9	.2	.2	2.7
	11.020000	12	.2	.2	2.9
11.040000	19	.4	.4	3.3	
11.060000	16	.3	.3	3.6	
11.080000	19	.4	.4	4.0	

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=50

	Frequency	Percent	Valid Percent	Cumulative Percent
11.100000	19	.4	.4	4.4
11.120000	18	.4	.4	4.7
11.140000	19	.4	.4	5.1
11.160000	19	.4	.4	5.5
11.180000	20	.4	.4	5.9
11.200000	19	.4	.4	6.3
11.220000	32	.6	.6	6.9
11.240000	36	.7	.7	7.6
11.260000	28	.6	.6	8.2
11.280000	35	.7	.7	8.9
11.300000	35	.7	.7	9.6
11.320000	35	.7	.7	10.3
11.340000	38	.8	.8	11.1
11.360000	37	.7	.7	11.8
11.380000	46	.9	.9	12.7
11.400000	54	1.1	1.1	13.8
11.420000	53	1.1	1.1	14.9
11.440000	46	.9	.9	15.8
11.460000	52	1.0	1.0	16.8
11.480000	53	1.1	1.1	17.9
11.500000	53	1.1	1.1	18.9
11.520000	61	1.2	1.2	20.2
11.540000	60	1.2	1.2	21.4
11.560000	72	1.4	1.4	22.8
11.580000	63	1.3	1.3	24.1
11.600000	64	1.3	1.3	25.3
11.620000	71	1.4	1.4	26.8
11.640000	73	1.5	1.5	28.2
11.660000	64	1.3	1.3	29.5
11.680000	73	1.5	1.5	31.0
11.700000	74	1.5	1.5	32.4
11.720000	82	1.6	1.6	34.1
11.740000	75	1.5	1.5	35.6

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=50

	Frequency	Percent	Valid Percent	Cumulative Percent
11.760000	63	1.3	1.3	36.8
11.780000	76	1.5	1.5	38.4
11.800000	98	2.0	2.0	40.3
11.820000	92	1.8	1.8	42.2
11.840000	72	1.4	1.4	43.6
11.860000	94	1.9	1.9	45.5
11.880000	80	1.6	1.6	47.1
11.900000	89	1.8	1.8	48.9
11.920000	81	1.6	1.6	50.5
11.940000	88	1.8	1.8	52.2
11.960000	81	1.6	1.6	53.9
11.980000	90	1.8	1.8	55.7
12.000000	97	1.9	1.9	57.6
12.020000	88	1.8	1.8	59.4
12.040000	82	1.6	1.6	61.0
12.060000	83	1.7	1.7	62.7
12.080000	96	1.9	1.9	64.6
12.100000	76	1.5	1.5	66.1
12.120000	81	1.6	1.6	67.7
12.140000	86	1.7	1.7	69.4
12.160000	85	1.7	1.7	71.1
12.180000	70	1.4	1.4	72.5
12.200000	81	1.6	1.6	74.2
12.220000	58	1.2	1.2	75.3
12.240000	66	1.3	1.3	76.6
12.260000	59	1.2	1.2	77.8
12.280000	67	1.3	1.3	79.2
12.300000	61	1.2	1.2	80.4
12.320000	58	1.2	1.2	81.5
12.340000	60	1.2	1.2	82.7
12.360000	60	1.2	1.2	83.9
12.380000	53	1.1	1.1	85.0
12.400000	57	1.1	1.1	86.1

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=50

	Frequency	Percent	Valid Percent	Cumulative Percent
12.420000	54	1.1	1.1	87.2
12.440000	31	.6	.6	87.8
12.460000	43	.9	.9	88.7
12.480000	42	.8	.8	89.5
12.500000	47	.9	.9	90.5
12.520000	35	.7	.7	91.2
12.540000	38	.8	.8	91.9
12.560000	32	.6	.6	92.6
12.580000	24	.5	.5	93.1
12.600000	25	.5	.5	93.6
12.620000	29	.6	.6	94.1
12.640000	24	.5	.5	94.6
12.660000	27	.5	.5	95.2
12.680000	18	.4	.4	95.5
12.700000	29	.6	.6	96.1
12.720000	14	.3	.3	96.4
12.740000	26	.5	.5	96.9
12.760000	13	.3	.3	97.2
12.780000	13	.3	.3	97.4
12.800000	16	.3	.3	97.7
12.820000	18	.4	.4	98.1
12.840000	12	.2	.2	98.3
12.860000	8	.2	.2	98.5
12.880000	5	.1	.1	98.6
12.900000	5	.1	.1	98.7
12.920000	6	.1	.1	98.8
12.940000	6	.1	.1	98.9
12.960000	7	.1	.1	99.1
12.980000	5	.1	.1	99.2
13.000000	6	.1	.1	99.3
13.020000	3	.1	.1	99.4
13.040000	6	.1	.1	99.5
13.060000	3	.1	.1	99.5

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=50

	Frequency	Percent	Valid Percent	Cumulative Percent
13.080000	4	.1	.1	99.6
13.100000	3	.1	.1	99.7
13.120000	5	.1	.1	99.8
13.140000	1	.0	.0	99.8
13.160000	2	.0	.0	99.8
13.180000	1	.0	.0	99.9
13.240000	2	.0	.0	99.9
13.320000	2	.0	.0	99.9
13.340000	1	.0	.0	100.0
13.420000	1	.0	.0	100.0
13.440000	1	.0	.0	100.0
Total	5000	100.0	100.0	

G3 sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 10.760000	1	.0	.0	.0
10.780000	1	.0	.0	.0
10.790000	1	.0	.0	.1
10.800000	2	.0	.0	.1
10.810000	1	.0	.0	.1
10.820000	1	.0	.0	.1
10.900000	1	.0	.0	.2
10.910000	1	.0	.0	.2
10.940000	1	.0	.0	.2
10.950000	2	.0	.0	.2
10.960000	2	.0	.0	.3
10.980000	1	.0	.0	.3
10.990000	3	.1	.1	.4
11.000000	2	.0	.0	.4
11.010000	1	.0	.0	.4
11.030000	4	.1	.1	.5
11.040000	4	.1	.1	.6

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
11.050000	3	.1	.1	.6
11.060000	3	.1	.1	.7
11.070000	1	.0	.0	.7
11.090000	3	.1	.1	.8
11.100000	5	.1	.1	.9
11.110000	5	.1	.1	1.0
11.120000	3	.1	.1	1.0
11.130000	8	.2	.2	1.2
11.140000	3	.1	.1	1.3
11.150000	5	.1	.1	1.4
11.160000	7	.1	.1	1.5
11.170000	8	.2	.2	1.7
11.190000	7	.1	.1	1.8
11.200000	9	.2	.2	2.0
11.210000	7	.1	.1	2.1
11.220000	9	.2	.2	2.3
11.230000	5	.1	.1	2.4
11.240000	5	.1	.1	2.5
11.250000	8	.2	.2	2.7
11.260000	18	.4	.4	3.0
11.270000	7	.1	.1	3.2
11.280000	9	.2	.2	3.3
11.290000	14	.3	.3	3.6
11.300000	7	.1	.1	3.8
11.310000	5	.1	.1	3.9
11.320000	13	.3	.3	4.1
11.330000	16	.3	.3	4.4
11.340000	14	.3	.3	4.7
11.350000	11	.2	.2	4.9
11.360000	14	.3	.3	5.2
11.370000	6	.1	.1	5.3
11.380000	9	.2	.2	5.5
11.390000	28	.6	.6	6.1

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
11.400000	21	.4	.4	6.5
11.410000	18	.4	.4	6.9
11.420000	24	.5	.5	7.3
11.430000	19	.4	.4	7.7
11.440000	20	.4	.4	8.1
11.450000	16	.3	.3	8.4
11.460000	24	.5	.5	8.9
11.470000	22	.4	.4	9.4
11.480000	29	.6	.6	9.9
11.490000	27	.5	.5	10.5
11.500000	28	.6	.6	11.0
11.510000	30	.6	.6	11.6
11.520000	33	.7	.7	12.3
11.530000	23	.5	.5	12.8
11.540000	34	.7	.7	13.4
11.550000	27	.5	.5	14.0
11.560000	37	.7	.7	14.7
11.570000	43	.9	.9	15.6
11.580000	48	1.0	1.0	16.5
11.590000	28	.6	.6	17.1
11.600000	42	.8	.8	17.9
11.610000	45	.9	.9	18.8
11.620000	40	.8	.8	19.6
11.630000	35	.7	.7	20.3
11.640000	38	.8	.8	21.1
11.650000	49	1.0	1.0	22.1
11.660000	56	1.1	1.1	23.2
11.670000	38	.8	.8	24.0
11.680000	46	.9	.9	24.9
11.690000	40	.8	.8	25.7
11.700000	49	1.0	1.0	26.7
11.710000	54	1.1	1.1	27.7
11.720000	43	.9	.9	28.6

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
11.730000	62	1.2	1.2	29.8
11.740000	43	.9	.9	30.7
11.750000	57	1.1	1.1	31.8
11.760000	56	1.1	1.1	33.0
11.770000	55	1.1	1.1	34.1
11.780000	65	1.3	1.3	35.4
11.790000	46	.9	.9	36.3
11.800000	67	1.3	1.3	37.6
11.810000	51	1.0	1.0	38.6
11.820000	58	1.2	1.2	39.8
11.830000	63	1.3	1.3	41.1
11.840000	58	1.2	1.2	42.2
11.850000	56	1.1	1.1	43.3
11.860000	59	1.2	1.2	44.5
11.870000	54	1.1	1.1	45.6
11.880000	60	1.2	1.2	46.8
11.890000	65	1.3	1.3	48.1
11.900000	54	1.1	1.1	49.2
11.910000	59	1.2	1.2	50.4
11.920000	64	1.3	1.3	51.6
11.930000	62	1.2	1.2	52.9
11.940000	68	1.4	1.4	54.2
11.950000	57	1.1	1.1	55.4
11.960000	66	1.3	1.3	56.7
11.970000	50	1.0	1.0	57.7
11.980000	59	1.2	1.2	58.9
11.990000	54	1.1	1.1	60.0
12.000000	69	1.4	1.4	61.3
12.010000	69	1.4	1.4	62.7
12.020000	62	1.2	1.2	64.0
12.030000	52	1.0	1.0	65.0
12.040000	53	1.1	1.1	66.1
12.050000	51	1.0	1.0	67.1

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
12.060000	55	1.1	1.1	68.2
12.070000	60	1.2	1.2	69.4
12.080000	51	1.0	1.0	70.4
12.090000	48	1.0	1.0	71.4
12.100000	66	1.3	1.3	72.7
12.110000	59	1.2	1.2	73.9
12.120000	58	1.2	1.2	75.0
12.130000	57	1.1	1.1	76.2
12.140000	42	.8	.8	77.0
12.150000	54	1.1	1.1	78.1
12.160000	36	.7	.7	78.8
12.170000	34	.7	.7	79.5
12.180000	56	1.1	1.1	80.6
12.190000	48	1.0	1.0	81.6
12.200000	47	.9	.9	82.5
12.210000	49	1.0	1.0	83.5
12.220000	32	.6	.6	84.1
12.230000	34	.7	.7	84.8
12.240000	38	.8	.8	85.6
12.250000	43	.9	.9	86.4
12.260000	33	.7	.7	87.1
12.270000	34	.7	.7	87.8
12.280000	40	.8	.8	88.6
12.290000	31	.6	.6	89.2
12.300000	30	.6	.6	89.8
12.310000	36	.7	.7	90.5
12.320000	20	.4	.4	90.9
12.330000	23	.5	.5	91.4
12.340000	25	.5	.5	91.9
12.350000	22	.4	.4	92.3
12.360000	27	.5	.5	92.8
12.370000	18	.4	.4	93.2
12.380000	16	.3	.3	93.5

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
12.390000	15	.3	.3	93.8
12.400000	15	.3	.3	94.1
12.410000	22	.4	.4	94.6
12.420000	19	.4	.4	94.9
12.430000	25	.5	.5	95.4
12.440000	14	.3	.3	95.7
12.450000	14	.3	.3	96.0
12.460000	16	.3	.3	96.3
12.470000	9	.2	.2	96.5
12.480000	11	.2	.2	96.7
12.490000	15	.3	.3	97.0
12.500000	9	.2	.2	97.2
12.510000	12	.2	.2	97.4
12.520000	11	.2	.2	97.7
12.530000	10	.2	.2	97.9
12.540000	9	.2	.2	98.0
12.550000	7	.1	.1	98.2
12.560000	8	.2	.2	98.3
12.570000	6	.1	.1	98.5
12.580000	5	.1	.1	98.6
12.590000	8	.2	.2	98.7
12.600000	6	.1	.1	98.8
12.610000	7	.1	.1	99.0
12.620000	6	.1	.1	99.1
12.630000	6	.1	.1	99.2
12.640000	2	.0	.0	99.3
12.650000	1	.0	.0	99.3
12.660000	5	.1	.1	99.4
12.670000	3	.1	.1	99.4
12.680000	2	.0	.0	99.5
12.690000	4	.1	.1	99.6
12.700000	2	.0	.0	99.6
12.710000	3	.1	.1	99.7

Central Limit Theorem: Sampling Distributions of the Mean

G3 sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
12.730000	1	.0	.0	99.7
12.740000	1	.0	.0	99.7
12.750000	3	.1	.1	99.8
12.770000	2	.0	.0	99.8
12.780000	2	.0	.0	99.8
12.810000	1	.0	.0	99.9
12.820000	1	.0	.0	99.9
12.830000	1	.0	.0	99.9
12.870000	1	.0	.0	99.9
12.940000	2	.0	.0	100.0
12.960000	1	.0	.0	100.0
13.030000	1	.0	.0	100.0
Total	5000	100.0	100.0	

Absences sample mean, n=5

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid .000000	33	.7	.7	.7
.200000	6	.1	.1	.8
.400000	78	1.6	1.6	2.3
.600000	18	.4	.4	2.7
.800000	154	3.1	3.1	5.8
1.000000	42	.8	.8	6.6
1.200000	183	3.7	3.7	10.3
1.400000	73	1.5	1.5	11.7
1.600000	272	5.4	5.4	17.2
1.800000	87	1.7	1.7	18.9
2.000000	277	5.5	5.5	24.5
2.200000	104	2.1	2.1	26.5
2.400000	310	6.2	6.2	32.7
2.600000	112	2.2	2.2	35.0
2.800000	305	6.1	6.1	41.1
3.000000	118	2.4	2.4	43.4

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=5

	Frequency	Percent	Valid Percent	Cumulative Percent
3.200000	300	6.0	6.0	49.4
3.400000	126	2.5	2.5	52.0
3.600000	265	5.3	5.3	57.3
3.800000	116	2.3	2.3	59.6
4.000000	243	4.9	4.9	64.4
4.200000	100	2.0	2.0	66.4
4.400000	221	4.4	4.4	70.9
4.600000	103	2.1	2.1	72.9
4.800000	181	3.6	3.6	76.5
5.000000	97	1.9	1.9	78.5
5.200000	138	2.8	2.8	81.2
5.400000	64	1.3	1.3	82.5
5.600000	122	2.4	2.4	85.0
5.800000	61	1.2	1.2	86.2
6.000000	88	1.8	1.8	87.9
6.200000	34	.7	.7	88.6
6.400000	89	1.8	1.8	90.4
6.600000	54	1.1	1.1	91.5
6.800000	80	1.6	1.6	93.1
7.000000	37	.7	.7	93.8
7.200000	48	1.0	1.0	94.8
7.400000	16	.3	.3	95.1
7.600000	35	.7	.7	95.8
7.800000	17	.3	.3	96.1
8.000000	37	.7	.7	96.9
8.200000	12	.2	.2	97.1
8.400000	15	.3	.3	97.4
8.600000	10	.2	.2	97.6
8.800000	18	.4	.4	98.0
9.000000	7	.1	.1	98.1
9.200000	14	.3	.3	98.4
9.400000	8	.2	.2	98.6
9.600000	10	.2	.2	98.8

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=5

	Frequency	Percent	Valid Percent	Cumulative Percent
9.800000	5	.1	.1	98.9
10.000000	12	.2	.2	99.1
10.200000	4	.1	.1	99.2
10.400000	12	.2	.2	99.4
10.600000	1	.0	.0	99.4
10.800000	7	.1	.1	99.6
11.000000	1	.0	.0	99.6
11.200000	4	.1	.1	99.7
11.400000	2	.0	.0	99.7
11.600000	2	.0	.0	99.8
11.800000	2	.0	.0	99.8
12.000000	1	.0	.0	99.8
12.200000	1	.0	.0	99.8
12.600000	3	.1	.1	99.9
12.800000	2	.0	.0	99.9
13.200000	1	.0	.0	100.0
13.800000	1	.0	.0	100.0
14.800000	1	.0	.0	100.0
Total	5000	100.0	100.0	

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=10

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.200000	1	.0	.0	.0
	.300000	1	.0	.0	.0
	.400000	5	.1	.1	.1
	.500000	4	.1	.1	.2
	.600000	6	.1	.1	.3
	.700000	3	.1	.1	.4
	.800000	22	.4	.4	.8
	.900000	10	.2	.2	1.0
	1.000000	16	.3	.3	1.4
	1.100000	13	.3	.3	1.6
	1.200000	38	.8	.8	2.4
	1.300000	24	.5	.5	2.9
	1.400000	68	1.4	1.4	4.2
	1.500000	33	.7	.7	4.9
	1.600000	89	1.8	1.8	6.7
	1.700000	47	.9	.9	7.6
	1.800000	94	1.9	1.9	9.5
	1.900000	61	1.2	1.2	10.7
	2.000000	108	2.2	2.2	12.9
	2.100000	81	1.6	1.6	14.5
	2.200000	119	2.4	2.4	16.9
	2.300000	97	1.9	1.9	18.8
	2.400000	154	3.1	3.1	21.9
	2.500000	93	1.9	1.9	23.7
	2.600000	167	3.3	3.3	27.1
	2.700000	103	2.1	2.1	29.1
	2.800000	166	3.3	3.3	32.5
	2.900000	123	2.5	2.5	34.9
	3.000000	158	3.2	3.2	38.1
	3.100000	122	2.4	2.4	40.5
	3.200000	186	3.7	3.7	44.2
	3.300000	107	2.1	2.1	46.4
	3.400000	165	3.3	3.3	49.7

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=10

	Frequency	Percent	Valid Percent	Cumulative Percent
3.500000	117	2.3	2.3	52.0
3.600000	147	2.9	2.9	55.0
3.700000	115	2.3	2.3	57.3
3.800000	159	3.2	3.2	60.4
3.900000	95	1.9	1.9	62.3
4.000000	119	2.4	2.4	64.7
4.100000	98	2.0	2.0	66.7
4.200000	138	2.8	2.8	69.4
4.300000	81	1.6	1.6	71.1
4.400000	124	2.5	2.5	73.5
4.500000	79	1.6	1.6	75.1
4.600000	116	2.3	2.3	77.4
4.700000	80	1.6	1.6	79.0
4.800000	96	1.9	1.9	81.0
4.900000	60	1.2	1.2	82.2
5.000000	78	1.6	1.6	83.7
5.100000	61	1.2	1.2	84.9
5.200000	80	1.6	1.6	86.5
5.300000	41	.8	.8	87.4
5.400000	62	1.2	1.2	88.6
5.500000	56	1.1	1.1	89.7
5.600000	36	.7	.7	90.4
5.700000	43	.9	.9	91.3
5.800000	47	.9	.9	92.2
5.900000	30	.6	.6	92.8
6.000000	34	.7	.7	93.5
6.100000	23	.5	.5	94.0
6.200000	35	.7	.7	94.7
6.300000	24	.5	.5	95.2
6.400000	28	.6	.6	95.7
6.500000	23	.5	.5	96.2
6.600000	22	.4	.4	96.6
6.700000	16	.3	.3	96.9

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=10

	Frequency	Percent	Valid Percent	Cumulative Percent
6.800000	12	.2	.2	97.2
6.900000	15	.3	.3	97.5
7.000000	17	.3	.3	97.8
7.100000	13	.3	.3	98.1
7.200000	9	.2	.2	98.3
7.300000	10	.2	.2	98.5
7.400000	9	.2	.2	98.6
7.500000	6	.1	.1	98.8
7.600000	8	.2	.2	98.9
7.700000	4	.1	.1	99.0
7.800000	6	.1	.1	99.1
7.900000	3	.1	.1	99.2
8.000000	5	.1	.1	99.3
8.100000	2	.0	.0	99.3
8.200000	6	.1	.1	99.4
8.300000	1	.0	.0	99.5
8.400000	5	.1	.1	99.6
8.500000	5	.1	.1	99.7
8.600000	1	.0	.0	99.7
8.700000	2	.0	.0	99.7
8.800000	1	.0	.0	99.7
8.900000	2	.0	.0	99.8
9.000000	3	.1	.1	99.8
9.100000	1	.0	.0	99.9
9.200000	1	.0	.0	99.9
9.900000	3	.1	.1	99.9
10.100000	1	.0	.0	100.0
10.400000	1	.0	.0	100.0
11.400000	1	.0	.0	100.0
Total	5000	100.0	100.0	

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=30

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.000000	1	.0	.0	.0
	1.300000	2	.0	.0	.1
	1.333333	1	.0	.0	.1
	1.366667	1	.0	.0	.1
	1.400000	1	.0	.0	.1
	1.433333	2	.0	.0	.2
	1.466667	1	.0	.0	.2
	1.500000	2	.0	.0	.2
	1.533333	1	.0	.0	.2
	1.600000	1	.0	.0	.3
	1.633333	2	.0	.0	.3
	1.666667	4	.1	.1	.4
	1.700000	2	.0	.0	.4
	1.733333	7	.1	.1	.6
	1.766667	3	.1	.1	.6
	1.800000	2	.0	.0	.7
	1.833333	4	.1	.1	.7
	1.866667	2	.0	.0	.8
	1.900000	5	.1	.1	.9
	1.933333	4	.1	.1	1.0
	1.966667	10	.2	.2	1.2
	2.000000	11	.2	.2	1.4
	2.033333	14	.3	.3	1.7
	2.066667	13	.3	.3	1.9
	2.100000	15	.3	.3	2.2
	2.133333	16	.3	.3	2.5
	2.166667	17	.3	.3	2.9
	2.200000	18	.4	.4	3.2
	2.233333	27	.5	.5	3.8
	2.266667	14	.3	.3	4.1
	2.300000	33	.7	.7	4.7
	2.333333	18	.4	.4	5.1
	2.366667	16	.3	.3	5.4

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=30

	Frequency	Percent	Valid Percent	Cumulative Percent
2.400000	25	.5	.5	5.9
2.433333	30	.6	.6	6.5
2.466667	34	.7	.7	7.2
2.500000	29	.6	.6	7.8
2.533333	37	.7	.7	8.5
2.566667	43	.9	.9	9.4
2.600000	37	.7	.7	10.1
2.633333	28	.6	.6	10.7
2.666667	39	.8	.8	11.4
2.700000	47	.9	.9	12.4
2.733333	53	1.1	1.1	13.4
2.766667	45	.9	.9	14.3
2.800000	61	1.2	1.2	15.6
2.833333	65	1.3	1.3	16.9
2.866667	61	1.2	1.2	18.1
2.900000	61	1.2	1.2	19.3
2.933333	70	1.4	1.4	20.7
2.966667	61	1.2	1.2	21.9
3.000000	67	1.3	1.3	23.3
3.033333	62	1.2	1.2	24.5
3.066667	79	1.6	1.6	26.1
3.100000	73	1.5	1.5	27.5
3.133333	63	1.3	1.3	28.8
3.166667	82	1.6	1.6	30.4
3.200000	75	1.5	1.5	31.9
3.233333	88	1.8	1.8	33.7
3.266667	70	1.4	1.4	35.1
3.300000	86	1.7	1.7	36.8
3.333333	64	1.3	1.3	38.1
3.366667	84	1.7	1.7	39.8
3.400000	90	1.8	1.8	41.6
3.433333	89	1.8	1.8	43.4
3.466667	79	1.6	1.6	44.9

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=30

	Frequency	Percent	Valid Percent	Cumulative Percent
3.500000	82	1.6	1.6	46.6
3.533333	68	1.4	1.4	47.9
3.566667	68	1.4	1.4	49.3
3.600000	80	1.6	1.6	50.9
3.633333	85	1.7	1.7	52.6
3.666667	60	1.2	1.2	53.8
3.700000	85	1.7	1.7	55.5
3.733333	73	1.5	1.5	57.0
3.766667	78	1.6	1.6	58.5
3.800000	72	1.4	1.4	60.0
3.833333	58	1.2	1.2	61.1
3.866667	71	1.4	1.4	62.5
3.900000	70	1.4	1.4	63.9
3.933333	76	1.5	1.5	65.5
3.966667	79	1.6	1.6	67.0
4.000000	54	1.1	1.1	68.1
4.033333	66	1.3	1.3	69.4
4.066667	73	1.5	1.5	70.9
4.100000	66	1.3	1.3	72.2
4.133333	62	1.2	1.2	73.5
4.166667	54	1.1	1.1	74.5
4.200000	57	1.1	1.1	75.7
4.233333	62	1.2	1.2	76.9
4.266667	68	1.4	1.4	78.3
4.300000	52	1.0	1.0	79.3
4.333333	67	1.3	1.3	80.7
4.366667	45	.9	.9	81.6
4.400000	53	1.1	1.1	82.6
4.433333	43	.9	.9	83.5
4.466667	48	1.0	1.0	84.4
4.500000	30	.6	.6	85.0
4.533333	35	.7	.7	85.7
4.566667	27	.5	.5	86.3

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=30

	Frequency	Percent	Valid Percent	Cumulative Percent
4.600000	32	.6	.6	86.9
4.633333	35	.7	.7	87.6
4.666667	34	.7	.7	88.3
4.700000	28	.6	.6	88.9
4.733333	29	.6	.6	89.4
4.766667	24	.5	.5	89.9
4.800000	26	.5	.5	90.4
4.833333	36	.7	.7	91.2
4.866667	31	.6	.6	91.8
4.900000	27	.5	.5	92.3
4.933333	26	.5	.5	92.8
4.966667	13	.3	.3	93.1
5.000000	25	.5	.5	93.6
5.033333	12	.2	.2	93.8
5.066667	15	.3	.3	94.1
5.100000	18	.4	.4	94.5
5.133333	12	.2	.2	94.7
5.166667	24	.5	.5	95.2
5.200000	20	.4	.4	95.6
5.233333	18	.4	.4	96.0
5.266667	15	.3	.3	96.3
5.300000	9	.2	.2	96.5
5.333333	11	.2	.2	96.7
5.366667	15	.3	.3	97.0
5.400000	14	.3	.3	97.3
5.433333	14	.3	.3	97.5
5.466667	11	.2	.2	97.8
5.500000	5	.1	.1	97.9
5.533333	4	.1	.1	97.9
5.566667	11	.2	.2	98.2
5.600000	3	.1	.1	98.2
5.633333	8	.2	.2	98.4
5.666667	4	.1	.1	98.5

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=30

	Frequency	Percent	Valid Percent	Cumulative Percent
5.700000	5	.1	.1	98.6
5.733333	3	.1	.1	98.6
5.766667	8	.2	.2	98.8
5.800000	6	.1	.1	98.9
5.833333	6	.1	.1	99.0
5.866667	7	.1	.1	99.2
5.900000	3	.1	.1	99.2
5.933333	2	.0	.0	99.3
5.966667	2	.0	.0	99.3
6.000000	2	.0	.0	99.3
6.033333	3	.1	.1	99.4
6.066667	1	.0	.0	99.4
6.100000	2	.0	.0	99.5
6.133333	2	.0	.0	99.5
6.166667	2	.0	.0	99.5
6.200000	1	.0	.0	99.6
6.233333	1	.0	.0	99.6
6.266667	3	.1	.1	99.6
6.300000	2	.0	.0	99.7
6.333333	2	.0	.0	99.7
6.366667	2	.0	.0	99.8
6.400000	1	.0	.0	99.8
6.433333	3	.1	.1	99.8
6.466667	2	.0	.0	99.9
6.566667	1	.0	.0	99.9
6.733333	1	.0	.0	99.9
6.800000	1	.0	.0	99.9
6.833333	1	.0	.0	100.0
6.900000	1	.0	.0	100.0
6.933333	1	.0	.0	100.0
Total	5000	100.0	100.0	

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=50

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.420000	1	.0	.0	.0
	1.720000	1	.0	.0	.0
	1.780000	1	.0	.0	.1
	1.800000	1	.0	.0	.1
	1.840000	2	.0	.0	.1
	1.880000	3	.1	.1	.2
	1.940000	1	.0	.0	.2
	1.960000	1	.0	.0	.2
	1.980000	1	.0	.0	.2
	2.020000	1	.0	.0	.3
	2.040000	1	.0	.0	.3
	2.100000	1	.0	.0	.3
	2.140000	7	.1	.1	.4
	2.160000	4	.1	.1	.5
	2.180000	3	.1	.1	.6
	2.200000	5	.1	.1	.7
	2.220000	3	.1	.1	.7
	2.240000	5	.1	.1	.8
	2.260000	8	.2	.2	1.0
	2.280000	6	.1	.1	1.1
	2.300000	5	.1	.1	1.2
	2.320000	3	.1	.1	1.3
	2.340000	5	.1	.1	1.4
	2.360000	6	.1	.1	1.5
	2.380000	7	.1	.1	1.6
	2.400000	14	.3	.3	1.9
	2.420000	14	.3	.3	2.2
	2.440000	8	.2	.2	2.4
	2.460000	11	.2	.2	2.6
	2.480000	9	.2	.2	2.8
	2.500000	10	.2	.2	3.0
	2.520000	16	.3	.3	3.3
	2.540000	15	.3	.3	3.6

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=50

	Frequency	Percent	Valid Percent	Cumulative Percent
2.560000	14	.3	.3	3.9
2.580000	10	.2	.2	4.1
2.600000	22	.4	.4	4.5
2.620000	22	.4	.4	4.9
2.640000	19	.4	.4	5.3
2.660000	12	.2	.2	5.6
2.680000	23	.5	.5	6.0
2.700000	23	.5	.5	6.5
2.720000	17	.3	.3	6.8
2.740000	25	.5	.5	7.3
2.760000	17	.3	.3	7.7
2.780000	30	.6	.6	8.3
2.800000	32	.6	.6	8.9
2.820000	40	.8	.8	9.7
2.840000	34	.7	.7	10.4
2.860000	29	.6	.6	11.0
2.880000	31	.6	.6	11.6
2.900000	24	.5	.5	12.1
2.920000	37	.7	.7	12.8
2.940000	28	.6	.6	13.4
2.960000	38	.8	.8	14.1
2.980000	34	.7	.7	14.8
3.000000	37	.7	.7	15.5
3.020000	33	.7	.7	16.2
3.040000	45	.9	.9	17.1
3.060000	49	1.0	1.0	18.1
3.080000	44	.9	.9	19.0
3.100000	38	.8	.8	19.7
3.120000	34	.7	.7	20.4
3.140000	48	1.0	1.0	21.4
3.160000	49	1.0	1.0	22.3
3.180000	55	1.1	1.1	23.4
3.200000	46	.9	.9	24.4

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=50

	Frequency	Percent	Valid Percent	Cumulative Percent
3.220000	48	1.0	1.0	25.3
3.240000	50	1.0	1.0	26.3
3.260000	58	1.2	1.2	27.5
3.280000	61	1.2	1.2	28.7
3.300000	71	1.4	1.4	30.1
3.320000	53	1.1	1.1	31.2
3.340000	59	1.2	1.2	32.4
3.360000	61	1.2	1.2	33.6
3.380000	59	1.2	1.2	34.8
3.400000	59	1.2	1.2	35.9
3.420000	60	1.2	1.2	37.1
3.440000	62	1.2	1.2	38.4
3.460000	71	1.4	1.4	39.8
3.480000	60	1.2	1.2	41.0
3.500000	76	1.5	1.5	42.5
3.520000	50	1.0	1.0	43.5
3.540000	53	1.1	1.1	44.6
3.560000	59	1.2	1.2	45.8
3.580000	81	1.6	1.6	47.4
3.600000	68	1.4	1.4	48.7
3.620000	60	1.2	1.2	49.9
3.640000	53	1.1	1.1	51.0
3.660000	64	1.3	1.3	52.3
3.680000	62	1.2	1.2	53.5
3.700000	63	1.3	1.3	54.8
3.720000	65	1.3	1.3	56.1
3.740000	47	.9	.9	57.0
3.760000	63	1.3	1.3	58.3
3.780000	74	1.5	1.5	59.8
3.800000	55	1.1	1.1	60.9
3.820000	51	1.0	1.0	61.9
3.840000	54	1.1	1.1	63.0
3.860000	58	1.2	1.2	64.1

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=50

	Frequency	Percent	Valid Percent	Cumulative Percent
3.880000	58	1.2	1.2	65.3
3.900000	60	1.2	1.2	66.5
3.920000	46	.9	.9	67.4
3.940000	56	1.1	1.1	68.5
3.960000	52	1.0	1.0	69.6
3.980000	57	1.1	1.1	70.7
4.000000	50	1.0	1.0	71.7
4.020000	43	.9	.9	72.6
4.040000	55	1.1	1.1	73.7
4.060000	48	1.0	1.0	74.6
4.080000	30	.6	.6	75.2
4.100000	55	1.1	1.1	76.3
4.120000	44	.9	.9	77.2
4.140000	38	.8	.8	78.0
4.160000	41	.8	.8	78.8
4.180000	34	.7	.7	79.5
4.200000	34	.7	.7	80.1
4.220000	33	.7	.7	80.8
4.240000	31	.6	.6	81.4
4.260000	38	.8	.8	82.2
4.280000	37	.7	.7	82.9
4.300000	38	.8	.8	83.7
4.320000	35	.7	.7	84.4
4.340000	30	.6	.6	85.0
4.360000	22	.4	.4	85.4
4.380000	30	.6	.6	86.0
4.400000	25	.5	.5	86.5
4.420000	30	.6	.6	87.1
4.440000	29	.6	.6	87.7
4.460000	28	.6	.6	88.3
4.480000	34	.7	.7	88.9
4.500000	23	.5	.5	89.4
4.520000	23	.5	.5	89.9

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=50

	Frequency	Percent	Valid Percent	Cumulative Percent
4.540000	29	.6	.6	90.4
4.560000	21	.4	.4	90.9
4.580000	21	.4	.4	91.3
4.600000	17	.3	.3	91.6
4.620000	27	.5	.5	92.2
4.640000	21	.4	.4	92.6
4.660000	20	.4	.4	93.0
4.680000	16	.3	.3	93.3
4.700000	17	.3	.3	93.6
4.720000	11	.2	.2	93.9
4.740000	15	.3	.3	94.2
4.760000	9	.2	.2	94.3
4.780000	13	.3	.3	94.6
4.800000	17	.3	.3	94.9
4.820000	17	.3	.3	95.3
4.840000	11	.2	.2	95.5
4.860000	14	.3	.3	95.8
4.880000	8	.2	.2	95.9
4.900000	7	.1	.1	96.1
4.920000	6	.1	.1	96.2
4.940000	16	.3	.3	96.5
4.960000	8	.2	.2	96.7
4.980000	9	.2	.2	96.9
5.000000	5	.1	.1	97.0
5.020000	8	.2	.2	97.1
5.040000	9	.2	.2	97.3
5.060000	6	.1	.1	97.4
5.080000	6	.1	.1	97.5
5.100000	3	.1	.1	97.6
5.120000	9	.2	.2	97.8
5.140000	10	.2	.2	98.0
5.160000	7	.1	.1	98.1
5.180000	2	.0	.0	98.2

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=50

	Frequency	Percent	Valid Percent	Cumulative Percent
5.200000	5	.1	.1	98.3
5.220000	8	.2	.2	98.4
5.240000	6	.1	.1	98.5
5.260000	3	.1	.1	98.6
5.280000	7	.1	.1	98.7
5.300000	6	.1	.1	98.9
5.320000	5	.1	.1	99.0
5.340000	5	.1	.1	99.1
5.360000	3	.1	.1	99.1
5.380000	3	.1	.1	99.2
5.400000	4	.1	.1	99.3
5.420000	5	.1	.1	99.4
5.460000	1	.0	.0	99.4
5.480000	3	.1	.1	99.4
5.500000	4	.1	.1	99.5
5.520000	3	.1	.1	99.6
5.540000	4	.1	.1	99.7
5.560000	1	.0	.0	99.7
5.580000	1	.0	.0	99.7
5.660000	1	.0	.0	99.7
5.700000	2	.0	.0	99.8
5.720000	4	.1	.1	99.8
5.740000	2	.0	.0	99.9
5.760000	2	.0	.0	99.9
5.840000	1	.0	.0	99.9
6.080000	1	.0	.0	100.0
6.160000	1	.0	.0	100.0
6.180000	1	.0	.0	100.0
Total	5000	100.0	100.0	

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=100

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.120000	1	.0	.0	.0
	2.140000	1	.0	.0	.0
	2.230000	1	.0	.0	.1
	2.320000	1	.0	.0	.1
	2.340000	1	.0	.0	.1
	2.350000	2	.0	.0	.1
	2.360000	2	.0	.0	.2
	2.410000	1	.0	.0	.2
	2.420000	1	.0	.0	.2
	2.450000	1	.0	.0	.2
	2.470000	1	.0	.0	.3
	2.490000	3	.1	.1	.3
	2.500000	3	.1	.1	.4
	2.510000	3	.1	.1	.4
	2.520000	3	.1	.1	.5
	2.530000	1	.0	.0	.5
	2.540000	3	.1	.1	.6
	2.550000	1	.0	.0	.6
	2.570000	3	.1	.1	.7
	2.580000	3	.1	.1	.7
	2.590000	3	.1	.1	.8
	2.600000	2	.0	.0	.8
	2.610000	2	.0	.0	.9
	2.620000	4	.1	.1	.9
	2.630000	4	.1	.1	1.0
	2.640000	6	.1	.1	1.1
	2.650000	3	.1	.1	1.2
	2.660000	4	.1	.1	1.3
	2.670000	2	.0	.0	1.3
	2.680000	4	.1	.1	1.4
	2.690000	6	.1	.1	1.5
	2.700000	4	.1	.1	1.6
2.710000	3	.1	.1	1.7	

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
2.720000	5	.1	.1	1.8
2.730000	5	.1	.1	1.9
2.740000	6	.1	.1	2.0
2.750000	6	.1	.1	2.1
2.760000	11	.2	.2	2.3
2.770000	5	.1	.1	2.4
2.780000	5	.1	.1	2.5
2.790000	6	.1	.1	2.6
2.800000	6	.1	.1	2.8
2.810000	10	.2	.2	3.0
2.820000	10	.2	.2	3.2
2.830000	11	.2	.2	3.4
2.840000	9	.2	.2	3.6
2.850000	6	.1	.1	3.7
2.860000	12	.2	.2	3.9
2.870000	6	.1	.1	4.0
2.880000	9	.2	.2	4.2
2.890000	13	.3	.3	4.5
2.900000	10	.2	.2	4.7
2.910000	11	.2	.2	4.9
2.920000	11	.2	.2	5.1
2.930000	10	.2	.2	5.3
2.940000	10	.2	.2	5.5
2.950000	16	.3	.3	5.8
2.960000	15	.3	.3	6.1
2.970000	15	.3	.3	6.4
2.980000	12	.2	.2	6.7
2.990000	12	.2	.2	6.9
3.000000	24	.5	.5	7.4
3.010000	14	.3	.3	7.7
3.020000	21	.4	.4	8.1
3.030000	18	.4	.4	8.5
3.040000	22	.4	.4	8.9

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
3.050000	21	.4	.4	9.3
3.060000	32	.6	.6	10.0
3.070000	11	.2	.2	10.2
3.080000	20	.4	.4	10.6
3.090000	18	.4	.4	10.9
3.100000	30	.6	.6	11.5
3.110000	23	.5	.5	12.0
3.120000	29	.6	.6	12.6
3.130000	17	.3	.3	12.9
3.140000	31	.6	.6	13.5
3.150000	23	.5	.5	14.0
3.160000	19	.4	.4	14.4
3.170000	30	.6	.6	15.0
3.180000	27	.5	.5	15.5
3.190000	21	.4	.4	15.9
3.200000	20	.4	.4	16.3
3.210000	25	.5	.5	16.8
3.220000	35	.7	.7	17.5
3.230000	39	.8	.8	18.3
3.240000	29	.6	.6	18.9
3.250000	39	.8	.8	19.7
3.260000	37	.7	.7	20.4
3.270000	32	.6	.6	21.1
3.280000	38	.8	.8	21.8
3.290000	30	.6	.6	22.4
3.300000	35	.7	.7	23.1
3.310000	19	.4	.4	23.5
3.320000	47	.9	.9	24.4
3.330000	34	.7	.7	25.1
3.340000	34	.7	.7	25.8
3.350000	32	.6	.6	26.4
3.360000	52	1.0	1.0	27.5
3.370000	44	.9	.9	28.4

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
3.380000	41	.8	.8	29.2
3.390000	32	.6	.6	29.8
3.400000	38	.8	.8	30.6
3.410000	44	.9	.9	31.5
3.420000	33	.7	.7	32.1
3.430000	49	1.0	1.0	33.1
3.440000	36	.7	.7	33.8
3.450000	44	.9	.9	34.7
3.460000	39	.8	.8	35.5
3.470000	45	.9	.9	36.4
3.480000	34	.7	.7	37.1
3.490000	44	.9	.9	37.9
3.500000	41	.8	.8	38.8
3.510000	45	.9	.9	39.7
3.520000	44	.9	.9	40.5
3.530000	51	1.0	1.0	41.6
3.540000	51	1.0	1.0	42.6
3.550000	38	.8	.8	43.3
3.560000	39	.8	.8	44.1
3.570000	41	.8	.8	44.9
3.580000	37	.7	.7	45.7
3.590000	40	.8	.8	46.5
3.600000	26	.5	.5	47.0
3.610000	43	.9	.9	47.9
3.620000	44	.9	.9	48.7
3.630000	49	1.0	1.0	49.7
3.640000	33	.7	.7	50.4
3.650000	41	.8	.8	51.2
3.660000	37	.7	.7	51.9
3.670000	37	.7	.7	52.7
3.680000	28	.6	.6	53.2
3.690000	56	1.1	1.1	54.4
3.700000	53	1.1	1.1	55.4

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
3.710000	43	.9	.9	56.3
3.720000	43	.9	.9	57.1
3.730000	36	.7	.7	57.9
3.740000	44	.9	.9	58.7
3.750000	47	.9	.9	59.7
3.760000	34	.7	.7	60.4
3.770000	39	.8	.8	61.1
3.780000	38	.8	.8	61.9
3.790000	32	.6	.6	62.5
3.800000	34	.7	.7	63.2
3.810000	40	.8	.8	64.0
3.820000	40	.8	.8	64.8
3.830000	34	.7	.7	65.5
3.840000	45	.9	.9	66.4
3.850000	38	.8	.8	67.2
3.860000	42	.8	.8	68.0
3.870000	38	.8	.8	68.8
3.880000	31	.6	.6	69.4
3.890000	41	.8	.8	70.2
3.900000	34	.7	.7	70.9
3.910000	24	.5	.5	71.4
3.920000	35	.7	.7	72.1
3.930000	46	.9	.9	73.0
3.940000	26	.5	.5	73.5
3.950000	43	.9	.9	74.4
3.960000	47	.9	.9	75.3
3.970000	23	.5	.5	75.8
3.980000	22	.4	.4	76.2
3.990000	23	.5	.5	76.7
4.000000	30	.6	.6	77.3
4.010000	37	.7	.7	78.0
4.020000	21	.4	.4	78.4
4.030000	38	.8	.8	79.2

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
4.040000	28	.6	.6	79.7
4.050000	31	.6	.6	80.4
4.060000	24	.5	.5	80.8
4.070000	26	.5	.5	81.4
4.080000	35	.7	.7	82.1
4.090000	24	.5	.5	82.5
4.100000	24	.5	.5	83.0
4.110000	24	.5	.5	83.5
4.120000	23	.5	.5	84.0
4.130000	25	.5	.5	84.5
4.140000	26	.5	.5	85.0
4.150000	13	.3	.3	85.2
4.160000	23	.5	.5	85.7
4.170000	27	.5	.5	86.2
4.180000	19	.4	.4	86.6
4.190000	24	.5	.5	87.1
4.200000	24	.5	.5	87.6
4.210000	22	.4	.4	88.0
4.220000	13	.3	.3	88.3
4.230000	11	.2	.2	88.5
4.240000	14	.3	.3	88.8
4.250000	16	.3	.3	89.1
4.260000	17	.3	.3	89.4
4.270000	20	.4	.4	89.8
4.280000	20	.4	.4	90.2
4.290000	17	.3	.3	90.6
4.300000	16	.3	.3	90.9
4.310000	18	.4	.4	91.3
4.320000	20	.4	.4	91.7
4.330000	19	.4	.4	92.0
4.340000	17	.3	.3	92.4
4.350000	12	.2	.2	92.6
4.360000	14	.3	.3	92.9

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
4.370000	19	.4	.4	93.3
4.380000	10	.2	.2	93.5
4.390000	12	.2	.2	93.7
4.400000	11	.2	.2	93.9
4.410000	8	.2	.2	94.1
4.420000	9	.2	.2	94.3
4.430000	12	.2	.2	94.5
4.440000	16	.3	.3	94.8
4.450000	7	.1	.1	95.0
4.460000	13	.3	.3	95.2
4.470000	8	.2	.2	95.4
4.480000	10	.2	.2	95.6
4.490000	6	.1	.1	95.7
4.500000	12	.2	.2	96.0
4.510000	9	.2	.2	96.1
4.520000	2	.0	.0	96.2
4.530000	9	.2	.2	96.4
4.540000	8	.2	.2	96.5
4.550000	4	.1	.1	96.6
4.560000	7	.1	.1	96.7
4.570000	3	.1	.1	96.8
4.580000	7	.1	.1	96.9
4.590000	4	.1	.1	97.0
4.600000	4	.1	.1	97.1
4.610000	4	.1	.1	97.2
4.620000	9	.2	.2	97.4
4.630000	7	.1	.1	97.5
4.640000	10	.2	.2	97.7
4.650000	4	.1	.1	97.8
4.660000	5	.1	.1	97.9
4.670000	4	.1	.1	98.0
4.680000	4	.1	.1	98.0
4.690000	4	.1	.1	98.1

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
4.700000	3	.1	.1	98.2
4.710000	5	.1	.1	98.3
4.720000	4	.1	.1	98.4
4.730000	5	.1	.1	98.5
4.740000	6	.1	.1	98.6
4.750000	4	.1	.1	98.7
4.760000	2	.0	.0	98.7
4.770000	4	.1	.1	98.8
4.780000	3	.1	.1	98.8
4.790000	3	.1	.1	98.9
4.800000	2	.0	.0	98.9
4.810000	2	.0	.0	99.0
4.820000	3	.1	.1	99.0
4.840000	4	.1	.1	99.1
4.850000	1	.0	.0	99.1
4.860000	2	.0	.0	99.2
4.870000	3	.1	.1	99.2
4.880000	3	.1	.1	99.3
4.890000	1	.0	.0	99.3
4.900000	2	.0	.0	99.4
4.910000	1	.0	.0	99.4
4.920000	2	.0	.0	99.4
4.930000	1	.0	.0	99.4
4.940000	2	.0	.0	99.5
4.950000	1	.0	.0	99.5
4.960000	3	.1	.1	99.6
4.970000	1	.0	.0	99.6
4.990000	2	.0	.0	99.6
5.000000	1	.0	.0	99.6
5.020000	1	.0	.0	99.7
5.040000	1	.0	.0	99.7
5.050000	1	.0	.0	99.7
5.060000	1	.0	.0	99.7

Central Limit Theorem: Sampling Distributions of the Mean

Absences sample mean, n=100

	Frequency	Percent	Valid Percent	Cumulative Percent
5.070000	1	.0	.0	99.7
5.090000	2	.0	.0	99.8
5.110000	2	.0	.0	99.8
5.130000	1	.0	.0	99.8
5.140000	1	.0	.0	99.9
5.150000	2	.0	.0	99.9
5.160000	2	.0	.0	99.9
5.230000	1	.0	.0	100.0
5.320000	1	.0	.0	100.0
5.430000	1	.0	.0	100.0
Total	5000	100.0	100.0	

EXAMINE VARIABLES=

g3_mean_n5 g3_mean_n10 g3_mean_n30 g3_mean_n50 g3_mean_n100

/PLOT HISTOGRAM NPLOT

/COMPARE GROUPS

/STATISTICS DESCRIPTIVES

/CINTERVAL 95

/MISSING LISTWISE

/NOTOTAL.

Explore

Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
G3 sample mean, n=5	5000	100.0%	0	0.0%	5000	100.0%
G3 sample mean, n=10	5000	100.0%	0	0.0%	5000	100.0%
G3 sample mean, n=30	5000	100.0%	0	0.0%	5000	100.0%
G3 sample mean, n=50	5000	100.0%	0	0.0%	5000	100.0%
G3 sample mean, n=100	5000	100.0%	0	0.0%	5000	100.0%

Central Limit Theorem: Sampling Distributions of the Mean

Descriptives

		Statistic	Std. Error	
G3 sample mean, n=5	Mean	11.91736000	.020593954	
	95% Confidence Interval for Mean	Lower Bound	11.87698682	
		Upper Bound	11.95773318	
	5% Trimmed Mean	11.95048889		
	Median	12.00000000		
	Variance	2.121		
	Std. Deviation	1.456212464		
	Minimum	5.200000		
	Maximum	16.600000		
	Range	11.400000		
	Interquartile Range	2.000000		
	Skewness	-.376	.035	
	Kurtosis	.534	.069	
G3 sample mean, n=10	Mean	11.90094000	.014314510	
	95% Confidence Interval for Mean	Lower Bound	11.87287728	
		Upper Bound	11.92900272	
	5% Trimmed Mean	11.92377778		
	Median	11.90000000		
	Variance	1.025		
	Std. Deviation	1.012188728		
	Minimum	7.600000		
	Maximum	15.000000		
	Range	7.400000		
	Interquartile Range	1.300000		
	Skewness	-.345	.035	
	Kurtosis	.271	.069	
G3 sample mean, n=30	Mean	11.90086000	.008319041	
	95% Confidence Interval for Mean	Lower Bound	11.88455103	
		Upper Bound	11.91716897	
	5% Trimmed Mean	11.90725185		
	Median	11.90000000		
	Variance	.346		
	Std. Deviation	.588245055		

Central Limit Theorem: Sampling Distributions of the Mean

Descriptives

		Statistic	Std. Error	
	Minimum	9.566667		
	Maximum	13.933333		
	Range	4.366667		
	Interquartile Range	.800000		
	Skewness	-.169	.035	
	Kurtosis	.114	.069	
G3 sample mean, n=50	Mean	11.91424400	.006494066	
	95% Confidence Interval for Mean	Lower Bound	11.90151278	
		Upper Bound	11.92697522	
	5% Trimmed Mean	11.91687556		
	Median	11.92000000		
	Variance	.211		
	Std. Deviation	.459199827		
	Minimum	9.980000		
	Maximum	13.440000		
	Range	3.460000		
	Interquartile Range	.620000		
	Skewness	-.090	.035	
	Kurtosis	-.019	.069	
G3 sample mean, n=100	Mean	11.90284400	.004579507	
	95% Confidence Interval for Mean	Lower Bound	11.89386616	
		Upper Bound	11.91182184	
	5% Trimmed Mean	11.90576222		
	Median	11.91000000		
	Variance	.105		
	Std. Deviation	.323820079		
	Minimum	10.760000		
	Maximum	13.030000		
	Range	2.270000		
	Interquartile Range	.430000		
	Skewness	-.134	.035	
	Kurtosis	-.004	.069	

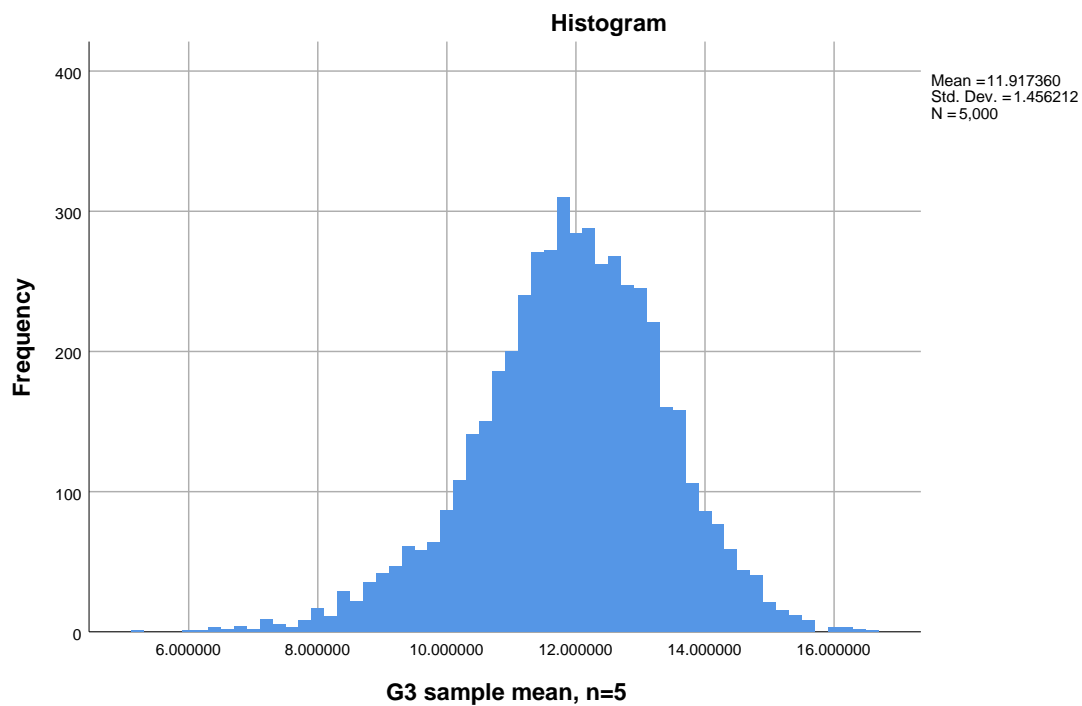
Central Limit Theorem: Sampling Distributions of the Mean

Tests of Normality

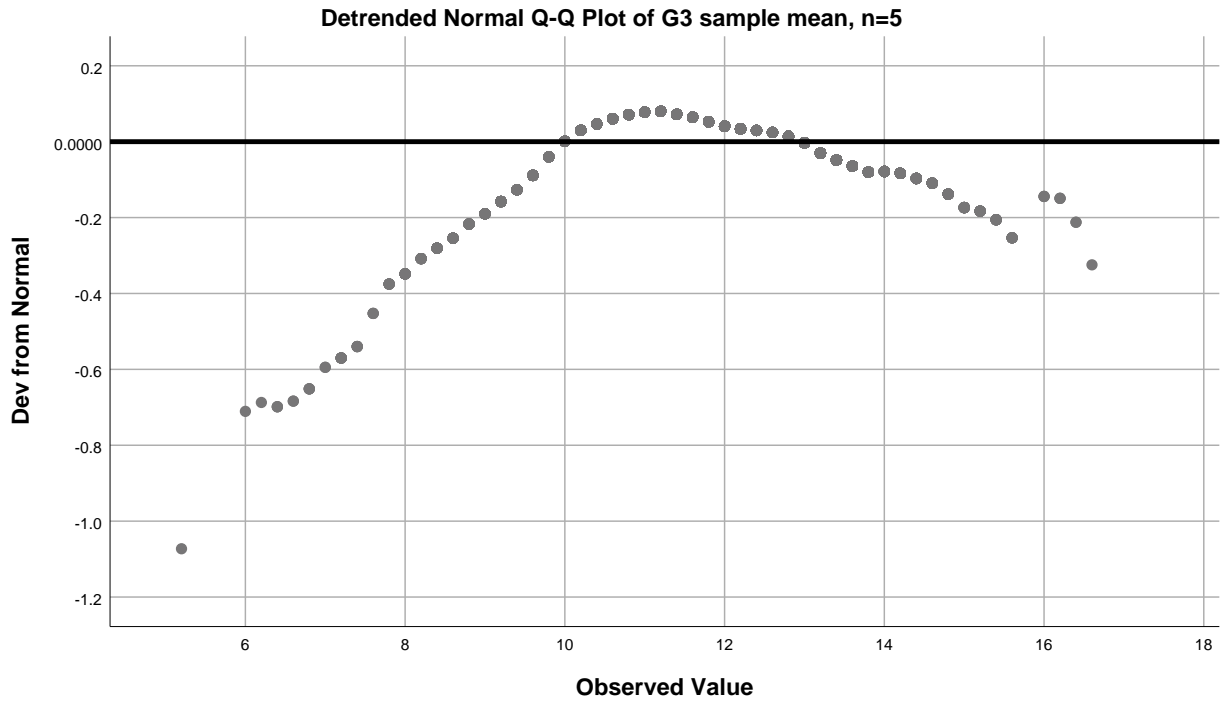
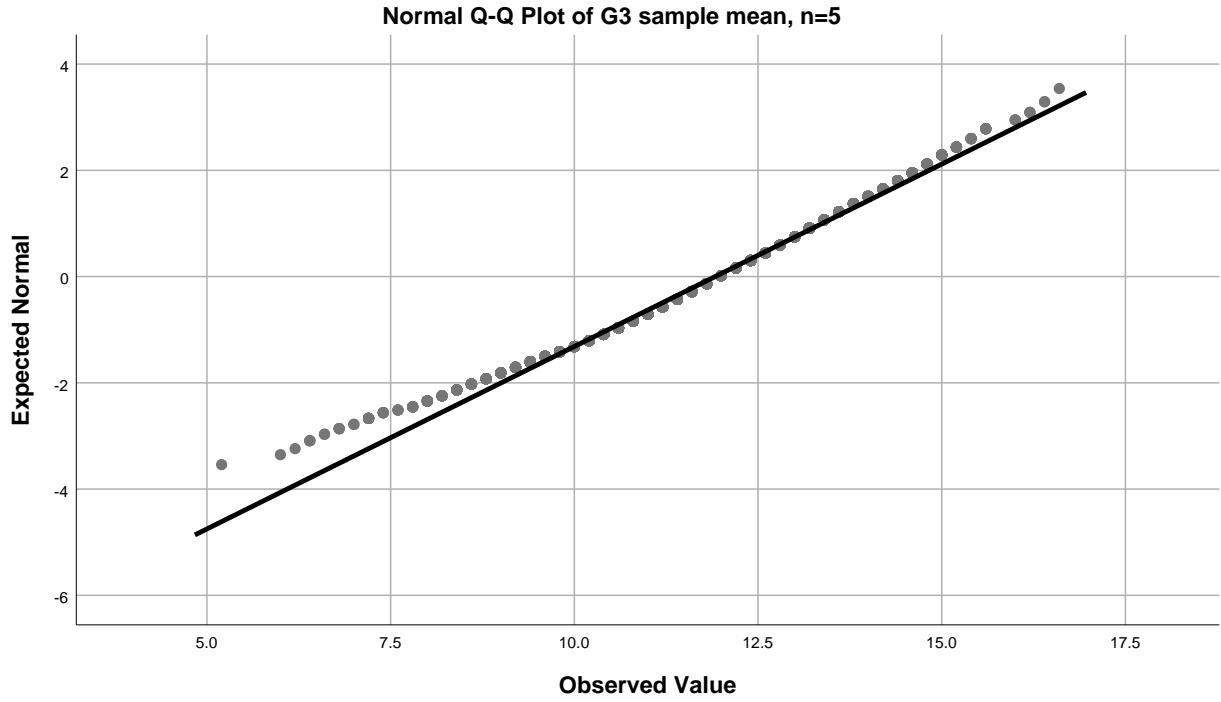
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
G3 sample mean, n=5	.054	5000	.000	.990	5000	.000
G3 sample mean, n=10	.043	5000	.000	.993	5000	.000
G3 sample mean, n=30	.026	5000	.000	.998	5000	.000
G3 sample mean, n=50	.018	5000	.001	.999	5000	.035
G3 sample mean, n=100	.018	5000	.001	.999	5000	.001

a. Lilliefors Significance Correction

G3 sample mean, n=5

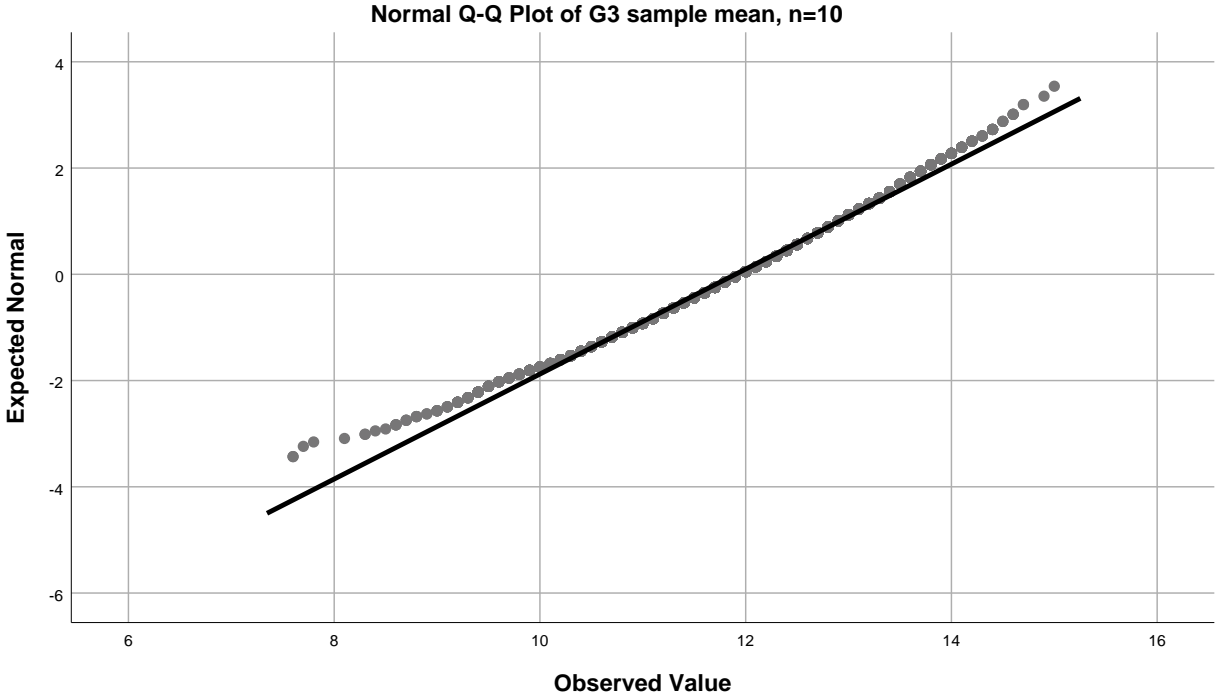
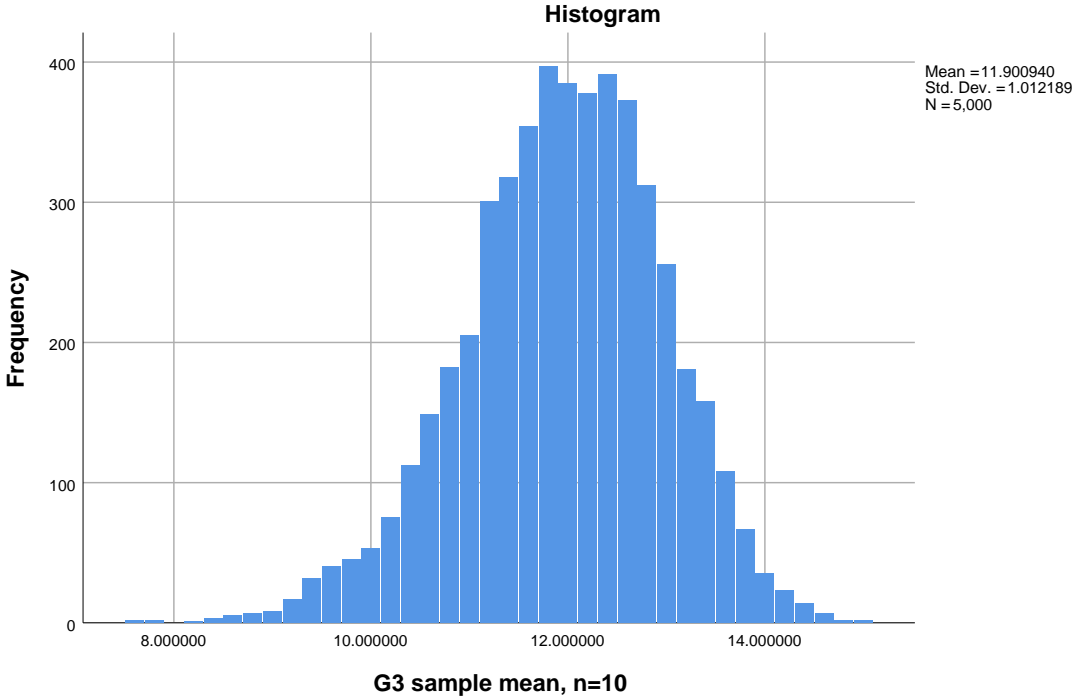


Central Limit Theorem: Sampling Distributions of the Mean

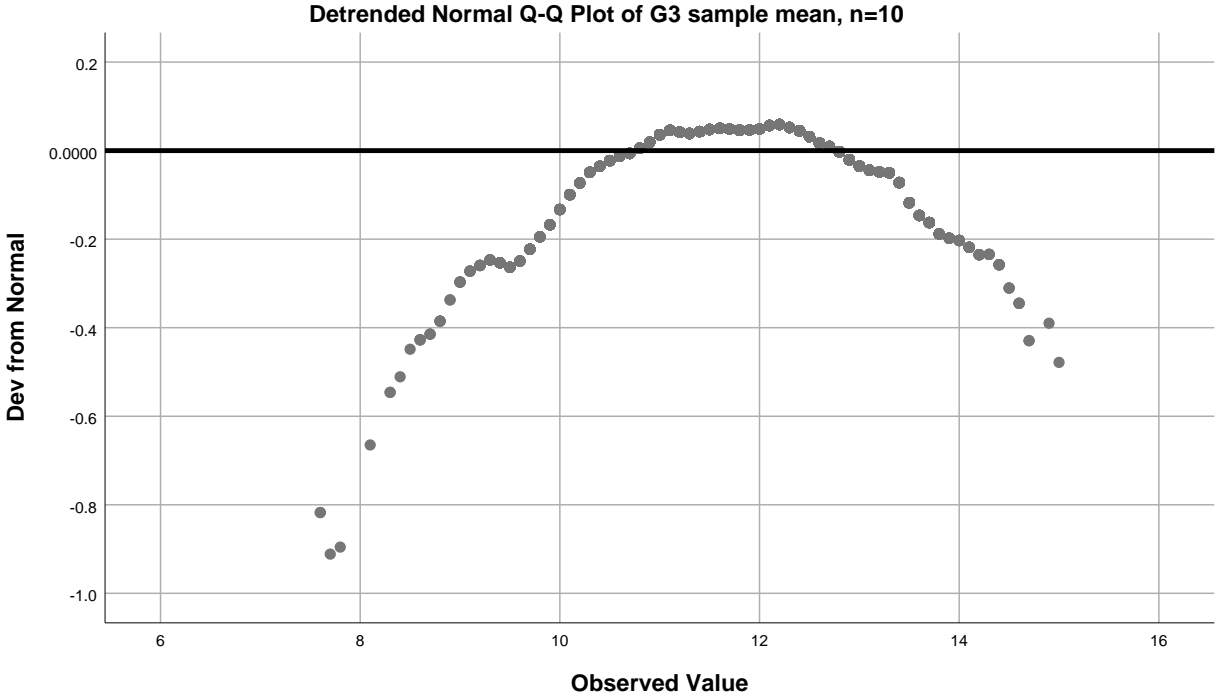


G3 sample mean, n=10

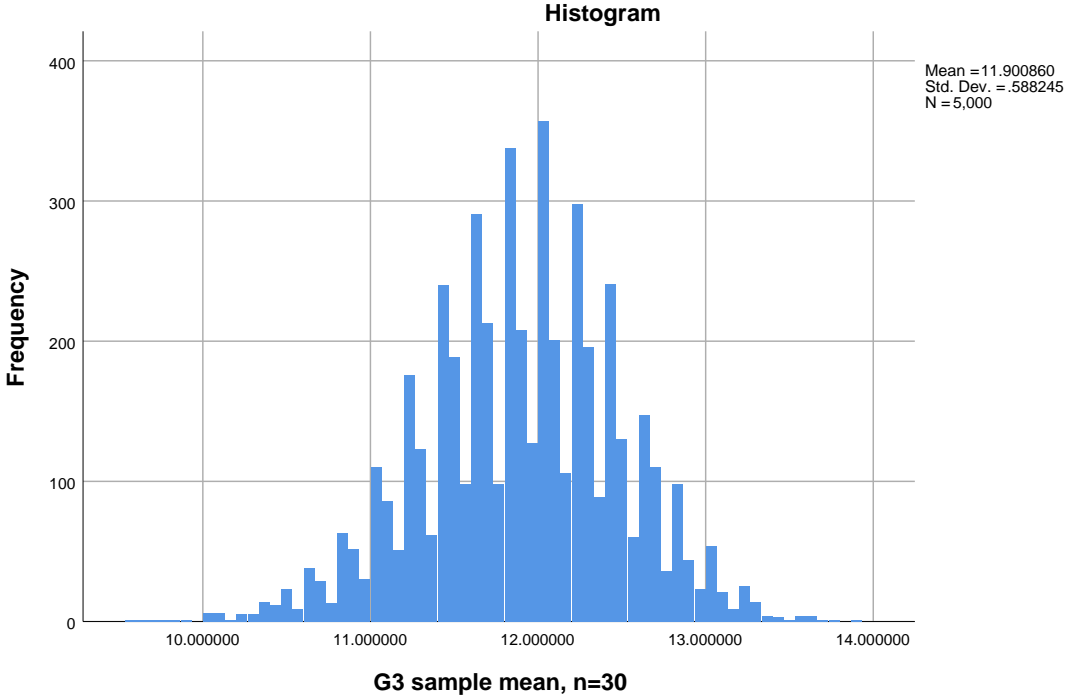
Central Limit Theorem: Sampling Distributions of the Mean



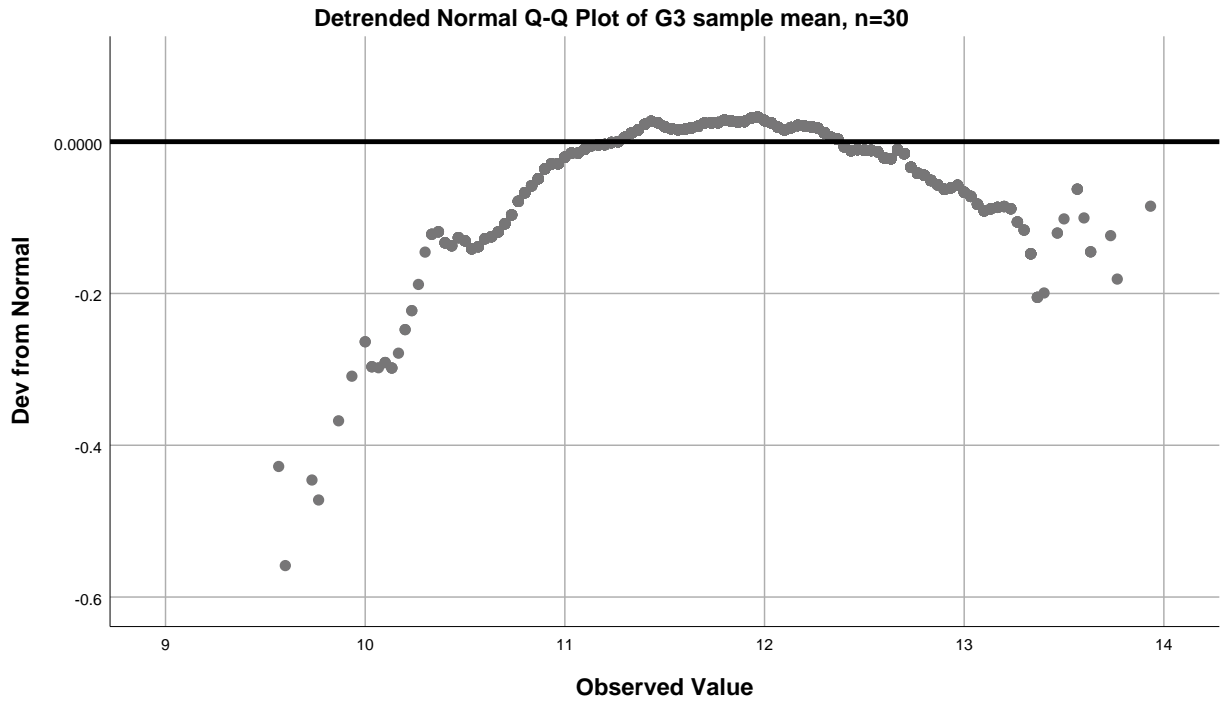
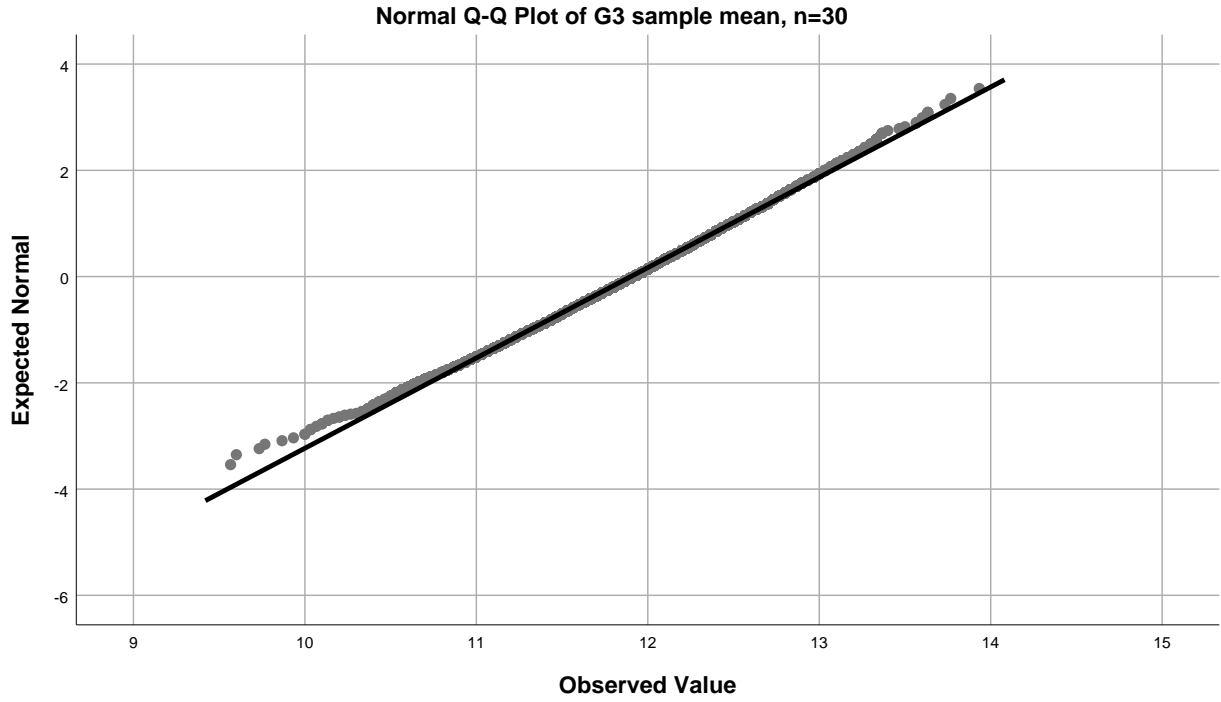
Central Limit Theorem: Sampling Distributions of the Mean



G3 sample mean, n=30

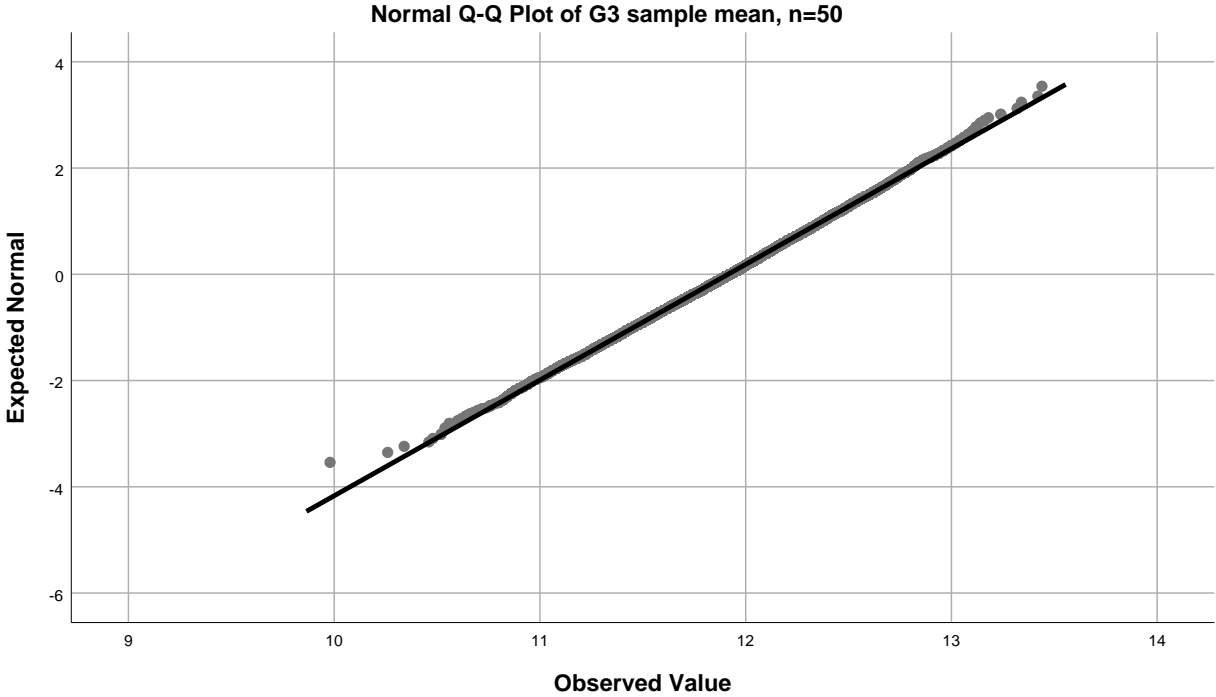
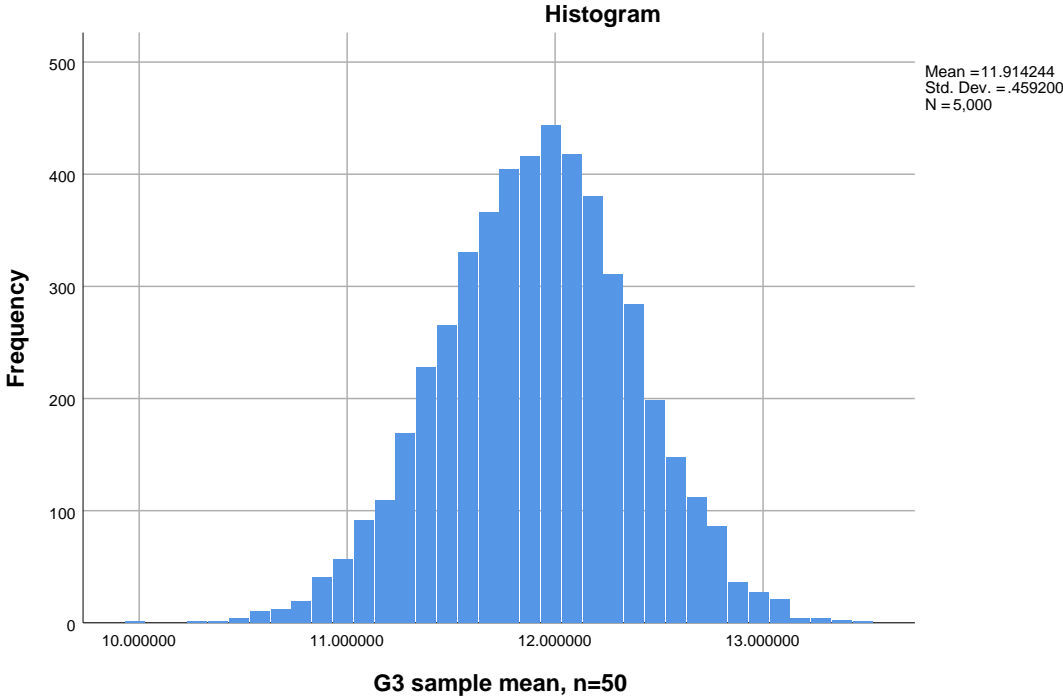


Central Limit Theorem: Sampling Distributions of the Mean

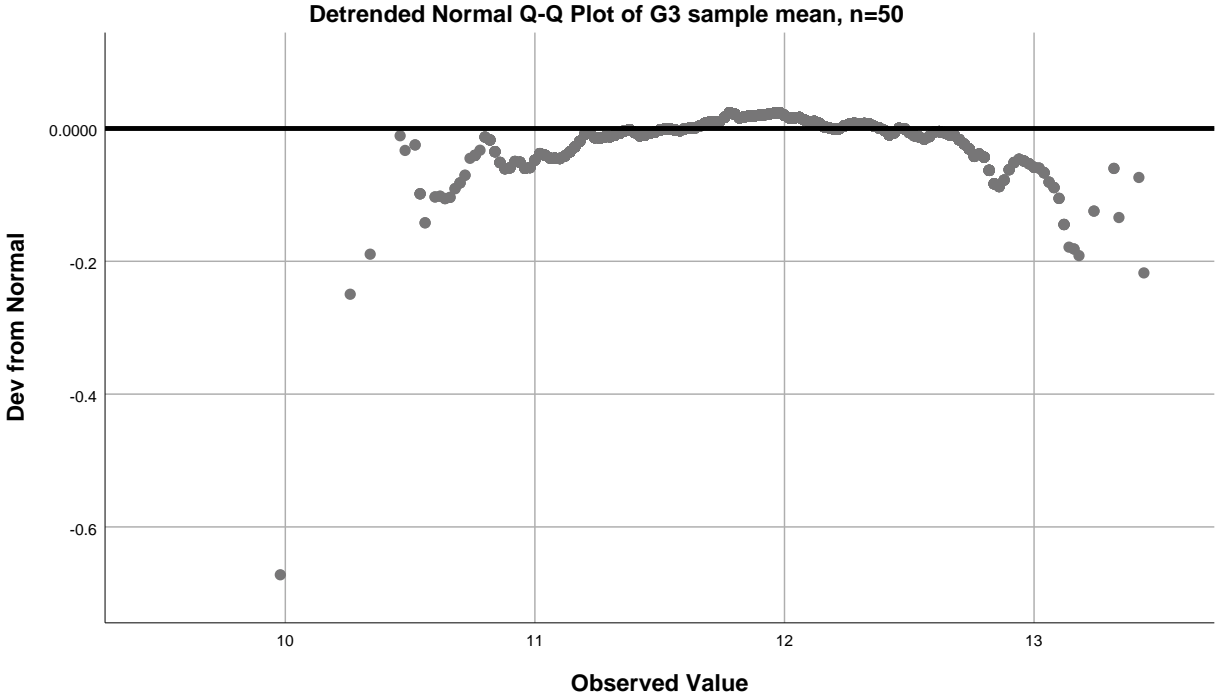


G3 sample mean, n=50

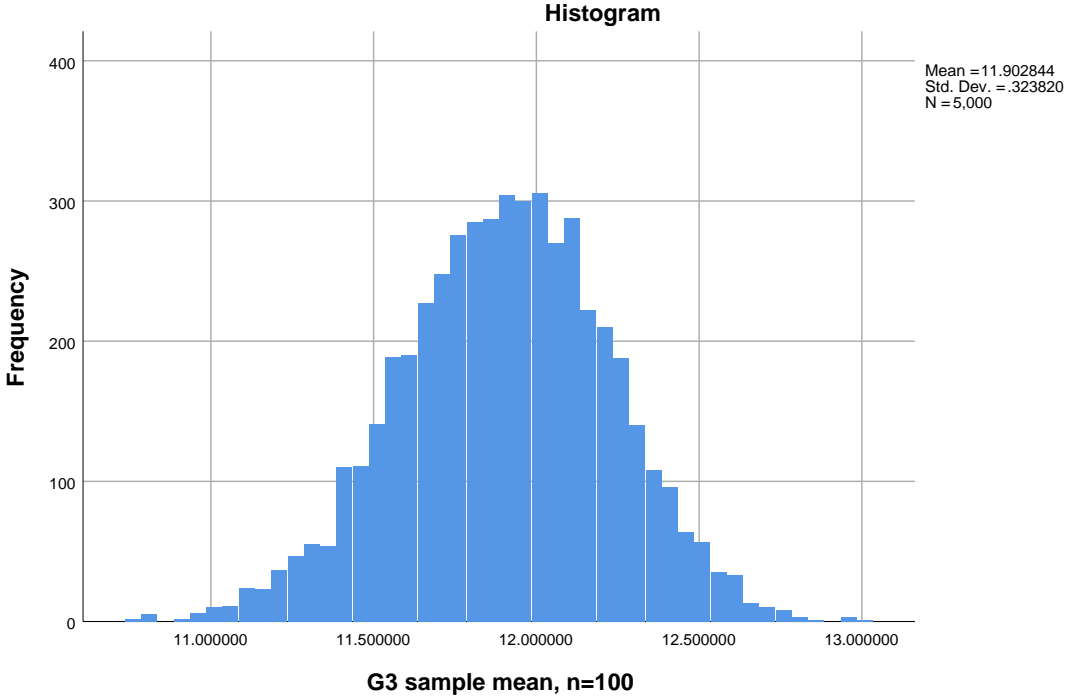
Central Limit Theorem: Sampling Distributions of the Mean



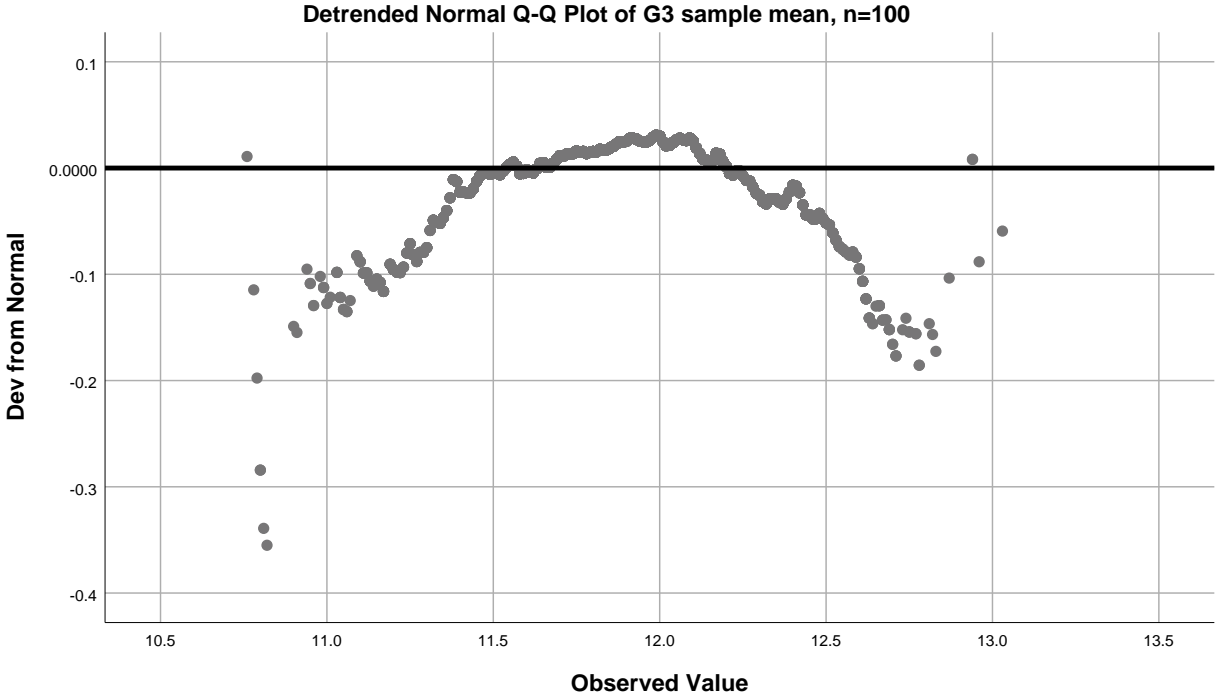
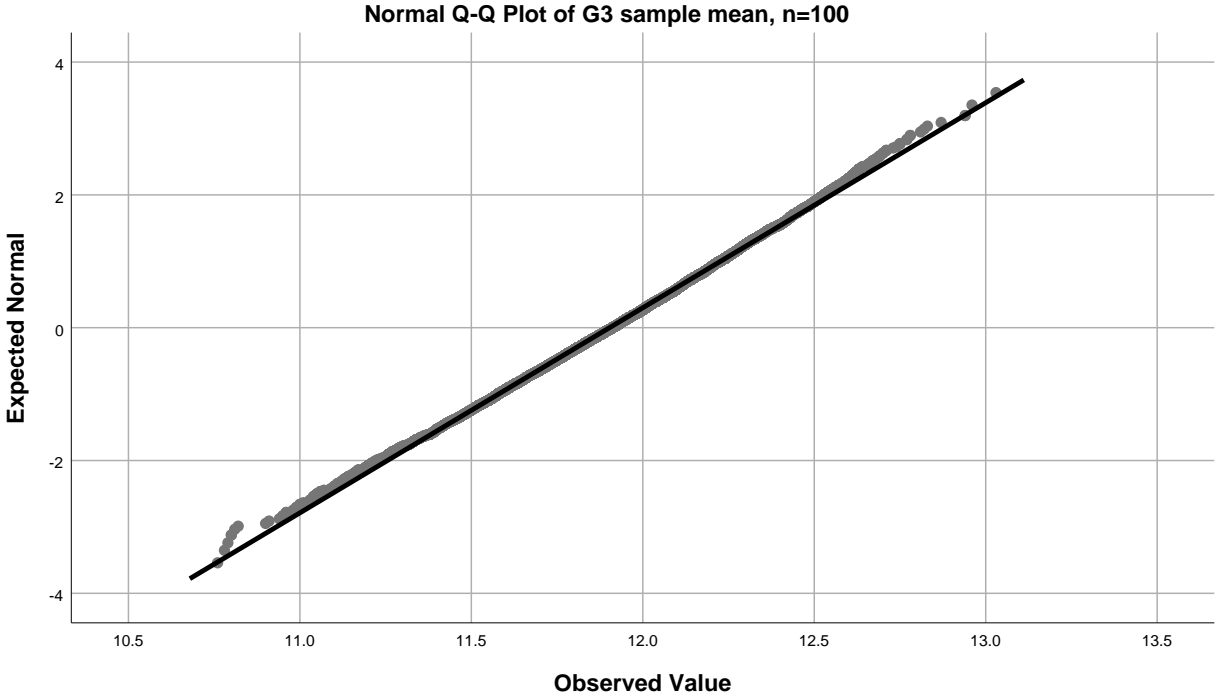
Central Limit Theorem: Sampling Distributions of the Mean



G3 sample mean, n=100



Central Limit Theorem: Sampling Distributions of the Mean



EXAMINE VARIABLES=

Central Limit Theorem: Sampling Distributions of the Mean

```
absences_mean_n5 absences_mean_n10 absences_mean_n30 absences_mean_n50 absences_mean_n100  
/PLOT HISTOGRAM NPLOT  
/COMPARE GROUPS  
/STATISTICS DESCRIPTIVES  
/CINTERVAL 95  
/MISSING LISTWISE  
/NOTOTAL.
```

Explore

Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
Absences sample mean, n=5	5000	100.0%	0	0.0%	5000	100.0%
Absences sample mean, n=10	5000	100.0%	0	0.0%	5000	100.0%
Absences sample mean, n=30	5000	100.0%	0	0.0%	5000	100.0%
Absences sample mean, n=50	5000	100.0%	0	0.0%	5000	100.0%
Absences sample mean, n=100	5000	100.0%	0	0.0%	5000	100.0%

Central Limit Theorem: Sampling Distributions of the Mean

Descriptives

		Statistic	Std. Error	
Absences sample mean, n=5	Mean	3.67144000	.029095755	
	95% Confidence Interval for Mean	Lower Bound	3.61439956	
		Upper Bound	3.72848044	
	5% Trimmed Mean	3.55177778		
	Median	3.40000000		
	Variance	4.233		
	Std. Deviation	2.057380589		
	Minimum	.000000		
	Maximum	14.800000		
	Range	14.800000		
	Interquartile Range	2.600000		
	Skewness	.928	.035	
	Kurtosis	1.261	.069	
Absences sample mean, n=10	Mean	3.64144000	.020744045	
	95% Confidence Interval for Mean	Lower Bound	3.60077257	
		Upper Bound	3.68210743	
	5% Trimmed Mean	3.58042222		
	Median	3.50000000		
	Variance	2.152		
	Std. Deviation	1.466825498		
	Minimum	.200000		
	Maximum	11.400000		
	Range	11.200000		
	Interquartile Range	1.900000		
	Skewness	.667	.035	
	Kurtosis	.651	.069	
Absences sample mean, n=30	Mean	3.65428667	.011973780	
	95% Confidence Interval for Mean	Lower Bound	3.63081281	
		Upper Bound	3.67776053	
	5% Trimmed Mean	3.63489630		
	Median	3.60000000		
	Variance	.717		
	Std. Deviation	.846674079		

Central Limit Theorem: Sampling Distributions of the Mean

Descriptives

		Statistic	Std. Error	
	Minimum	1.000000		
	Maximum	6.933333		
	Range	5.933333		
	Interquartile Range	1.133333		
	Skewness	.364	.035	
	Kurtosis	.154	.069	
Absences sample mean, n=50	Mean	3.66823200	.009293997	
	95% Confidence Interval for Mean	Lower Bound	3.65001169	
		Upper Bound	3.68645231	
	5% Trimmed Mean	3.65609333		
	Median	3.64000000		
	Variance	.432		
	Std. Deviation	.657184824		
	Minimum	1.420000		
	Maximum	6.180000		
	Range	4.760000		
	Interquartile Range	.860000		
	Skewness	.280	.035	
	Kurtosis	.086	.069	
	Absences sample mean, n=100	Mean	3.65805800	.006638506
95% Confidence Interval for Mean		Lower Bound	3.64504362	
		Upper Bound	3.67107238	
5% Trimmed Mean		3.65218444		
Median		3.64000000		
Variance		.220		
Std. Deviation		.469413249		
Minimum		2.120000		
Maximum		5.430000		
Range		3.310000		
Interquartile Range		.630000		
Skewness		.199	.035	
Kurtosis		.002	.069	

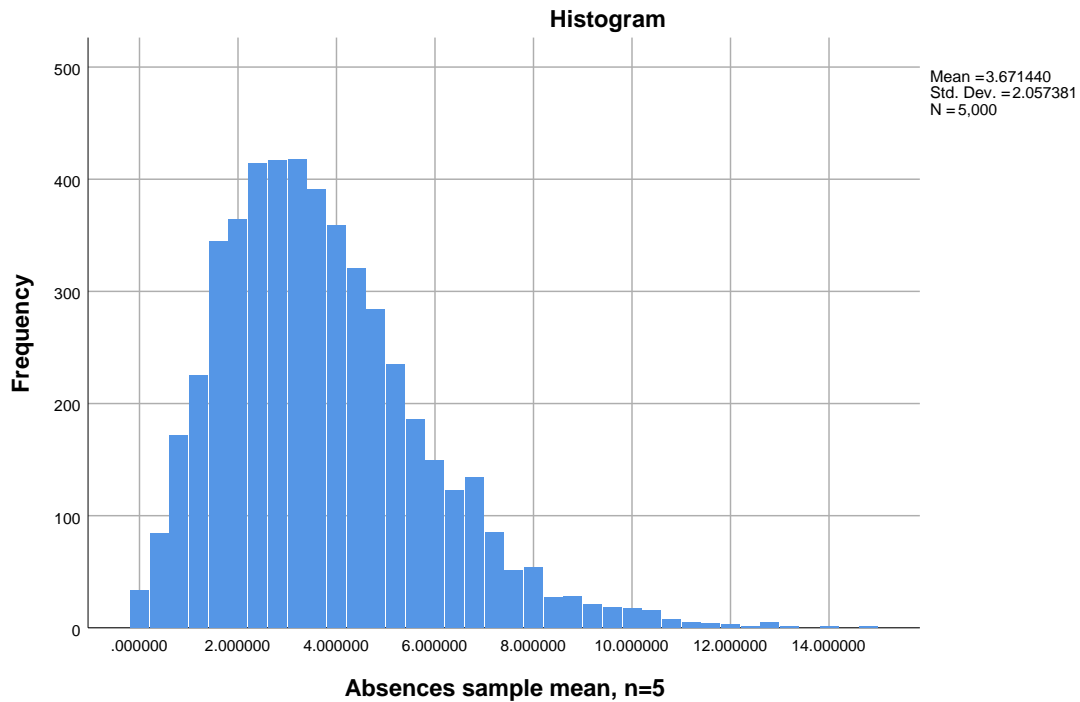
Central Limit Theorem: Sampling Distributions of the Mean

Tests of Normality

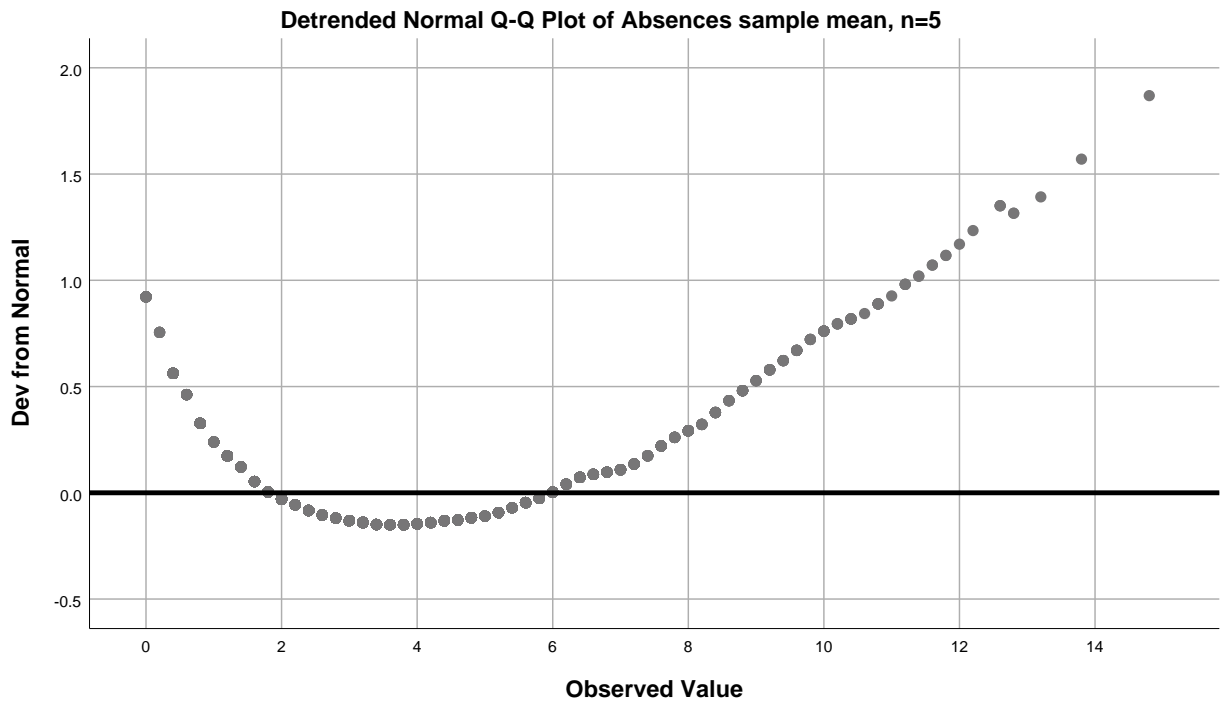
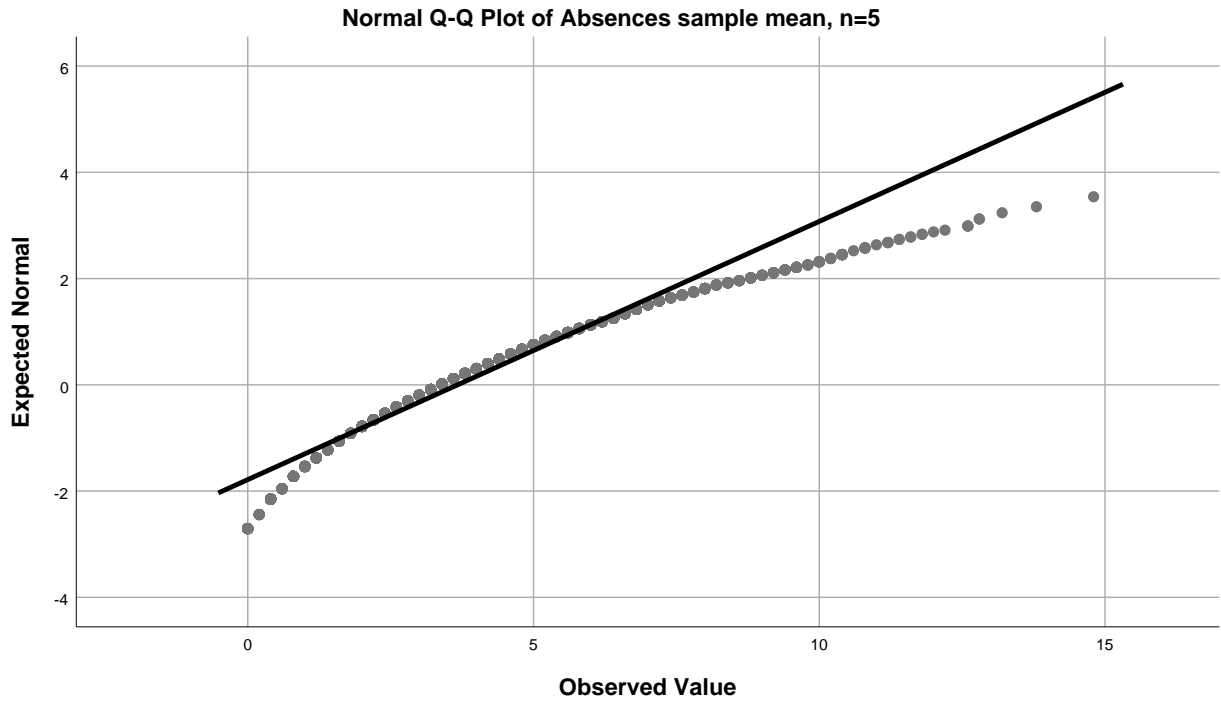
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Absences sample mean, n=5	.086	5000	.000	.952	5000	.000
Absences sample mean, n=10	.062	5000	.000	.975	5000	.000
Absences sample mean, n=30	.038	5000	.000	.992	5000	.000
Absences sample mean, n=50	.030	5000	.000	.995	5000	.000
Absences sample mean, n=100	.025	5000	.000	.997	5000	.000

a. Lilliefors Significance Correction

Absences sample mean, n=5

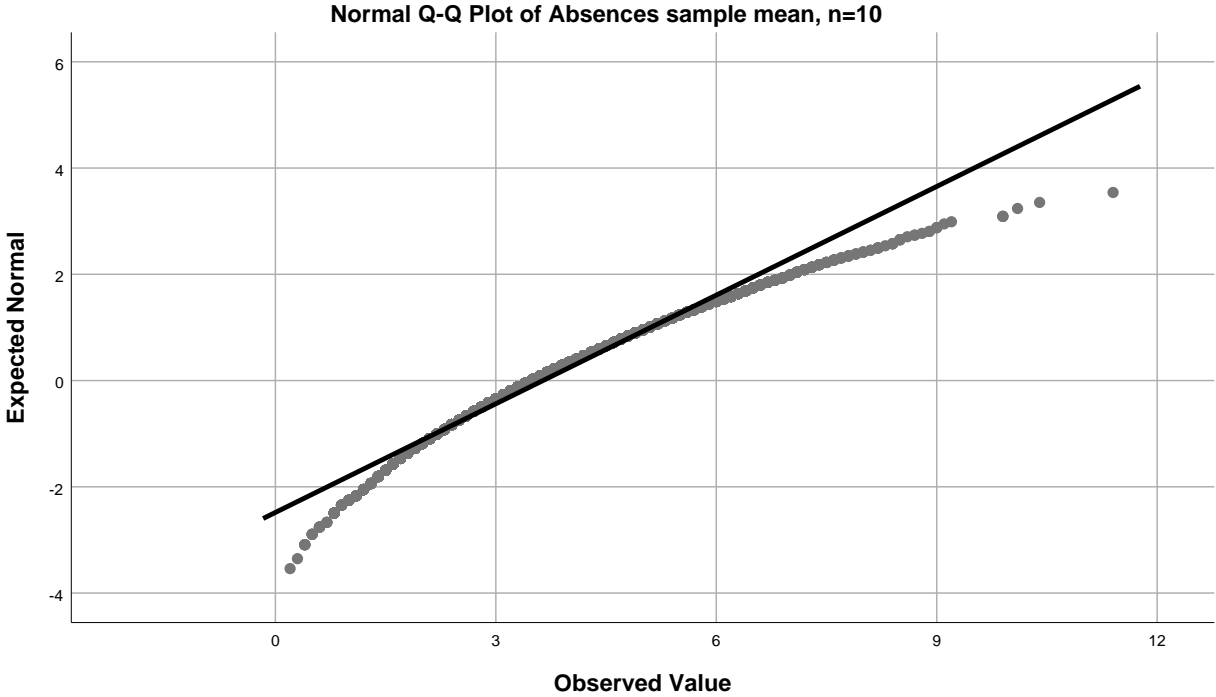
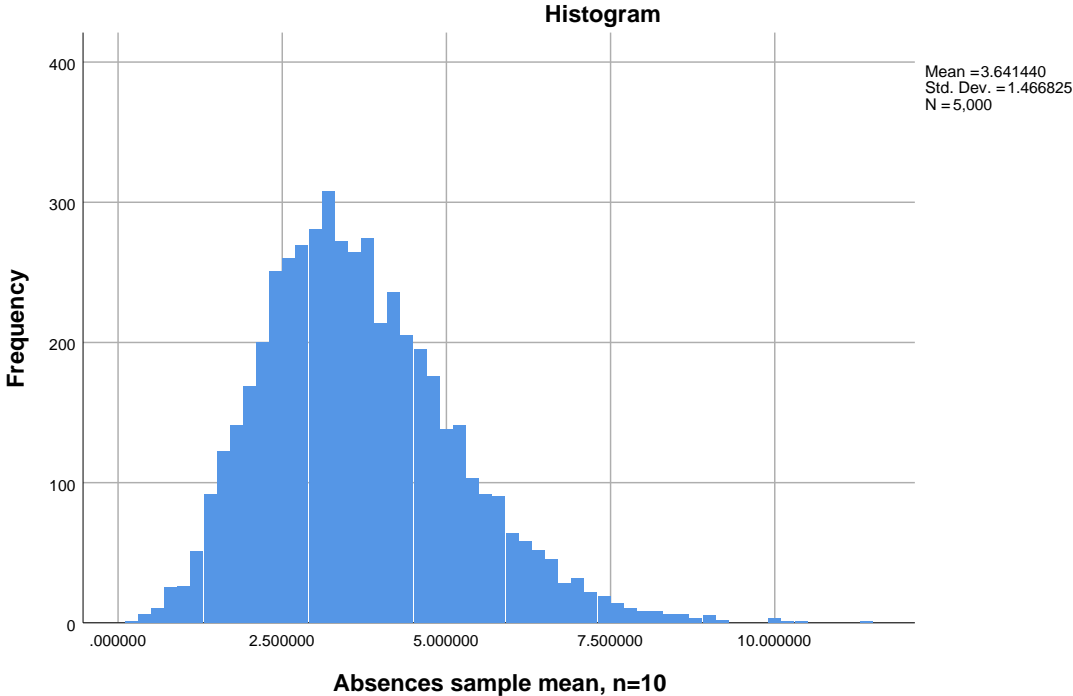


Central Limit Theorem: Sampling Distributions of the Mean

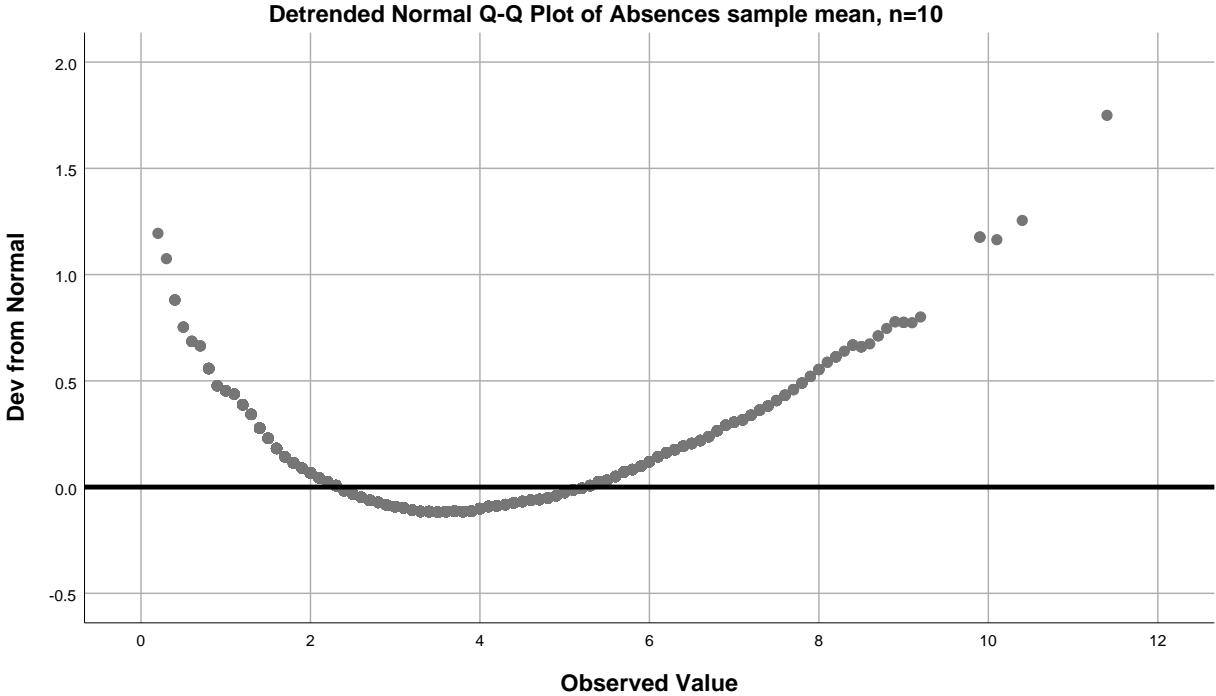


Absences sample mean, n=10

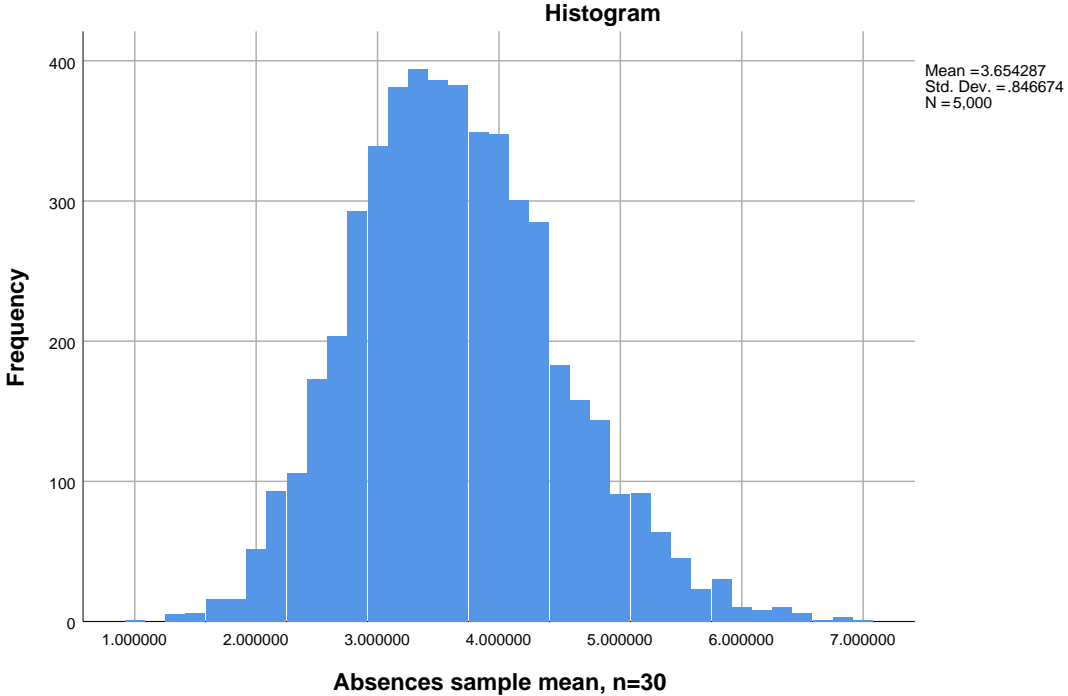
Central Limit Theorem: Sampling Distributions of the Mean



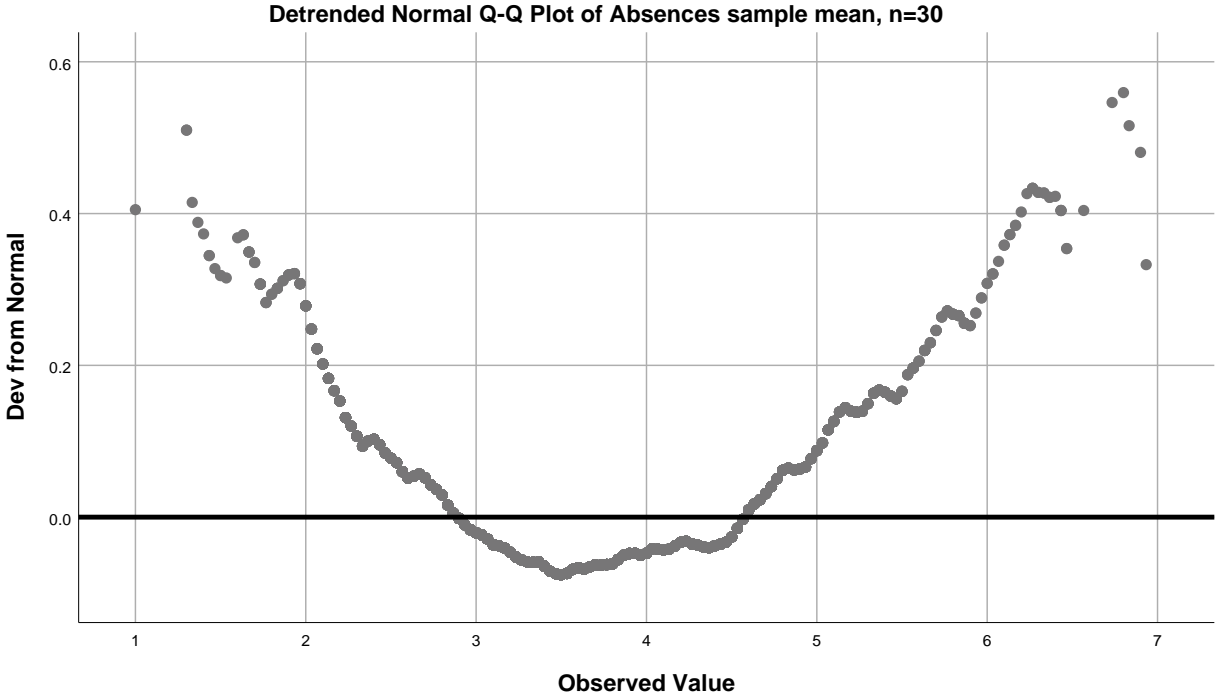
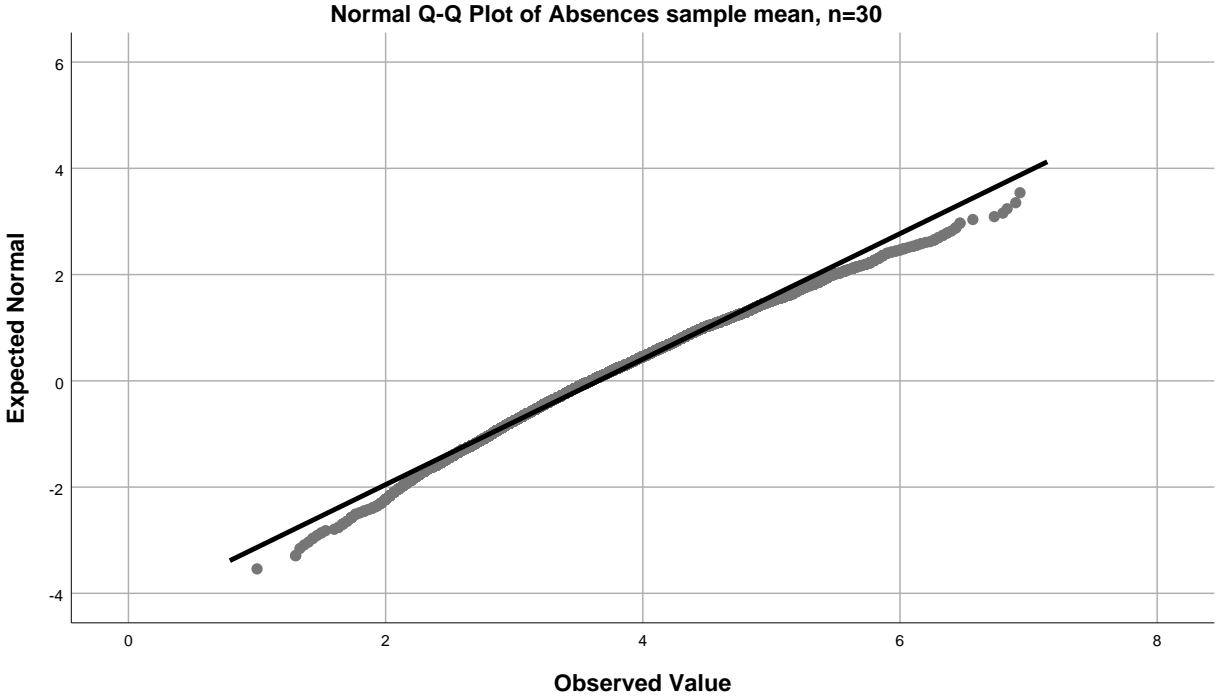
Central Limit Theorem: Sampling Distributions of the Mean



Absences sample mean, n=30

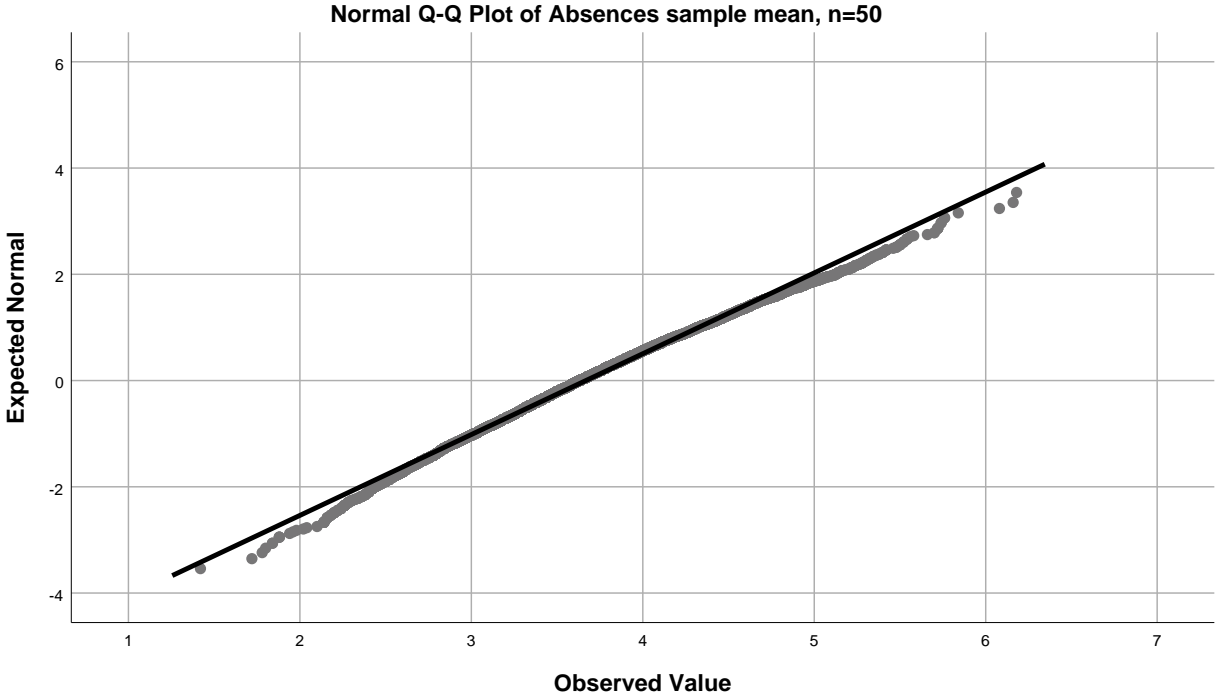
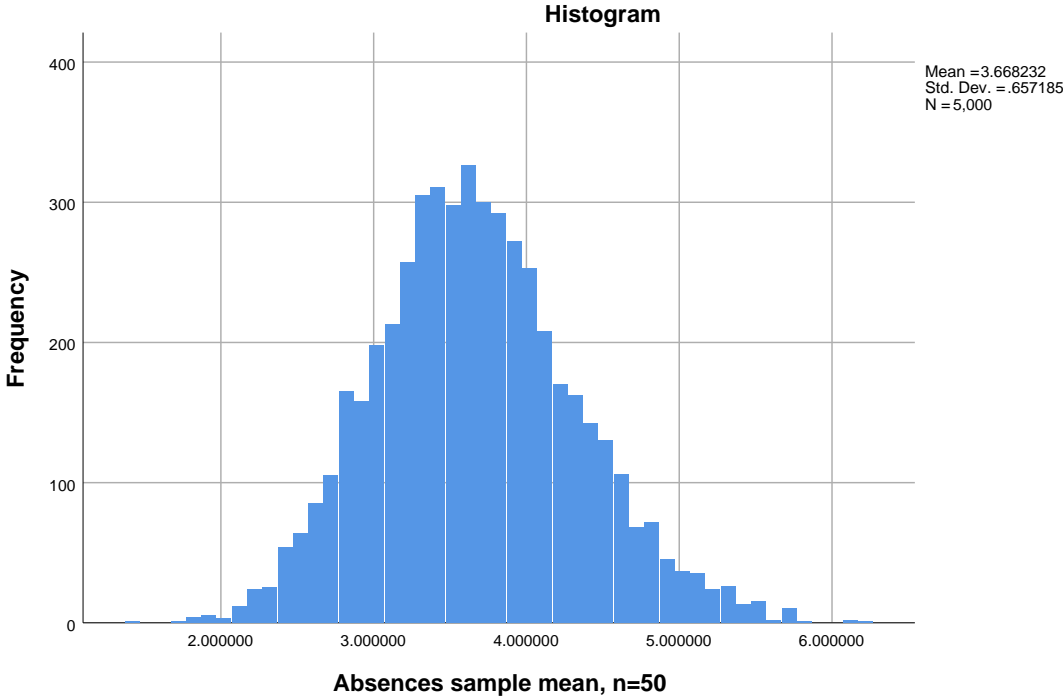


Central Limit Theorem: Sampling Distributions of the Mean

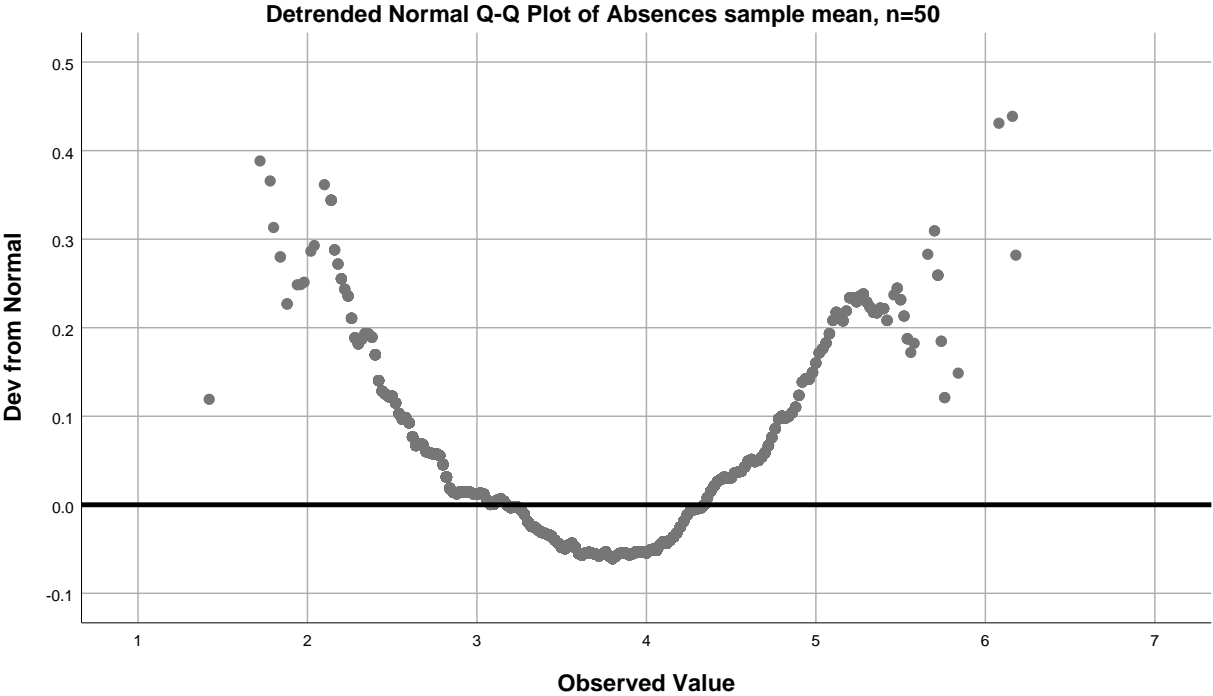


Absences sample mean, n=50

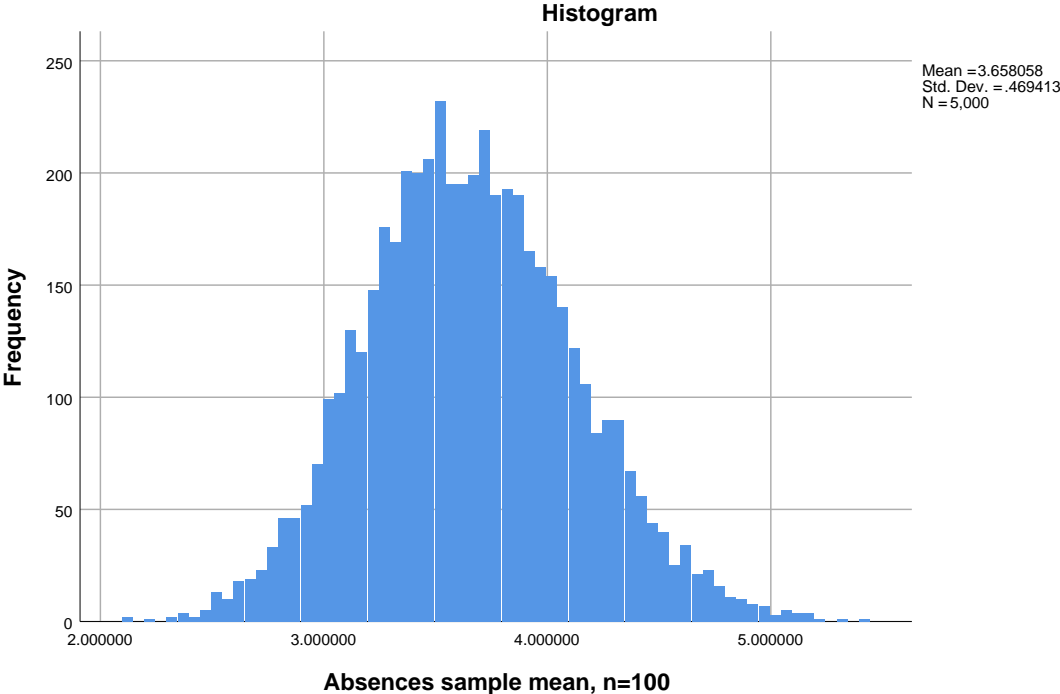
Central Limit Theorem: Sampling Distributions of the Mean



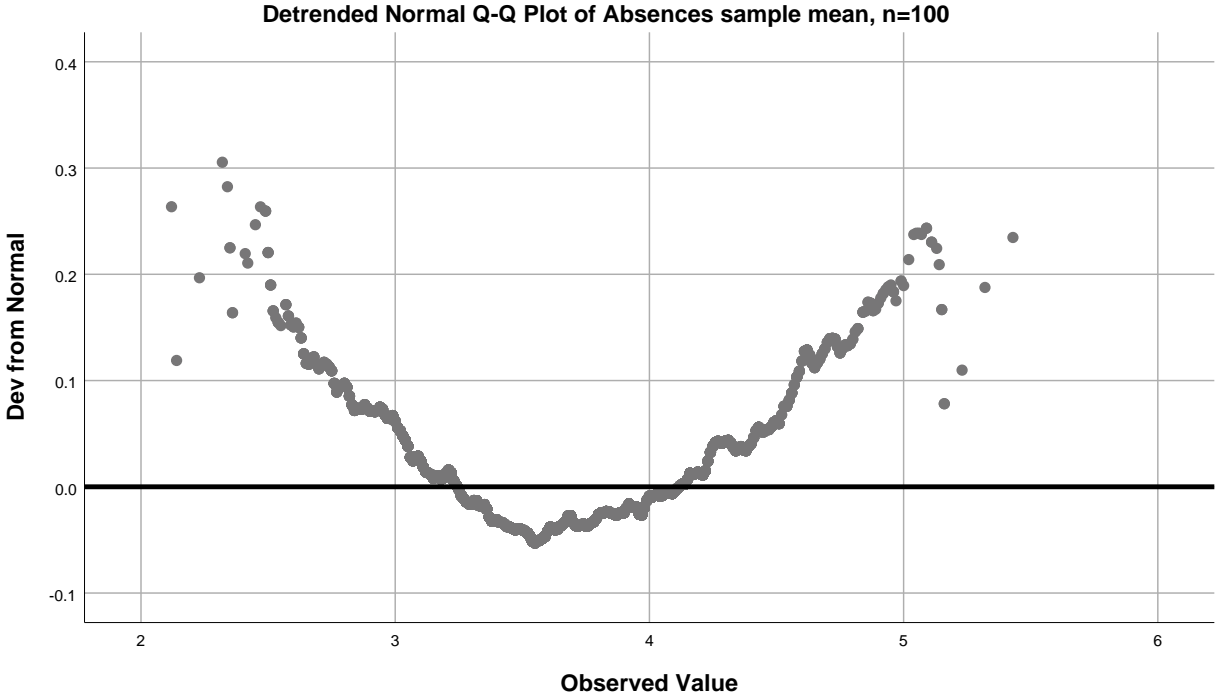
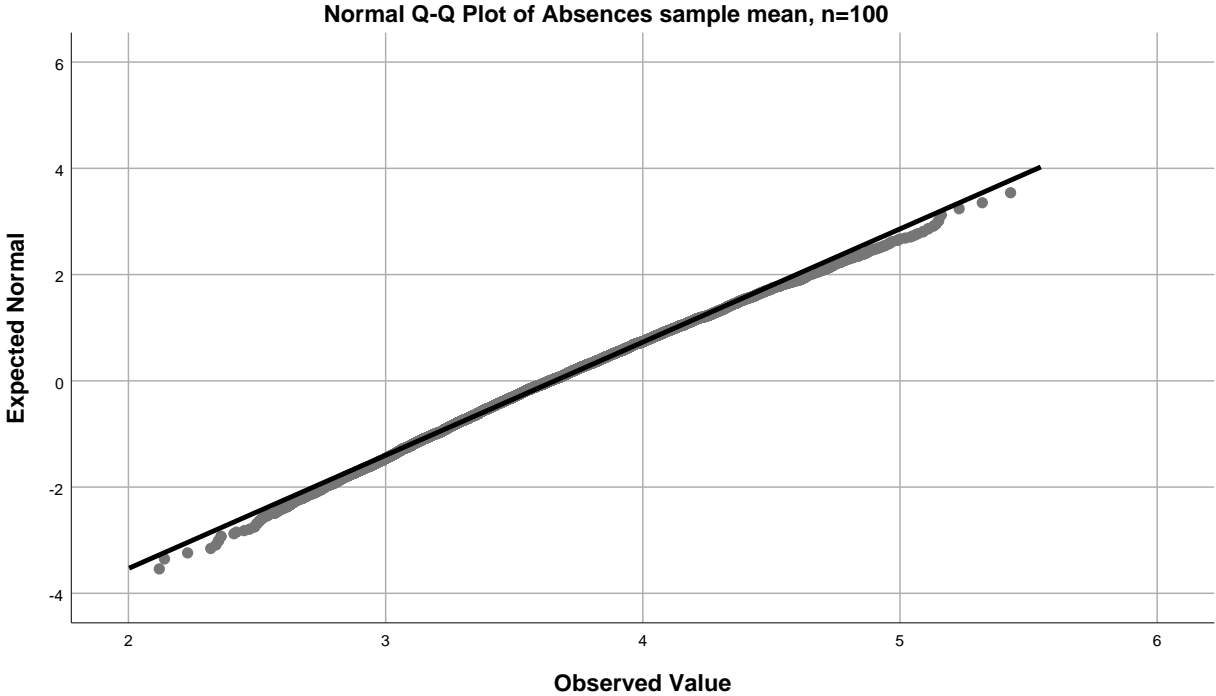
Central Limit Theorem: Sampling Distributions of the Mean



Absences sample mean, n=100



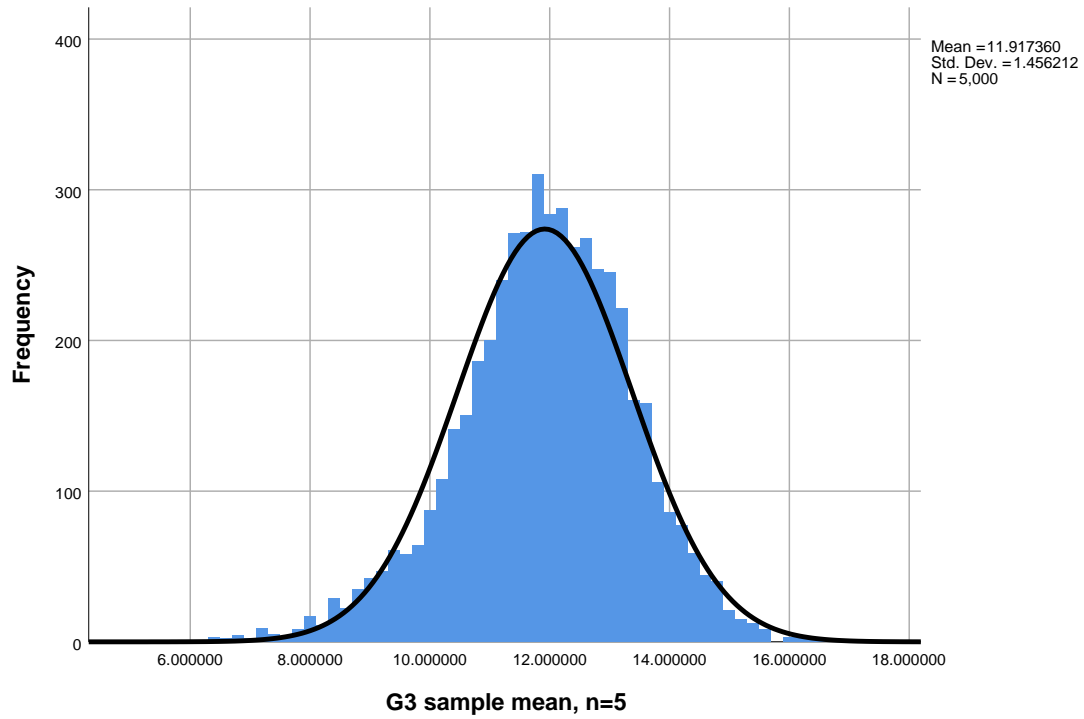
Central Limit Theorem: Sampling Distributions of the Mean



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GRAPH /HISTOGRAM(NORMAL)=g3_mean_n5.
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Central Limit Theorem: Sampling Distributions of the Mean

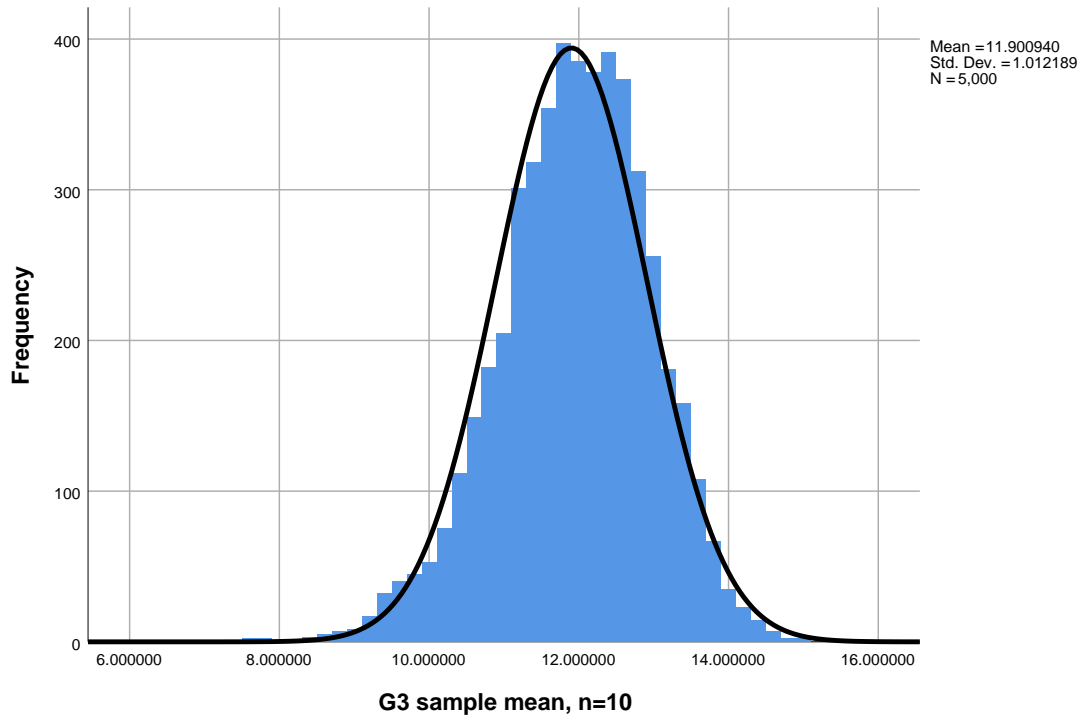
Graph



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Graph

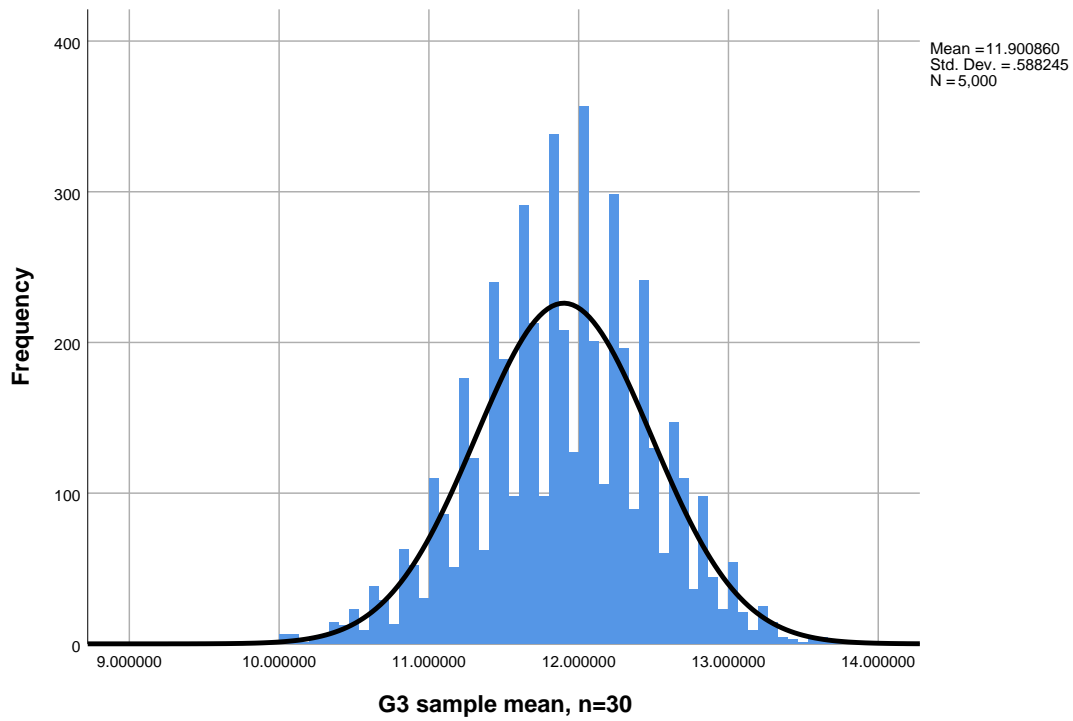
Central Limit Theorem: Sampling Distributions of the Mean



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Graph

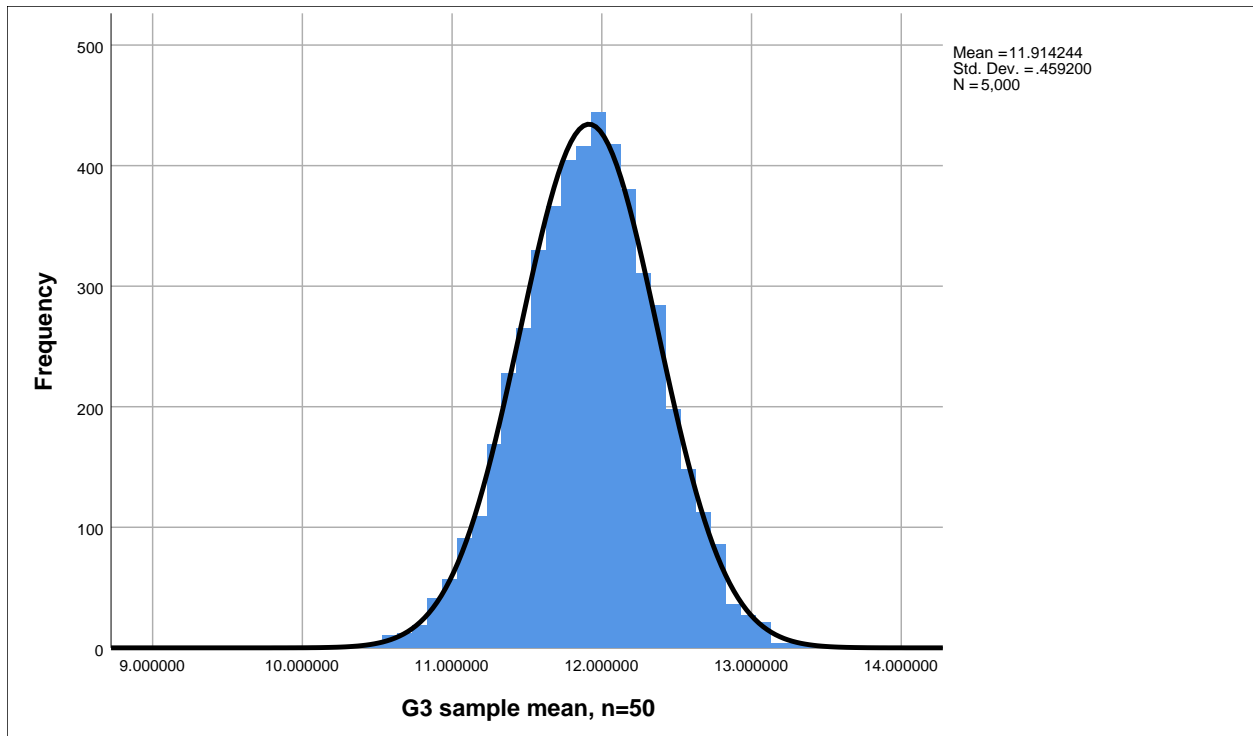
Central Limit Theorem: Sampling Distributions of the Mean



GRAPH /HISTOGRAM(NORMAL,)=g3_mean_n50.

Graph

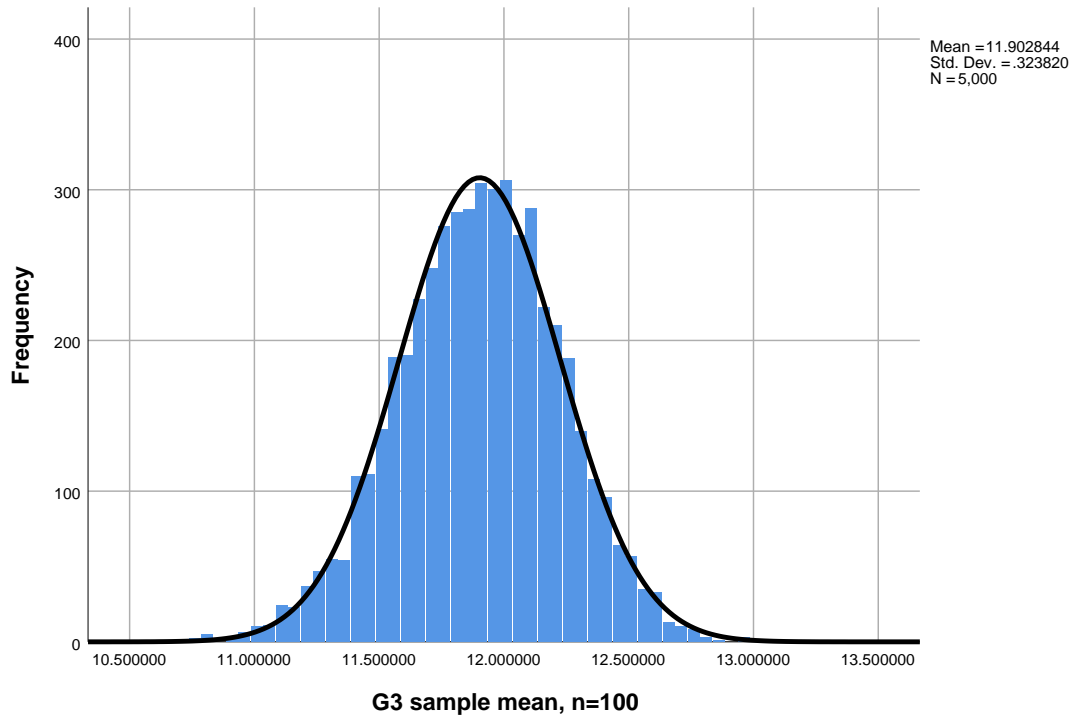
Central Limit Theorem: Sampling Distributions of the Mean



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Graph

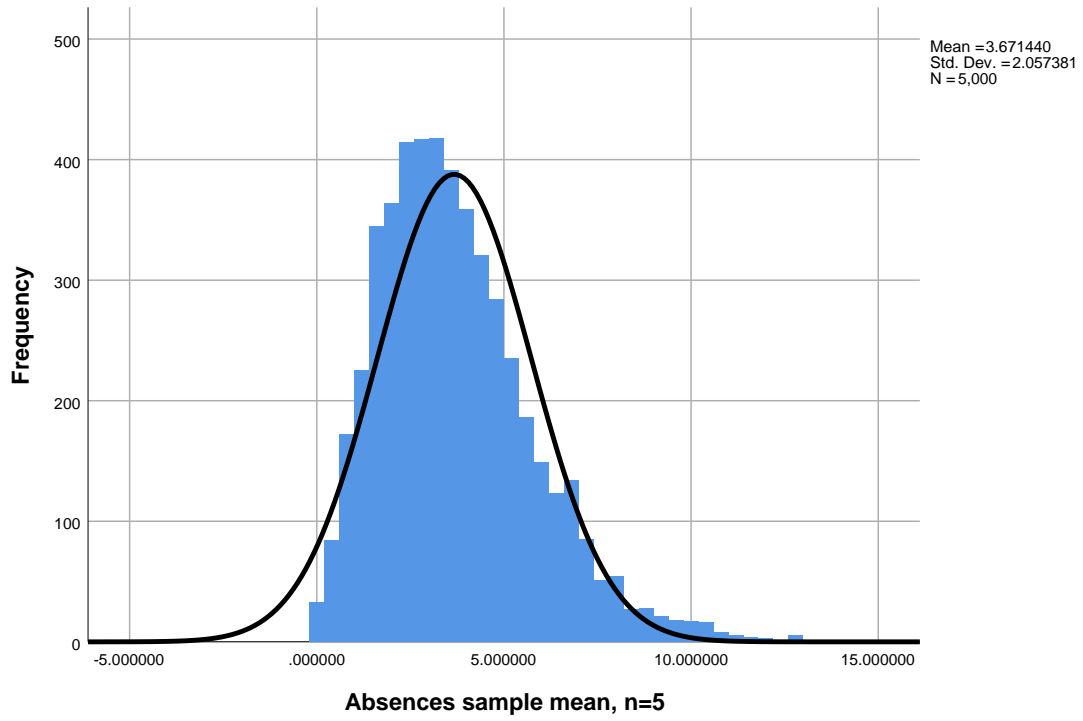
Central Limit Theorem: Sampling Distributions of the Mean



GRAPH /HISTOGRAM(NORMAL)=absences_mean_n5.

Graph

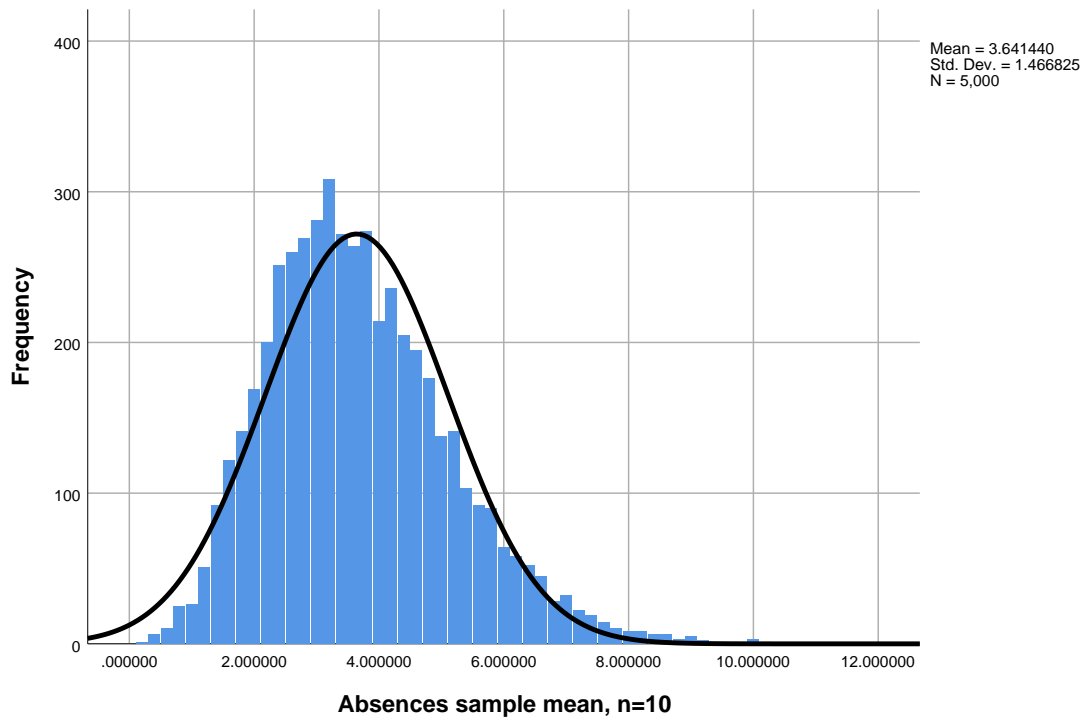
Central Limit Theorem: Sampling Distributions of the Mean



GRAPH /HISTOGRAM(NORMAL)=absences_mean_n10.

Graph

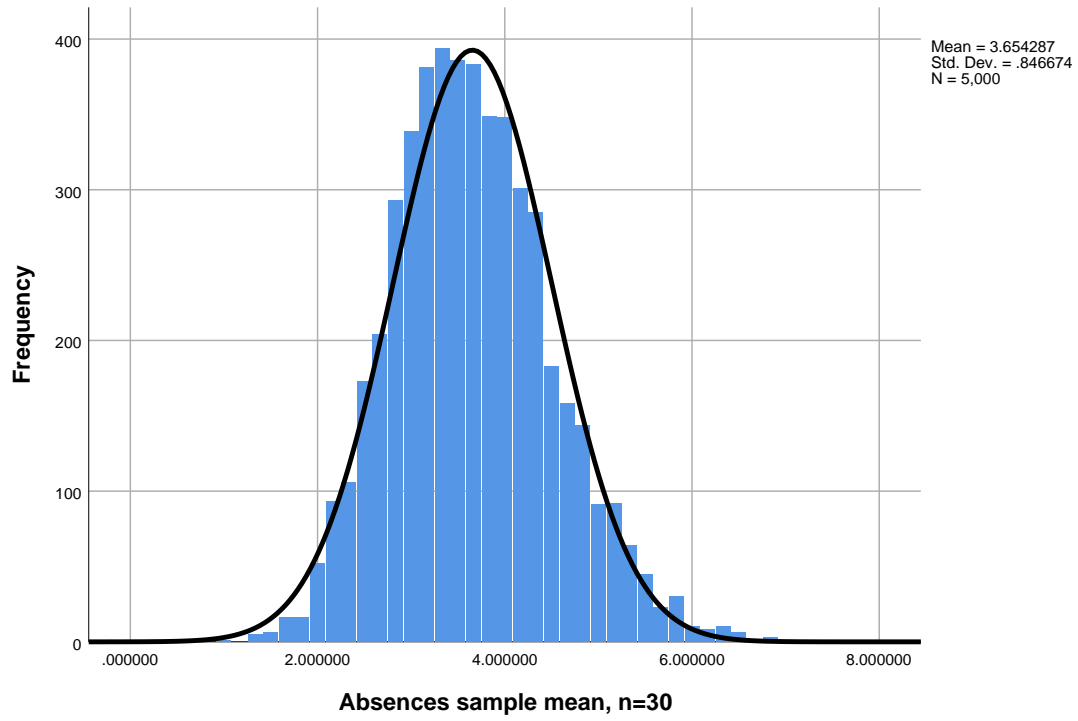
Central Limit Theorem: Sampling Distributions of the Mean



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Graph

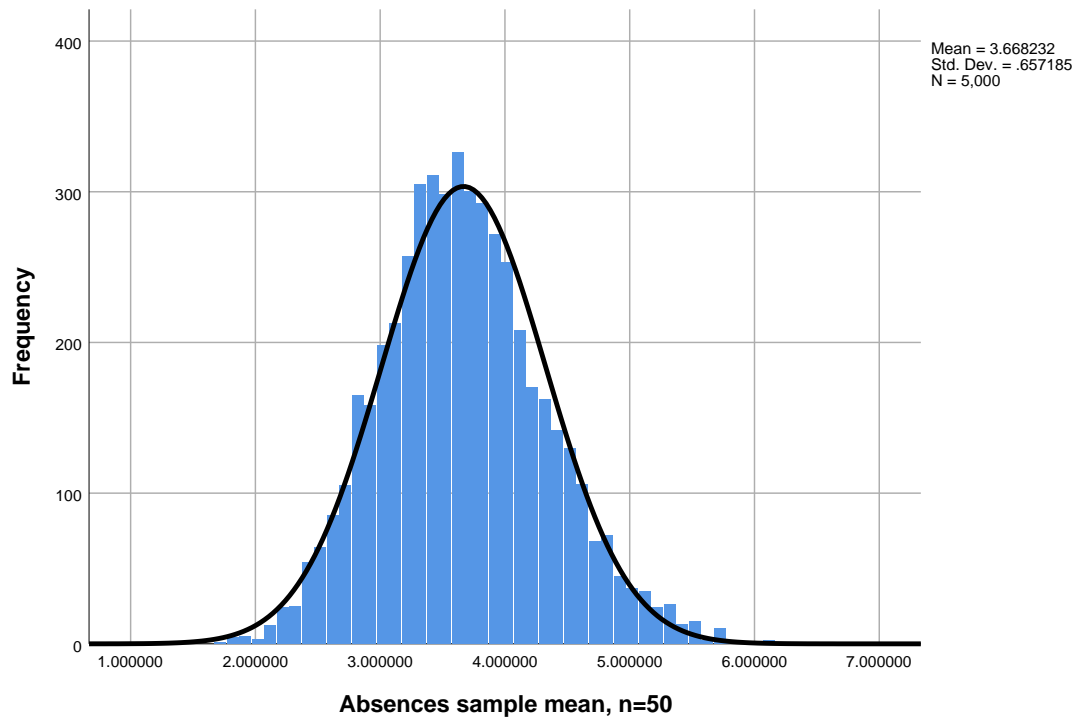
Central Limit Theorem: Sampling Distributions of the Mean



GRAPH /HISTOGRAM(NORMAL)=absences_mean_n50.

Graph

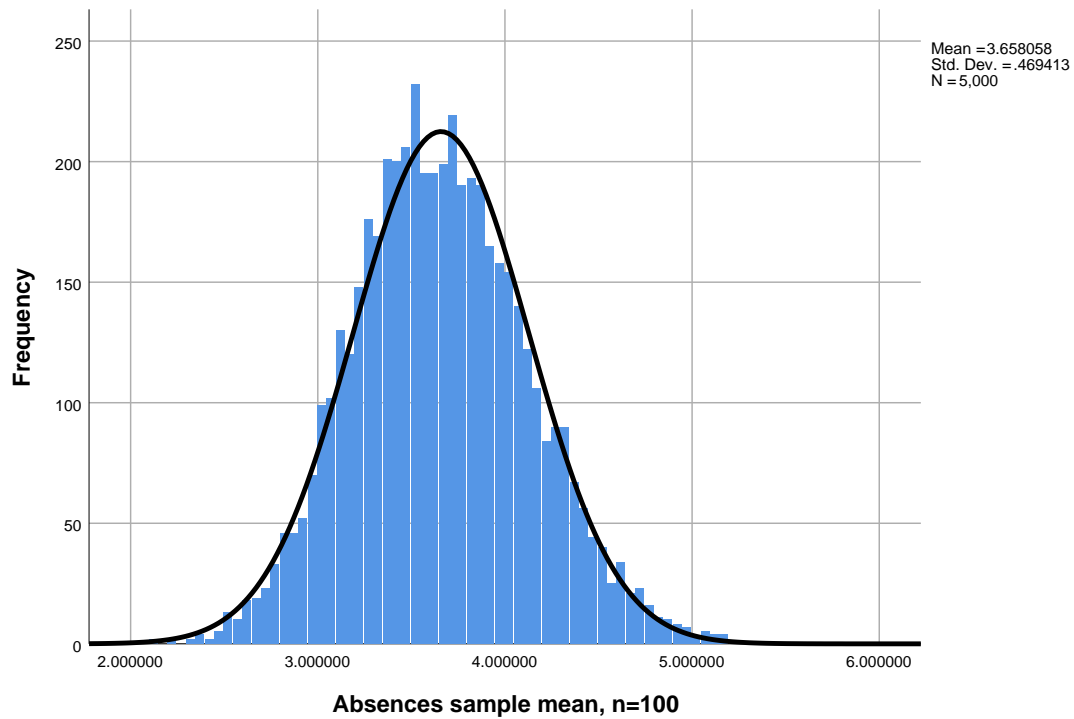
Central Limit Theorem: Sampling Distributions of the Mean



GRAPH /HISTOGRAM(NORMAL)=absences_mean_n100.

Graph

Central Limit Theorem: Sampling Distributions of the Mean



```
SAVE OUTFILE="D:\DATA ANALYSIS\A Basic Descriptive Statistics Guides\Central L  
imit Theorem\SPSS\central_limit_theorem_sampling_means.sav"  
/COMPRESSED.
```

```
OUTPUT EXPORT  
/CONTENTS EXPORT=VISIBLE
```