



Example Comparison Guide Between RAT-STATS 2017 and RAT-STATS 2010

April 20, 2017

Single Stage Random Numbers

Example 1 (test00)

The screenshot displays the 'Single Stage Random Numbers' application window. The 'Input Options' section includes the 'Audit/Review Name' set to 'Test00', a 'Custom Seed Number' of 4967669.23100000, and a 'Sequential' count of 400. The 'Output Options' section shows 'Access / Excel File' unchecked and 'Text File' checked. The 'Output Preview' table shows the following data:

	A	B	C	D	E
1	Audit Name:	Test00	Number Type	Selection Order	Value
2	Seed Used:	4,967,669.23	(Spare)	264	-4,972
3	Frame Size:	55,001	(Spare)	293	-4,704
4	Creation Date:	April 20, 2017	(Spare)	225	-4,630
5	Creation Time:	01:46:55 AM	(Spare)	161	-4,519
6	Sequential Count:	400	(Spare)	187	-4,506
7	Random Order Count:	500			
8	Lower-Bound:	-5,000			
9	Upper-Bound:	50,000			
10	Total Sum:	20,057,374			
11	Total Count:	900			
12					
13					
14					
15					

A Notepad window titled 'SSRN_Test00.txt - Notepad' is open, displaying the following text:

```
Windows RAT-STATS  
Statistical Software  
Random Number Generator  
AUDIT: Test00  
Date: 4/20/2017  
SEED NUMBER: 4967669.23  
FRAME SIZE: 55,001  
FILE OF RANDOM NUMBERS: C:\documents and settings\CyberIllusion\My Document  
TOTAL RANDOM NUMBERS GENERATED: 900  
THE NUMBERS ARE IN THE FOLLOWING FORMAT IN YOUR FILE:  
POSITIONS 1 THROUGH 6 - ORDER OF SELECTION  
POSITIONS 7 THROUGH 17 - RANDOM NUMBER  
EACH COLUMN OF NUMBERS IS RIGHT JUSTIFIED.  
Selection  
Order Value  
264 -4972  
293 -4704  
225 -4630  
161 -4519  
187 -4506  
104 -4494  
361 -4331  
29 -4187  
157 -4146  
138 -4117  
267 -3875
```


Single Stage Random Numbers

Example 2 (test01)

The screenshot displays the 'Single Stage Random Numbers' application window. The 'Input Options' section includes an 'Audit/Review Name' field set to 'Test01', a 'Custom Seed Number' checkbox (unchecked), and several dropdown menus for 'Sequential' (100), 'Spares' (1), 'Low' (0), and 'High' (101). The 'Output Options' section has an 'Access / Excel File' checkbox (unchecked) and a 'Text File' checkbox (checked).

The 'Output Preview' section shows a table with the following data:

	A	B	C	D	E
1	Audit Name:	Test01	Number Type	Selection Order	Value
2	Seed Used:	10,661,935.55	(Spare)	60	0
3	Frame Size:	102	(Spare)	47	1
4	Creation Date:	April 20, 2017	(Spare)	78	2
5	Creation Time:	01:49:37 AM	(Spare)	10	3
6	Sequential Count:	100	(Spare)	25	4
7	Random Order Count:	1	(Spare)	67	5
8	Lower-Bound:	0	(Spare)	39	6
9	Upper-Bound:	101			
10	Total Sum:	5,122			
11	Total Count:	101			
12					
13					
14					
15					

Below the table is a 'Help' button.

An overlaid Notepad window titled 'SSRN_Test01.txt - Notepad' displays the following text:

```
File Edit Format View Help

Windows RAT-STATS
Statistical Software
Random Number Generator
AUDIT: Test01
Date: 4/20/2017
Time: 1:51

SEED NUMBER: 10661935.55
FRAME SIZE: 102

FILE OF RANDOM NUMBERS: C:\Documents and Settings\CyberIllusion\My Documents
TOTAL RANDOM NUMBERS GENERATED: 101

THE NUMBERS ARE IN THE FOLLOWING FORMAT IN YOUR FILE:
POSITIONS 1 THROUGH 6 - ORDER OF SELECTION
POSITIONS 7 THROUGH 17 - RANDOM NUMBER
EACH COLUMN OF NUMBERS IS RIGHT JUSTIFIED.

Selection
order    value
60       0
47       1
78       2
10       3
25       4
67       5
39       6
```

Single Stage Random Numbers

Example 3 (test02)

RAT-STATS 2010 appears to have crashed in this case. The User Guide says that the limit is 10,000 so I am unsure why/how the old version of RAT-STATS failed. The classic runtime error indicates that an array somewhere was being accessed out of bounds.

The screenshot displays the RAT-STATS 2010 application interface. A runtime error dialog box is visible, stating "Run-time error '9': Subscript out of range". The main window shows the "Single Stage Random Numbers" configuration screen. The "Input Options" section includes fields for "Audit/Review Name" (Test02), "Custom Seed Number" (11394436.87786300), "Sequential" (9000), "Spares" (500), "Low" (1), and "High" (9999999). The "Output Options" section shows "Access / Excel File" (unchecked) and "Text File" (checked). The "Output Preview" section displays a table with 13 rows and 5 columns (A, B, C, D, E).

	A	B	C	D	E
1	Audit Name:	Test02	Number Type	Selection Order	Value
2	Seed Used:	11,394,436.88	(Spare)	2,767	248
3	Frame Size:	9,999,999	(Spare)	491	1,173
4	Creation Date:	April 20, 2017	(Spare)	3,117	2,654
5	Creation Time:	02:56:16 AM	(Spare)	7,282	2,868
6	Sequential Count:	9,000	(Spare)	8,399	5,439
7	Random Order Count:	500	(Spare)	5,882	5,611
8	Lower-Bound:	1	(Spare)	8,160	6,404
9	Upper-Bound:	9,999,999	(Spare)	7,044	7,454
10	Total Sum:	47,235,404,745	(Spare)	7,151	7,862
11	Total Count:	9,500	(Spare)	4,136	7,968
12			(Spare)	7,387	8,305
13			(Spare)	683	9,454

Unrestricted Attribute Appraisal Example 1 (test00)

Windows RAT-STATS
Statistical Software
Single Stage Attribute Appraisal

Date: 4/20/2017 Time: 2:38 am
Audit: Test00

Universe Size: 5
Sample Size: 2
Characteristic of Interest: 2
Quantity Identified in Sample: 2
Projected Quantity in Universe: 5
Percent: 100.000%

Confidence Limits

	80% Confidence Level	90% Confidence Level	95% Confidence Level
Lower Limit - Quantity	3	2	2
Percent	60.000%	40.000%	40.000%

Since all sample items had the characteristic(s) of interest, the program has calculated only the minimum number of items having the characteristic(s) of interest in the universe for each confidence level.

HELP EXIT Previous Screen Main Menu

Sample Size: 2 Number with COI: 2 Output Options: ☒ Text File ☐ Excel / Access

Audit Test00

Audit/Review: Test00

Application: RAT-STATS Statistical Software
Module: Unrestricted Attribute Appraisal
Author: CyberIllusion
Date: April 20, 2017
Time: 02:38:23 AM

	80%	90%	95%
Population size:	5	5	5
Sample size:	2	2	2
Characteristic of interest:	2	2	2
Projected Total:	5	5	5
Projected Percent:	100.000%	100.000%	100.000%
Standard Error(Total):	0	0	0
Standard Error(Percent):	0.000%	0.000%	0.000%

Lower Total 3 2 2
Lower Percent 60.000% 40.000% 40.000%

Unrestricted Attribute Appraisal Example 2 (test01)

Paint

Image Colors Help

RAT-STATS 2017

Unrestricted Attribute Appraisal

File Help

Audit/Review Name:

Test01

Universe Size:

150

Sample Size:

100

Date

04-20-2017

Audit/Review: Test01

Applicaton: RAT-STATS Statistical Software

Module: Unrestricted Attribute Appraisal

Author: CyberIllusion

Date: April 20, 2017

Time: 02:41:51 AM

Population size: 150

Sample size: 100

Characteristic of interest: 97

Projected Total: 146

Projected Percent: 97.000%

Standard Error(Total): 1

Standard Error(Percent): 0.990%

Unrestricted Attribute Appraisal Output

Date

4/20/2017

Time

2:40 am

Windows RAT-STATS

Statistical Software

Single Stage Attribute Appraisal

Audit: Test01

Universe Size

150

Sample Size

100

Characteristic of Interest

Quantity Identified in Sample

97

Projected Quantity in Universe

145

Percent

97.000%

Confidence Limits

80% Confidence Level

90% Confidence Level

95% Confidence Level

Lower Limit - Quantity

143

142

141

Percent

95.333%

94.667%

94.000%

Since all sample items had the characteristic(s) of interest, the program has calculated only the minimum number of items having the characteristic(s) of interest in the universe for each confidence level.

HELP

EXIT

Previous Screen

Main Menu

	80%	90%	95%
Lower Total:	143	142	141
Lower Percent:	95.333%	94.667%	94.000%
Upper Total:	147	147	147
Upper Percent:	98.000%	98.000%	98.000%

Unrestricted Attribute Appraisal Example 3 (test02)

Windows RAT-STATS
Statistical Software
Single Stage Attribute Appraisal

Date: 4/20/2017 Time: 2:49 am

Audit: Test02

Universe Size: 2,131,341,220
Sample Size: 20,000
Characteristic of Interest: 20
Quantity Identified in Sample: 20
Projected Quantity in Universe: 2,131,341
Percent: .100%

Confidence Limits

	80% Confidence Level	90% Confidence Level	95% Confidence Level
Lower Limit - Quantity	1,548,090	1,412,716	1,302,103
Percent	.073%	.066%	.061%

Since all sample items had the characteristic(s) of interest, the program has calculated only the minimum number of items having the characteristic(s) of interest in the universe for each confidence level.

Audit/Review: Test02
Applicaton: RAT-STATS Statistical Software
Module: Unrestricted Attribute Appraisal
Author: CyberIllusion
Date: April 20, 2017
Time: 02:48:39 AM
Population size: 2,131,341,220
Sample size: 20,000
Characteristic of interest: 20
Projected Total: 2,131,341
Projected Percent: 0.100%
Standard Error(Total): 476,354
Standard Error(Percent): 0.022%

	80%	90%	95%
Lower Total:	1,548,090	1,412,716	1,302,103
Lower Percent:	0.073%	0.066%	0.061%
Upper Total:	2,881,605	3,096,347	3,290,782
Upper Percent:	0.135%	0.145%	0.154%

Text File: C:/dev/bin/TeamCBTek/release/UAA_Test01_2017.txt

Unrestricted Variable Appraisal

Example 1 (test00)

The screenshot displays the RAT-STATS 2017 software interface. The main window shows the audit results for 'Test00'. The interface includes a menu bar (File, Edit, Build, Debug, Analyze, Tools, Window, Help) and a toolbar with various icons. The main display area is divided into several sections:

- Audit / Review Name:** Test00
- Universe Size:** 1000
- Data Format Options:** Examined, Audited, Difference (selected), Examined / Audited, Audited / Difference, Examined / Difference.
- Microsoft Excel (Product Activation Failed)** window is open in the foreground, showing the 'Review' tab and the 'RAT-STATS 2017' menu.
- Audit Results Table:**

Audit Results		Confidence Levels		
		80%	90%	95%
Population Size	1,000			
Sample Size	999			
Difference Values				
Count of Nonzero Items	539			
Mean	14,234.90			
Standard Deviation	31,492.46			
Skewness	3.17			
Standard Error (Mean)	31.51			
Standard Error (Total)	31,508			
Point Estimate	14,234,898			

Unrestricted Variable Appraisal

Example 2 (test01)

This comparison utilized the “HTML” output option in RAT-STATS 2017 to better compare more amounts of data

The image displays two side-by-side screenshots. The left screenshot shows the HTML output of RAT-STATS 2017, and the right screenshot shows the VBA code in Microsoft Excel.

Left Screenshot (HTML Output):

Sample Type: Summary for Examine Values
Audit Name: Test01 Run 3b
Universe Size: 782,543
Sample Size: 3
Nonzero Count: 3
Creation Date: April 20, 2017
Creation Time: 01:16:00 PM
Created By: cbtek

Mean: 2,941.48
Skewness: 0.70
Total Sum: 8,824.43
Std. Deviation: 3,685.66
Std. Err. Mean: 2,127.91
Std. Err. Total: 1,665,184,761
Point Estimate: 2,301,831,975

Confidence Levels

	80%	90%	95%
Lower:	-838,070,522	-2,560,483,516	-4,862,879,783
Upper:	5,441,734,473	7,164,147,466	9,466,543,733
Precision Amount:	3,139,902,498	4,862,315,491	7,164,711,758
Precision Percent:	136.41%	211.24%	311.26%
t-Value:	1.885618083164	2.919985580354	4.302652729750

Sample Type: Summary for Audit Values
Audit Name: Test01 Run 3b
Universe Size: 782,543
Sample Size: 3
Nonzero Count: 3
Creation Date: April 20, 2017
Creation Time: 01:16:00 PM
Created By: cbtek

Mean: -111,525.30
Skewness: -0.70
Total Sum: -334,575.90
Std. Deviation: 185,982.42
Std. Err. Mean: 107,376.80
Std. Err. Total: 84,026,961,058
Point Estimate: -87,273,342,838

Confidence Levels

	80%	90%	95%
Lower:	-245,716,100,083	-332,630,857,489	-448,812,176,208
Upper:	71,169,414,407	158,084,171,813	274,265,490,532
Precision Amount:	158,442,757,245	245,357,514,651	361,538,833,370
Precision Percent:	1584427524487.88%	24535751465125.11%	3615388337016.23%
t-Value:	1.885618083164	2.919985580354	4.302652729750

Sample Type: Summary for Difference Values
Audit Name: Test01 Run 3b
Universe Size: 782,543
Sample Size: 3
Nonzero Count: 3
Creation Date: April 20, 2017
Creation Time: 01:16:00 PM
Created By: cbtek

Mean: 114,466.78
Skewness: 0.70
Total Sum: 343,400.33
Std. Deviation: 189,667.73
Std. Err. Mean: 109,504.51
Std. Err. Total: 85,691,985,216
Point Estimate: 89,575,174,813

Confidence Levels

	80%	90%	95%
Lower:	-72,007,182,093	-160,644,186,371	-279,127,679,297
Upper:	251,157,531,720	339,794,535,997	458,278,028,923

Right Screenshot (VBA Code):

The VBA code in the Excel spreadsheet (VBACode - UnresVariableAppraisal.xlsm) defines the following variables:

Name	Value
Population Size	782,543
Sample Size	3
Summary for Examined Values	
Number of Nonzero Items	3
Mean	2,941.48
Standard Deviation	3,685.66
Skewness	0.70
Standard Error (Mean)	2,127.91
Standard Error (Total)	1,665,184,761
Point Estimate	2,301,831,975
Summary for Audited Values	
Number of Nonzero Items	3
Mean	-111,525.30
Standard Deviation	185,982.42
Skewness	-0.70
Standard Error (Mean)	107,376.80
Standard Error (Total)	84,026,961,058
Point Estimate	-87,273,342,838
Summary for Difference Values	
Number of Nonzero Items	3
Mean	114,466.78
Standard Deviation	189,667.73
Skewness	0.70
Standard Error (Mean)	109,504.51
Standard Error (Total)	85,691,985,216
Point Estimate	89,575,174,813

The code also defines the following variables:

Name	Value
Lower Limit	-838,070,522
Upper Limit	5,441,734,473
Precision Amount	3,139,902,498
Precision Percent	136.41%
t-Value Used	1.885618083164
Lower Limit	-245,716,100,083
Upper Limit	71,169,414,407
Precision Amount	158,442,757,245
Precision Percent	0.00%
t-Value Used	1.885618083164
Lower Limit	-72,007,182,093
Upper Limit	251,157,531,720
Precision Amount	161,582,356,907
Precision Percent	180.39%
t-Value Used	1.885618083164

Stratified Variable Appraisal

- The SVA function would be better tested in person so it is not provided here.