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**KENNESAW STATE**  
UNIVERSITY

# **Casting a fishing net for SUSHI data**

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## What is **SUSHI** and **COUNTER**?

- **SUSHI** protocol: **S**tandardized **U**sage **S**tatistics **H**arvesting Initiative
- **COUNTER** stands for **C**ounting **O**nline **U**sage of **N**etworked **E**lectronic **R**esources
  - Release 5 (R5) is the current standard
- Our LSP is Alma from ExLibris (now part of Clarivate)

# Maintenance

- The initial set-up is noteworthy.
- Maintenance is an inevitability.
- Loss of usefulness and effectiveness when a pathway breaks.
- How to minimize the time and effort needed for upkeep and maximize the impact?

# Outliers

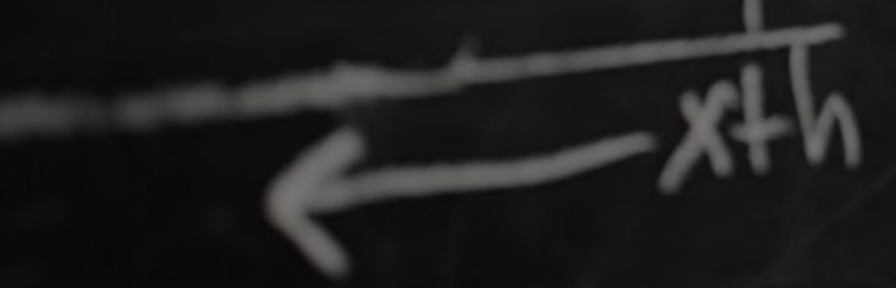
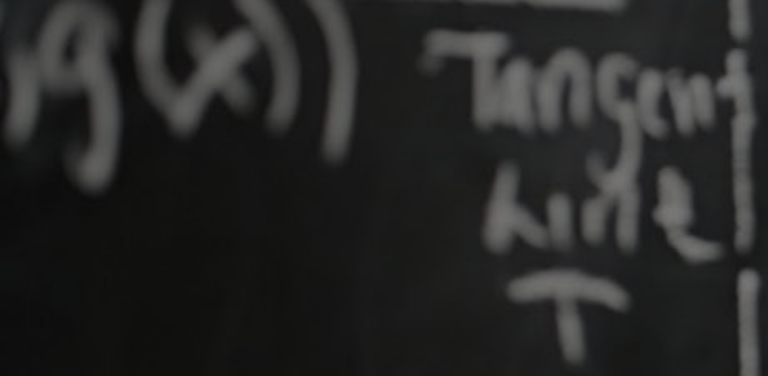
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Data points that differ significantly from others in the data set.

# Calculating Outliers

COUNTER Usage	The usage data point pulled from Alma Analytics.
Average by Platform	Average usage by each individual platform.
Standard Deviation	Difference from Average
	Difference Squared
	Variance
Upper Limit	Highest value “in range”
Lower Limit	Lowest value “in range”
Outlier	Data point that falls out of range

A	C	G	H	I	J	K	L	M	N	O	P
Platform	Year	Month	COUNTER usage Books R5	Average by Platform	Difference from Average	Difference Squared	Variance	Standard Deviation	Upper Limit	Lower Limit	Outliers?
Credo Search	2020	05-May	0	18.1	-18.1	327.8	686.4	26.2	96.7	-60.5	
Credo Search	2020	06-Jun.	1	18.1	-17.1	292.6	686.4	26.2	96.7	-60.5	
Credo Search	2020	07-Jul.	0	18.1	-18.1	327.8	686.4	26.2	96.7	-60.5	
Credo Search	2020	09-Sep.	8	18.1	-10.1	102.1	686.4	26.2	96.7	-60.5	
Credo Search	2020	10-Oct.	10	18.1	-8.1	65.7	686.4	26.2	96.7	-60.5	
Credo Search	2020	11-Nov.	9	18.1	-9.1	82.9	686.4	26.2	96.7	-60.5	
Credo Search	2020	12-Dec.	12	18.1	-6.1	37.3	686.4	26.2	96.7	-60.5	
Credo Search	2021	01-Jan.	23	18.1	4.9	24.0	686.4	26.2	96.7	-60.5	
Credo Search	2021	02-Feb.	37	18.1	18.9	357.0	686.4	26.2	96.7	-60.5	
Credo Search	2021	03-Mar.	24	18.1	5.9	34.7	686.4	26.2	96.7	-60.5	
Credo Search	2021	04-Apr.	21	18.1	2.9	8.4	686.4	26.2	96.7	-60.5	
Credo Search	2021	05-May	4	18.1	-14.1	199.0	686.4	26.2	96.7	-60.5	
Credo Search	2021	06-Jun.	2	18.1	-16.1	259.4	686.4	26.2	96.7	-60.5	
Credo Search	2021	07-Jul.	15	18.1	-3.1	9.6	686.4	26.2	96.7	-60.5	
Credo Search	2021	08-Aug.	121	18.1	102.9	10587.3	686.4	26.2	96.7	-60.5	Outlier
Credo Search	2021	09-Sep.	27	18.1	8.9	79.1	686.4	26.2	96.7	-60.5	
Credo Search	2021	10-Oct.	10	18.1	-8.1	65.7	686.4	26.2	96.7	-60.5	
Credo Search	2021	11-Nov.	15	18.1	-3.1	9.6	686.4	26.2	96.7	-60.5	
Credo Search	2021	12-Dec.	5	18.1	-13.1	171.7	686.4	26.2	96.7	-60.5	



$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

$$f(x) = \lim_{h \rightarrow 0} \frac{(x+h)^2 - x^2}{h}$$

$$= \lim_{h \rightarrow 0} \frac{x^2 + 2xh + h^2 - x^2}{h}$$

$$= \lim_{h \rightarrow 0} \frac{2xh + h^2}{h}$$

# Formulas

$$= \lim_{h \rightarrow 0} \frac{h}{h(x+h-x)}$$
$$= \lim_{h \rightarrow 0} \frac{1}{x+h-x}$$

$$= \frac{1}{2\sqrt{x}}$$

$$f(x) = \lim_{\Delta x \rightarrow 0} \frac{f(x+\Delta x) - f(x)}{\Delta x}$$

$$f(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$

# Average by Platform

A	C	G	H	I
Platform	Year	Month	COUNTER usage Books R5	Average by Platform
Credo Search	2020	05-May	0	=AVERAGEIF(A:A,"=" & A498,H:H)
Credo Search	2020	06-Jun.	1	18.1
Credo Search	2020	07-Jul.	0	18.1
Credo Search	2020	09-Sep.	8	18.1
Credo Search	2020	10-Oct.	10	18.1
Credo Search	2020	11-Nov.	9	18.1
Credo Search	2020	12-Dec.	12	18.1
Credo Search	2021	01-Jan.	23	18.1
Credo Search	2021	02-Feb.	37	18.1
Credo Search	2021	03-Mar.	24	18.1
Credo Search	2021	04-Apr.	21	18.1
Credo Search	2021	05-May	4	18.1
Credo Search	2021	06-Jun.	2	18.1
Credo Search	2021	07-Jul.	15	18.1
Credo Search	2021	08-Aug.	121	18.1
Credo Search	2021	09-Sep.	27	18.1
Credo Search	2021	10-Oct.	10	18.1
Credo Search	2021	11-Nov.	15	18.1
Credo Search	2021	12-Dec.	5	18.1



# Difference from Average

A	C	G	H	I	J
Platform	Year	Month	COUNTER usage Books R5	Average by Platform	Difference from Average
Credo Search	2020	05-May	0	18.1	=H498-I498
Credo Search	2020	06-Jun.	1	18.1	-17.1
Credo Search	2020	07-Jul.	0	18.1	-18.1
Credo Search	2020	09-Sep.	8	18.1	-10.1
Credo Search	2020	10-Oct.	10	18.1	-8.1
Credo Search	2020	11-Nov.	9	18.1	-9.1
Credo Search	2020	12-Dec.	12	18.1	-6.1
Credo Search	2021	01-Jan.	23	18.1	4.9
Credo Search	2021	02-Feb.	37	18.1	18.9
Credo Search	2021	03-Mar.	24	18.1	5.9
Credo Search	2021	04-Apr.	21	18.1	2.9
Credo Search	2021	05-May	4	18.1	-14.1
Credo Search	2021	06-Jun.	2	18.1	-16.1
Credo Search	2021	07-Jul.	15	18.1	-3.1
Credo Search	2021	08-Aug.	121	18.1	102.9
Credo Search	2021	09-Sep.	27	18.1	8.9
Credo Search	2021	10-Oct.	10	18.1	-8.1
Credo Search	2021	11-Nov.	15	18.1	-3.1
Credo Search	2021	12-Dec.	5	18.1	-13.1

# Difference Squared

A	C	G	H	I	J	K
Platform	Year	Month	COUNTER usage Books R5	Average by Platform	Difference from Average	Difference Squared
Credo Search	2020	05-May	0	18.1	-18.1	=J498*J498
Credo Search	2020	06-Jun.	1	18.1	-17.1	292.6
Credo Search	2020	07-Jul.	0	18.1	-18.1	327.8
Credo Search	2020	09-Sep.	8	18.1	-10.1	102.1
Credo Search	2020	10-Oct.	10	18.1	-8.1	65.7
Credo Search	2020	11-Nov.	9	18.1	-9.1	82.9
Credo Search	2020	12-Dec.	12	18.1	-6.1	37.3
Credo Search	2021	01-Jan.	23	18.1	4.9	24.0
Credo Search	2021	02-Feb.	37	18.1	18.9	357.0
Credo Search	2021	03-Mar.	24	18.1	5.9	34.7
Credo Search	2021	04-Apr.	21	18.1	2.9	8.4
Credo Search	2021	05-May	4	18.1	-14.1	199.0
Credo Search	2021	06-Jun.	2	18.1	-16.1	259.4
Credo Search	2021	07-Jul.	15	18.1	-3.1	9.6
Credo Search	2021	08-Aug.	121	18.1	102.9	10587.3
Credo Search	2021	09-Sep.	27	18.1	8.9	79.1
Credo Search	2021	10-Oct.	10	18.1	-8.1	65.7
Credo Search	2021	11-Nov.	15	18.1	-3.1	9.6
Credo Search	2021	12-Dec.	5	18.1	-13.1	171.7

# Variance

A	C	G	H	I	J	K	L
Platform	Year	Month	COUNTER usage Books R5	Average by Platform	Difference from Average	Difference Squared	Variance
Credo Search	2020	05-May	0	18.1	-18.1	327.8	=AVERAGEIF(A:A,"=" & A498,K:K)
Credo Search	2020	06-Jun.	1	18.1	-17.1	292.6	686.4
Credo Search	2020	07-Jul.	0	18.1	-18.1	327.8	686.4
Credo Search	2020	09-Sep.	8	18.1	-10.1	102.1	686.4
Credo Search	2020	10-Oct.	10	18.1	-8.1	65.7	686.4
Credo Search	2020	11-Nov.	9	18.1	-9.1	82.9	686.4
Credo Search	2020	12-Dec.	12	18.1	-6.1	37.3	686.4
Credo Search	2021	01-Jan.	23	18.1	4.9	24.0	686.4
Credo Search	2021	02-Feb.	37	18.1	18.9	357.0	686.4
Credo Search	2021	03-Mar.	24	18.1	5.9	34.7	686.4
Credo Search	2021	04-Apr.	21	18.1	2.9	8.4	686.4
Credo Search	2021	05-May	4	18.1	-14.1	199.0	686.4
Credo Search	2021	06-Jun.	2	18.1	-16.1	259.4	686.4
Credo Search	2021	07-Jul.	15	18.1	-3.1	9.6	686.4
Credo Search	2021	08-Aug.	121	18.1	102.9	10587.3	686.4
Credo Search	2021	09-Sep.	27	18.1	8.9	79.1	686.4
Credo Search	2021	10-Oct.	10	18.1	-8.1	65.7	686.4
Credo Search	2021	11-Nov.	15	18.1	-3.1	9.6	686.4
Credo Search	2021	12-Dec.	5	18.1	-13.1	171.7	686.4

# Standard Deviation

A	C	G	H	I	J	K	L	M
Platform	Year	Month	COUNTER usage Books R5	Average by Platform	Difference from Average	Difference Squared	Variance	Standard Deviation
Credo Search	2020	05-May	0	18.1	-18.1	327.8	686.4	=SQRT(L498)
Credo Search	2020	06-Jun.	1	18.1	-17.1	292.6	686.4	26.2
Credo Search	2020	07-Jul.	0	18.1	-18.1	327.8	686.4	26.2
Credo Search	2020	09-Sep.	8	18.1	-10.1	102.1	686.4	26.2
Credo Search	2020	10-Oct.	10	18.1	-8.1	65.7	686.4	26.2
Credo Search	2020	11-Nov.	9	18.1	-9.1	82.9	686.4	26.2
Credo Search	2020	12-Dec.	12	18.1	-6.1	37.3	686.4	26.2
Credo Search	2021	01-Jan.	23	18.1	4.9	24.0	686.4	26.2
Credo Search	2021	02-Feb.	37	18.1	18.9	357.0	686.4	26.2
Credo Search	2021	03-Mar.	24	18.1	5.9	34.7	686.4	26.2
Credo Search	2021	04-Apr.	21	18.1	2.9	8.4	686.4	26.2
Credo Search	2021	05-May	4	18.1	-14.1	199.0	686.4	26.2
Credo Search	2021	06-Jun.	2	18.1	-16.1	259.4	686.4	26.2
Credo Search	2021	07-Jul.	15	18.1	-3.1	9.6	686.4	26.2
Credo Search	2021	08-Aug.	121	18.1	102.9	10587.3	686.4	26.2
Credo Search	2021	09-Sep.	27	18.1	8.9	79.1	686.4	26.2
Credo Search	2021	10-Oct.	10	18.1	-8.1	65.7	686.4	26.2
Credo Search	2021	11-Nov.	15	18.1	-3.1	9.6	686.4	26.2
Credo Search	2021	12-Dec.	5	18.1	-13.1	171.7	686.4	26.2

# Upper Limit

A	C	G	H	I	J	K	L	M	N
Platform	Year	Month	COUNTER usage Books R5	Average by Platform	Difference from Average	Difference Squared	Variance	Standard Deviation	Upper Limit
Credo Search	2020	05-May	0	18.1	-18.1	327.8	686.4	26.2	=I498+(3*M498)
Credo Search	2020	06-Jun.	1	18.1	-17.1	292.6	686.4	26.2	96.7
Credo Search	2020	07-Jul.	0	18.1	-18.1	327.8	686.4	26.2	96.7
Credo Search	2020	09-Sep.	8	18.1	-10.1	102.1	686.4	26.2	96.7
Credo Search	2020	10-Oct.	10	18.1	-8.1	65.7	686.4	26.2	96.7
Credo Search	2020	11-Nov.	9	18.1	-9.1	82.9	686.4	26.2	96.7
Credo Search	2020	12-Dec.	12	18.1	-6.1	37.3	686.4	26.2	96.7
Credo Search	2021	01-Jan.	23	18.1	4.9	24.0	686.4	26.2	96.7
Credo Search	2021	02-Feb.	37	18.1	18.9	357.0	686.4	26.2	96.7
Credo Search	2021	03-Mar.	24	18.1	5.9	34.7	686.4	26.2	96.7
Credo Search	2021	04-Apr.	21	18.1	2.9	8.4	686.4	26.2	96.7
Credo Search	2021	05-May	4	18.1	-14.1	199.0	686.4	26.2	96.7
Credo Search	2021	06-Jun.	2	18.1	-16.1	259.4	686.4	26.2	96.7
Credo Search	2021	07-Jul.	15	18.1	-3.1	9.6	686.4	26.2	96.7
Credo Search	2021	08-Aug.	121	18.1	102.9	10587.3	686.4	26.2	96.7
Credo Search	2021	09-Sep.	27	18.1	8.9	79.1	686.4	26.2	96.7
Credo Search	2021	10-Oct.	10	18.1	-8.1	65.7	686.4	26.2	96.7
Credo Search	2021	11-Nov.	15	18.1	-3.1	9.6	686.4	26.2	96.7
Credo Search	2021	12-Dec.	5	18.1	-13.1	171.7	686.4	26.2	96.7

# Lower Limit

A	C	G	H	I	J	K	L	M	N	O
Platform	Year	Month	COUNTER usage Books R5	Average by Platform	Difference from Average	Difference Squared	Variance	Standard Deviation	Upper Limit	Lower Limit
Credo Search	2020	05-May	0	18.1	-18.1	327.8	686.4	26.2	96.7	=I498-(3*M498)
Credo Search	2020	06-Jun.	1	18.1	-17.1	292.6	686.4	26.2	96.7	-60.5
Credo Search	2020	07-Jul.	0	18.1	-18.1	327.8	686.4	26.2	96.7	-60.5
Credo Search	2020	09-Sep.	8	18.1	-10.1	102.1	686.4	26.2	96.7	-60.5
Credo Search	2020	10-Oct.	10	18.1	-8.1	65.7	686.4	26.2	96.7	-60.5
Credo Search	2020	11-Nov.	9	18.1	-9.1	82.9	686.4	26.2	96.7	-60.5
Credo Search	2020	12-Dec.	12	18.1	-6.1	37.3	686.4	26.2	96.7	-60.5
Credo Search	2021	01-Jan.	23	18.1	4.9	24.0	686.4	26.2	96.7	-60.5
Credo Search	2021	02-Feb.	37	18.1	18.9	357.0	686.4	26.2	96.7	-60.5
Credo Search	2021	03-Mar.	24	18.1	5.9	34.7	686.4	26.2	96.7	-60.5
Credo Search	2021	04-Apr.	21	18.1	2.9	8.4	686.4	26.2	96.7	-60.5
Credo Search	2021	05-May	4	18.1	-14.1	199.0	686.4	26.2	96.7	-60.5
Credo Search	2021	06-Jun.	2	18.1	-16.1	259.4	686.4	26.2	96.7	-60.5
Credo Search	2021	07-Jul.	15	18.1	-3.1	9.6	686.4	26.2	96.7	-60.5
Credo Search	2021	08-Aug.	121	18.1	102.9	10587.3	686.4	26.2	96.7	-60.5
Credo Search	2021	09-Sep.	27	18.1	8.9	79.1	686.4	26.2	96.7	-60.5
Credo Search	2021	10-Oct.	10	18.1	-8.1	65.7	686.4	26.2	96.7	-60.5
Credo Search	2021	11-Nov.	15	18.1	-3.1	9.6	686.4	26.2	96.7	-60.5
Credo Search	2021	12-Dec.	5	18.1	-13.1	171.7	686.4	26.2	96.7	-60.5

# Outlier

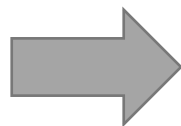
A	C	G	H	I	J	K	L	M	N	O	P
Platform	Year	Month	COUNTER usage Books R5	Average by Platform	Difference from Average	Difference Squared	Variance	Standard Deviation	Upper Limit	Lower Limit	Outliers?
Credo Search	2020	05-May	0	18.1	-18.1	327.8	686.4	26.2	96.7	-60.5	=IFNA((IFS(H498>N498,"Outlier",H498<O498,"Outlier")), "")
Credo Search	2020	06-Jun.	1	18.1	-17.1	292.6	686.4	26.2	96.7	-60.5	
Credo Search	2020	07-Jul.	0	18.1	-18.1	327.8	686.4	26.2	96.7	-60.5	
Credo Search	2020	09-Sep.	8	18.1	-10.1	102.1	686.4	26.2	96.7	-60.5	
Credo Search	2020	10-Oct.	10	18.1	-8.1	65.7	686.4	26.2	96.7	-60.5	
Credo Search	2020	11-Nov.	9	18.1	-9.1	82.9	686.4	26.2	96.7	-60.5	
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Credo Search	2021	04-Apr.	21	18.1	2.9	8.4	686.4	26.2	96.7	-60.5	
Credo Search	2021	05-May	4	18.1	-14.1	199.0	686.4	26.2	96.7	-60.5	
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Credo Search	2021	07-Jul.	15	18.1	-3.1	9.6	686.4	26.2	96.7	-60.5	
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Credo Search	2021	09-Sep.	27	18.1	8.9	79.1	686.4	26.2	96.7	-60.5	
Credo Search	2021	10-Oct.	10	18.1	-8.1	65.7	686.4	26.2	96.7	-60.5	
Credo Search	2021	11-Nov.	15	18.1	-3.1	9.6	686.4	26.2	96.7	-60.5	
Credo Search	2021	12-Dec.	5	18.1	-13.1	171.7	686.4	26.2	96.7	-60.5	





# Maintenance

A	C	G	H
Platform	Year	Month	COUNTER usage Books R5
Credo Search	2020	05-May	0
Credo Search	2020	06-Jun.	1
Credo Search	2020	07-Jul.	0
Credo Search	2020	09-Sep.	8
Credo Search	2020	10-Oct.	10
Credo Search	2020	11-Nov.	9
Credo Search	2020	12-Dec.	12
Credo Search	2021	01-Jan.	23
Credo Search	2021	02-Feb.	37
Credo Search	2021	03-Mar.	24
Credo Search	2021	04-Apr.	21
Credo Search	2021	05-May	4
Credo Search	2021	06-Jun.	2
Credo Search	2021	07-Jul.	15
Credo Search	2021	08-Aug.	121
Credo Search	2021	09-Sep.	27
Credo Search	2021	10-Oct.	10
Credo Search	2021	11-Nov.	15
Credo Search	2021	12-Dec.	5



I	J	K	L	M	N	O	P
Average by Platform	Difference from Average	Difference Squared	Variance	Standard Deviation	Upper Limit	Lower Limit	Outliers?
18.1	-18.1	327.8	686.4	26.2	96.7	-60.5	
18.1	-17.1	292.6	686.4	26.2	96.7	-60.5	
18.1	-18.1	327.8	686.4	26.2	96.7	-60.5	
18.1	-10.1	102.1	686.4	26.2	96.7	-60.5	
18.1	-8.1	65.7	686.4	26.2	96.7	-60.5	
18.1	-9.1	82.9	686.4	26.2	96.7	-60.5	
18.1	-6.1	37.3	686.4	26.2	96.7	-60.5	
18.1	4.9	24.0	686.4	26.2	96.7	-60.5	
18.1	18.9	357.0	686.4	26.2	96.7	-60.5	
18.1	5.9	34.7	686.4	26.2	96.7	-60.5	
18.1	2.9	8.4	686.4	26.2	96.7	-60.5	
18.1	-14.1	199.0	686.4	26.2	96.7	-60.5	
18.1	-16.1	259.4	686.4	26.2	96.7	-60.5	
18.1	-3.1	9.6	686.4	26.2	96.7	-60.5	
18.1	102.9	10587.3	686.4	26.2	96.7	-60.5	Outlier
18.1	8.9	79.1	686.4	26.2	96.7	-60.5	
18.1	-8.1	65.7	686.4	26.2	96.7	-60.5	
18.1	-3.1	9.6	686.4	26.2	96.7	-60.5	
18.1	-13.1	171.7	686.4	26.2	96.7	-60.5	

# Finding Outliers by Vendor

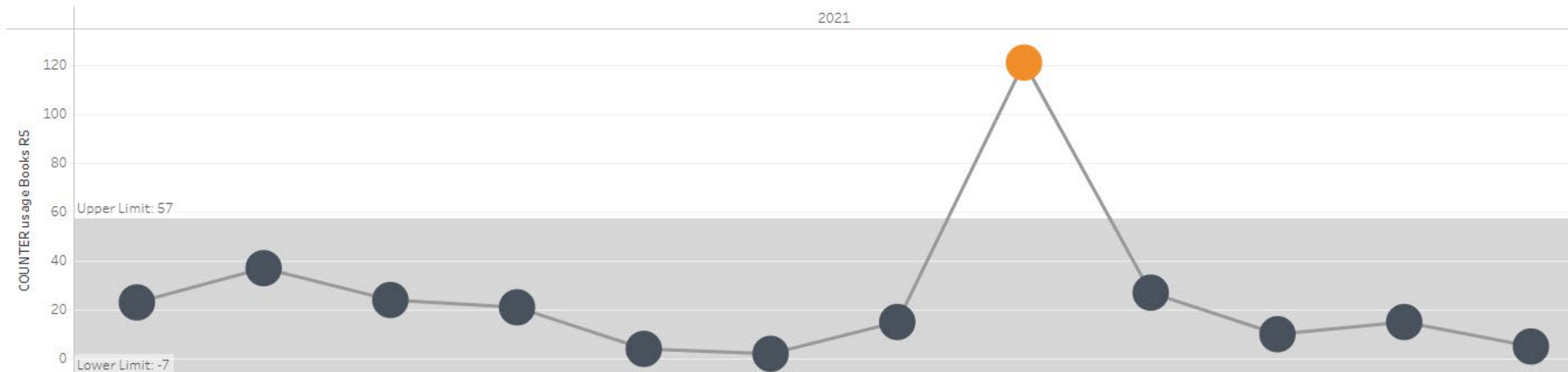
\*Click on a platform name to filter the time-series by that platform

Outliers  
■ True  
■ False

Usage Date Year

Platform	Usage Date Year / Month Num and Name											
	01-Jan.	02-Feb.	03-Mar.	04-Apr.	05-May	06-Jun.	07-Jul.	08-Aug.	09-Sep.	10-Oct.	11-Nov.	12-Dec.
CabellsInt	0	0	0	0								
Cambridge Core	6	12	5	5	7	1	0	10	4	10	47	9
charleston				0			0					
Cochrane	0	0	0	0	0	0	0	0	0	0	0	0
connect	0		0	0	0	0	0					
CQ Press Library	0	7	1	0	0	0	0	0	1	5	4	0
<b>Credo Search</b>	23	37	24	21	4	2	15	121	27	10	15	5
Data Planet	0		0	0	0	0	0	0	0	0	0	0
De Gruyter Platform		0	0	0								
DramaOnline	0	0	0		0	0	0	0	0		0	0

## Outlier Check Timeseries



# Excel vs. Alma

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# ***Casting a fishing net for SUSHI data***

## **Q & A**

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