LOGPOINT

Integrations

Evaluation Process Plugin

*V*5.0.0

CONTENTS

CHAPTER

ONE

EVALUATION PROCESS PLUGIN

Evaluation Process Plugin enables you to use the eval process command. The process command evaluates mathematical, boolean and string expressions during a LogPoint search and places the result of the evaluation in an identifier as a new field.

Syntax:

```
| process eval("identifier=expression")
```

- **Expression**: An expression is a combination of numbers, variables, operators, functions, brackets and punctuation marks that are grouped to represent a value.
- **Identifier**: An identifier contains the result of the evaluation of expressions.

Note:

- Make sure the name of the identifier is not the same as an existing field name. If the same name is used Logpoint discards the value of the identifier.
- While using a string value in an eval expression, always place the string within single quotes (‘’).
- An eval expression also uses an existing key from an event.
- An invalid expression or syntax mismatch does not generate any exception or error.

Example:

```
| process eval("Revenue=unit_sold*Selling_price")
```

The above example calculates the value of *Revenue* by multiplying the values of *unit_sold* and *Selling_price*.

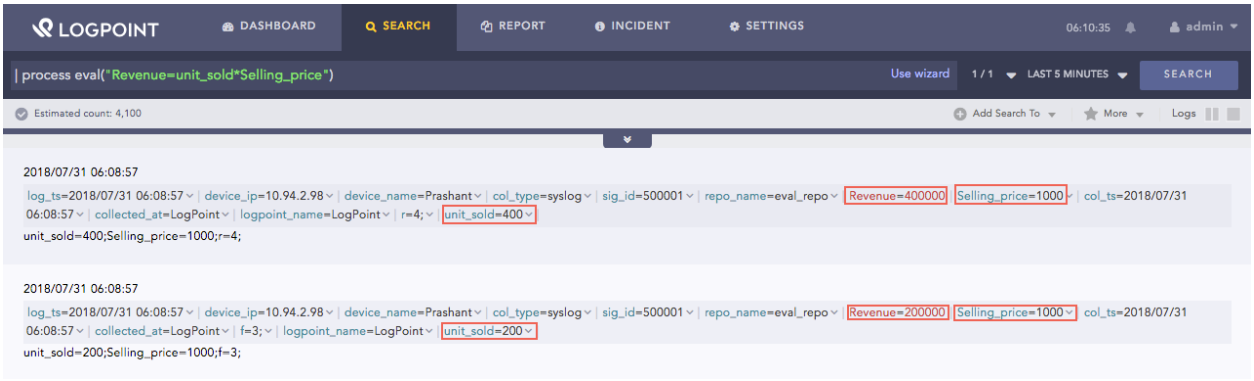


Fig. 1: Eval Expression

CHAPTER

TWO

ARITHMETIC EXPRESSIONS

An **Arithmetic expression** is the combination of numbers, operators and variables that results in a numeric value.

Generic Syntax:

```
| process eval("identifier = first_operand arithmetic_operator second_operand")
```

2.1 Addition (+)

This function accepts numerical values as inputs for **addition** and generates the output in the destination field (identifier).

Example:

```
| process eval("total_datasize=request_datasize+response_datasize")
| fields request_datasize, response_datasize, total_datasize
```

The above example calculates the value of the *total_datasize* identifier by adding the values of the *request_datasize* and *response_datasize* fields.

The *fields* command displays the corresponding values of all the three fields in a tabular form.

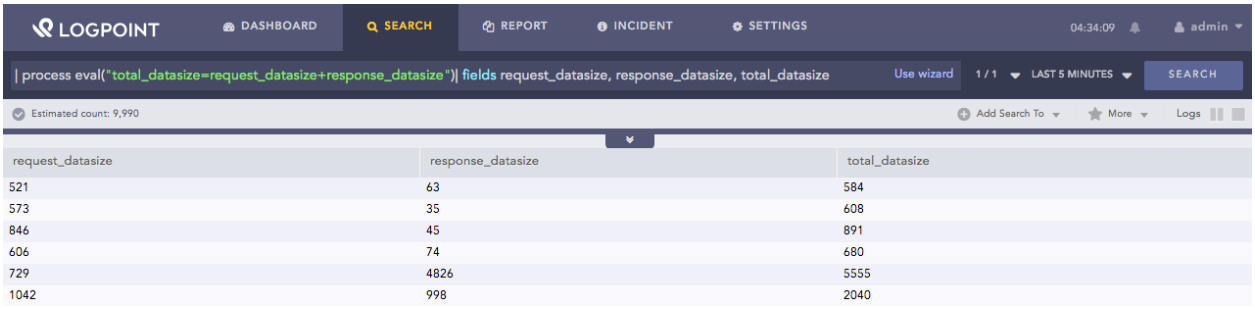


Fig. 1: Addition function

Note: The **Addition** function also accepts string values as inputs and returns the concatenation of values as the output.

2.2 Subtraction (-)

This function accepts numerical values as inputs for **subtraction** and generates the output in the destination field (identifier).

Example:

```
| process eval("difference_in_datasize=request_datasize-response_datasize")
| fields request_datasize, response_datasize, difference_in_datasize
```

The above example calculates the value of the *difference_in_datasize* identifier by subtracting the values of the *response_datasize* field from the *request_datasize* field.

The *fields* command displays the corresponding values of all the three fields in a tabular form.

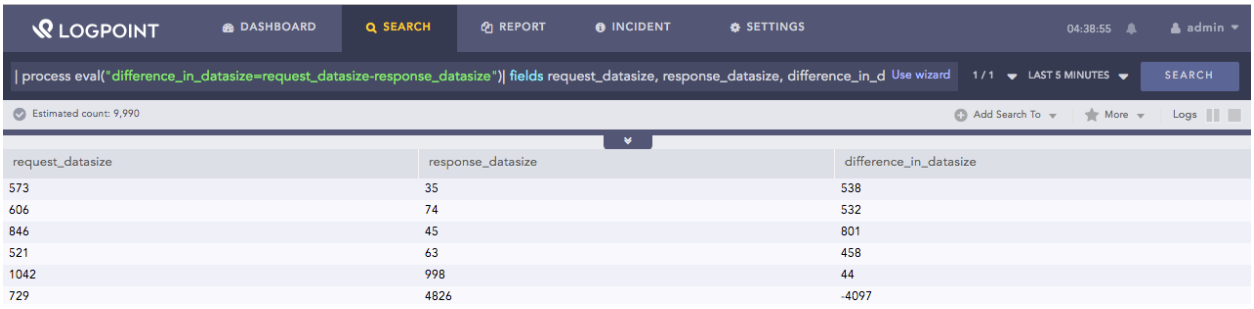


Fig. 2: Subtraction function

2.3 Multiplication (*)

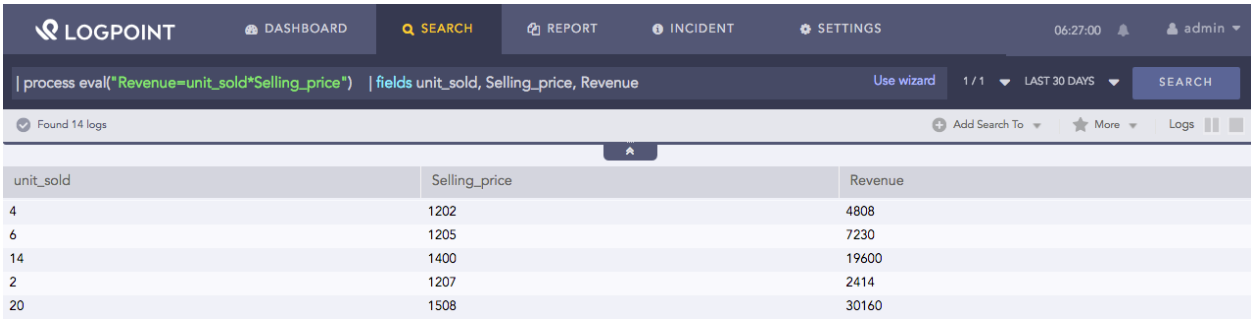
This function accepts numerical values as inputs for **multiplication** and generates the output in the destination field (identifier).

Example:

```
| process eval("Revenue=unit_sold*Selling_price")
| fields unit_sold, Selling_price, Revenue
```

The above example calculates the value of the *Revenue* identifier by multiplying the values of the *unit_sold* and *Selling_price* fields.

The *fields* command displays the corresponding values of all the three fields in a tabular form.



unit_sold	Selling_price	Revenue
4	1202	4808
6	1205	7230
14	1400	19600
2	1207	2414
20	1508	30160

Fig. 3: Multiplication function

2.4 Division (/)

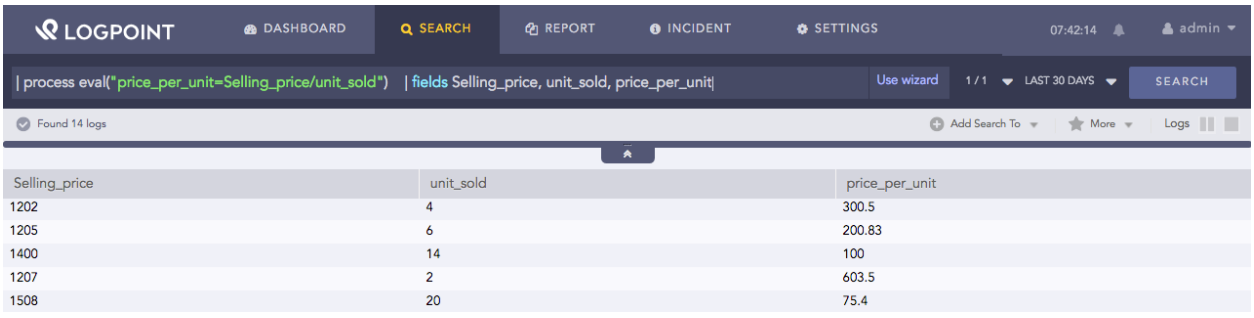
This function accepts numerical values as inputs for the **division** and generates the output in the destination field (identifier).

Example:

```
| process eval("price_per_unit=Selling_price/unit_sold")
| fields Selling_price, unit_sold, price_per_unit
```

The above example calculates the value of the *price_per_unit* identifier by dividing the values of the *unit_sold* and *Selling_price* fields.

The *fields* command displays the corresponding values of all the three fields in a tabular form.



Selling_price	unit_sold	price_per_unit
1202	4	300.5
1205	6	200.83
1400	14	100
1207	2	603.5
1508	20	75.4

Fig. 4: Division function

2.5 Modulus (%)

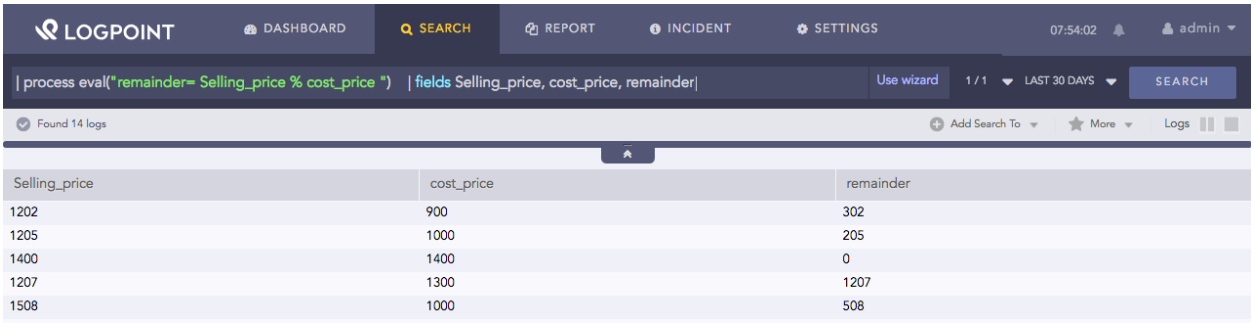
This function accepts numerical values as inputs for the division and generates the remainder of the division as the output in the destination field (identifier).

Example:

```
process eval("modulo= Selling_price % cost_price ")
fields Selling_price, cost_price, remainder
```

The above example calculates the value of the *modulo* identifier by finding the remainder after dividing the value of the *Selling_price* field by *cost_price* field.

The *fields* command displays the corresponding values of all the three fields in a tabular form.



Selling_price	cost_price	remainder
1202	900	302
1205	1000	205
1400	1400	0
1207	1300	1207
1508	1000	508

Fig. 5: Modulus function

2.6 Power (^)

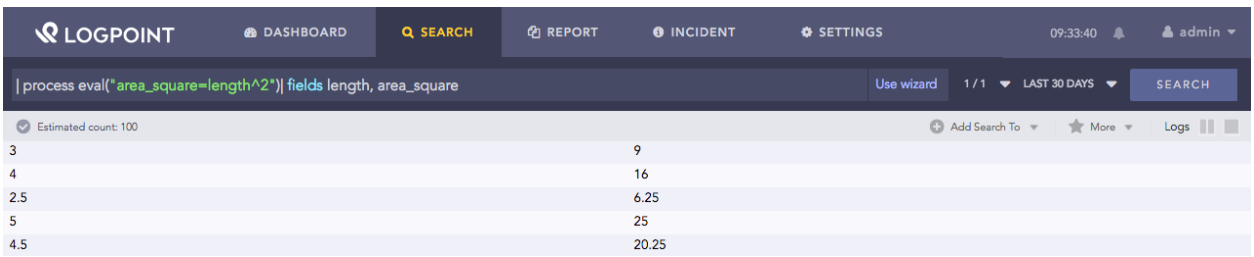
This function accepts numerical values as inputs for the **power** operation and generates the output in the destination field (identifier).

Example:

```
process eval("area_square=length^2")
fields length, area_square
```

The above example calculates the value of the *area_square* identifier by squaring the value of the *length* field.

The *fields* command displays the corresponding values of the two fields in a tabular form.



3	9
4	16
2.5	6.25
5	25
4.5	20.25

Fig. 6: Power function

CHAPTER

THREE

RELATIONAL EXPRESSIONS

The Relational expression is an expression that returns a boolean value, True or False, based on whether the relation specified by the relational operator is satisfied or not.

Generic syntax:

```
process eval("identifier = first_operand relational_operator second_operand")
```

3.1 Less than (<)

This function compares two operands. It returns True if the first operand is less than the second operand, or False if the first operand is greater than the second.

Example:

```
process eval("is_loss=Selling_price<cost_price")
chart count() by Selling_price, cost_price, is_loss
```

The above example compares the values of the *cost_price* and *Selling_price* fields. It returns *true* in the *is_loss* identifier if the *cost_price* is less than the *Selling_price* or returns false if the *cost price* is greater.

The *chart count()* command displays the *count* of the combination of *cost_price* and *Selling_price* values as a chart and in a tabular form.

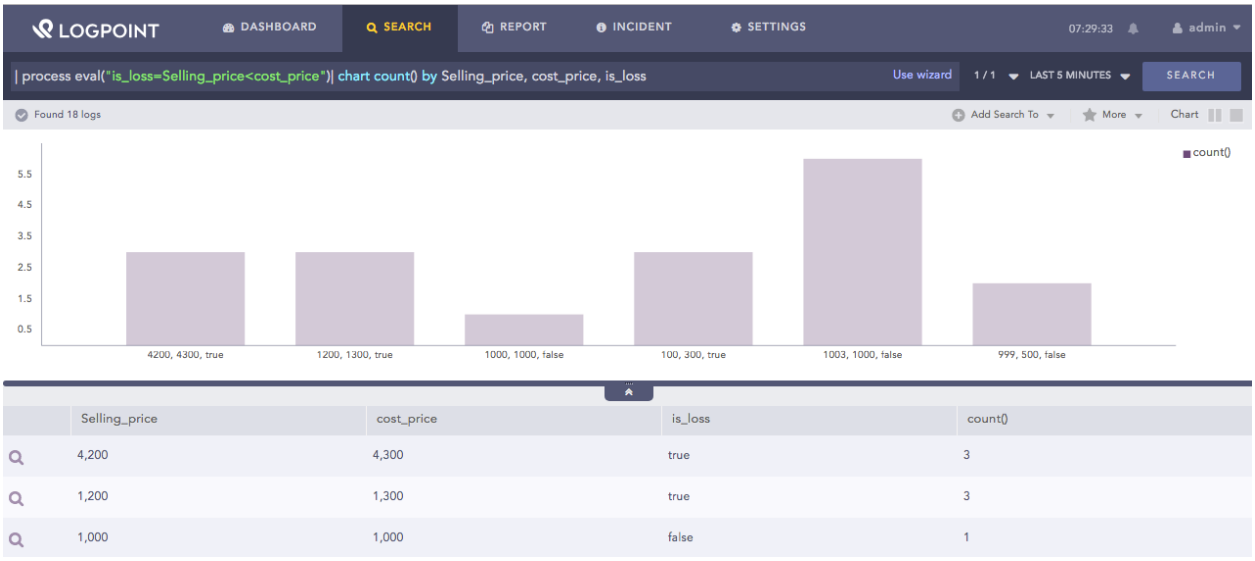


Fig. 1: Less than function

3.2 Greater than (>)

This function compares two operands. It returns True if the first operand is greater than the second operand or returns False if the first operand is less than the second.

Example:

```
| process eval("is_profit=Selling_price>cost_price")
| chart count() by Selling_price, cost_price, is_profit
```

The above example compares the values of the *Selling_price* and *cost_price* fields. It returns *true* in the *is_profit* identifier if the *Selling_price* is greater than the *cost_price*, else returns *false*.

The *chart count()* command displays the *count* of the combination of *Selling_price*, *cost_price*, and *is_profit* values as a chart and in a tabular form.

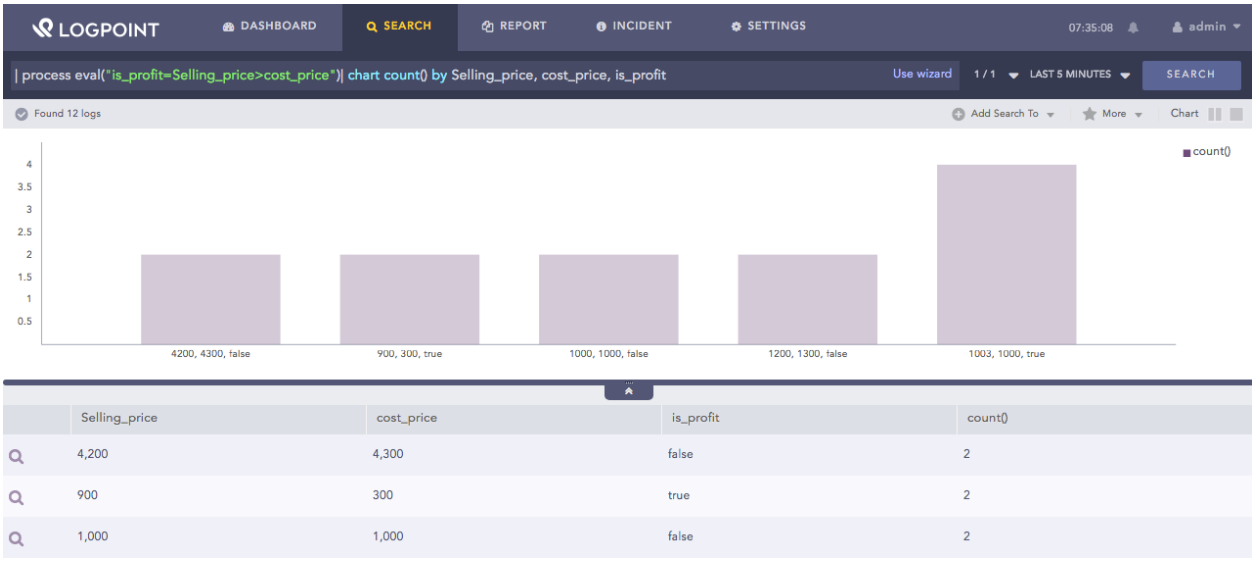


Fig. 2: Greater than function

3.3 Less than or equal to (<=)

This function compares two operands. It returns *True* if the first operand is **less than or equal to** the second operand, else returns *False*.

Example:

```
| process eval("is_less_discount=discount<=50")
| chart count() by discount, is_less_discount
```

The above example compares the value of the *discount* field with 50. It returns *true* in the *is_less_discount* identifier if the *discount* is less than or equal to 50, else returns *false*.

The *chart count()* command displays the *count* of the combination of *discount* and *is_less_discount* values as a chart and in a tabular form.

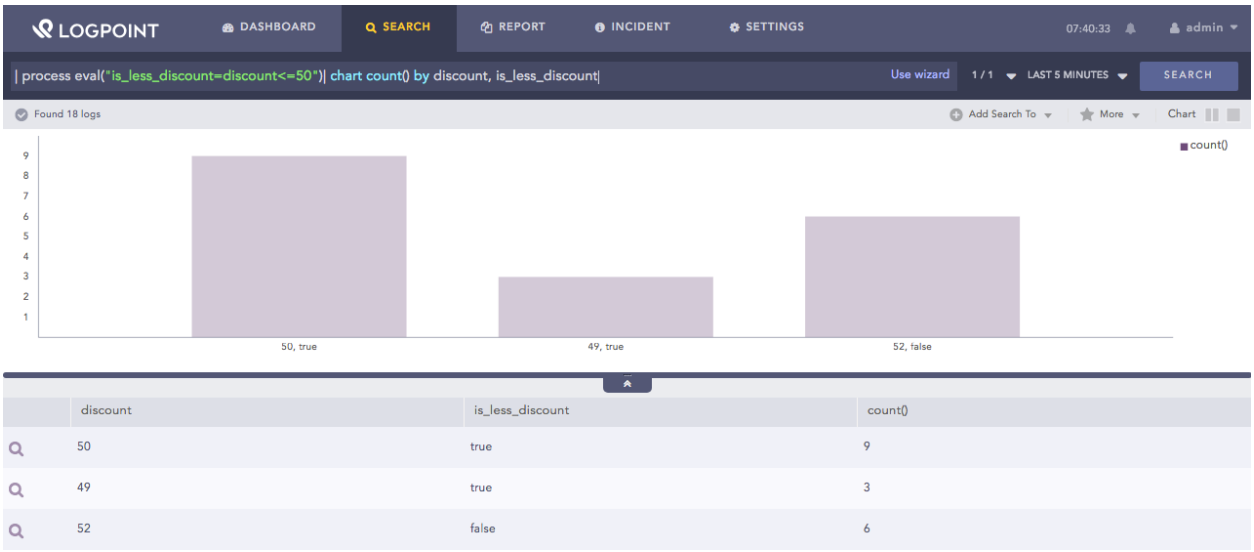


Fig. 3: Less than or equals function

3.4 Greater than or equal to (>=)

This function compares two operands. It returns *True* if the first operand is **greater than or equal to** the second operand, else returns *False*.

Example:

```
| process eval("is_more_discount=discount>=51")
| chart count() by discount, is_more_discount
```

The above example compares the value of the *discount* field with 51. It returns *true* in the *is_more_discount* identifier if the *discount* is greater than or equal to 51, else returns *false*.

The *chart count()* command displays the *count* of the combination of *discount* and *is_more_discount* values as a chart and in a tabular form.

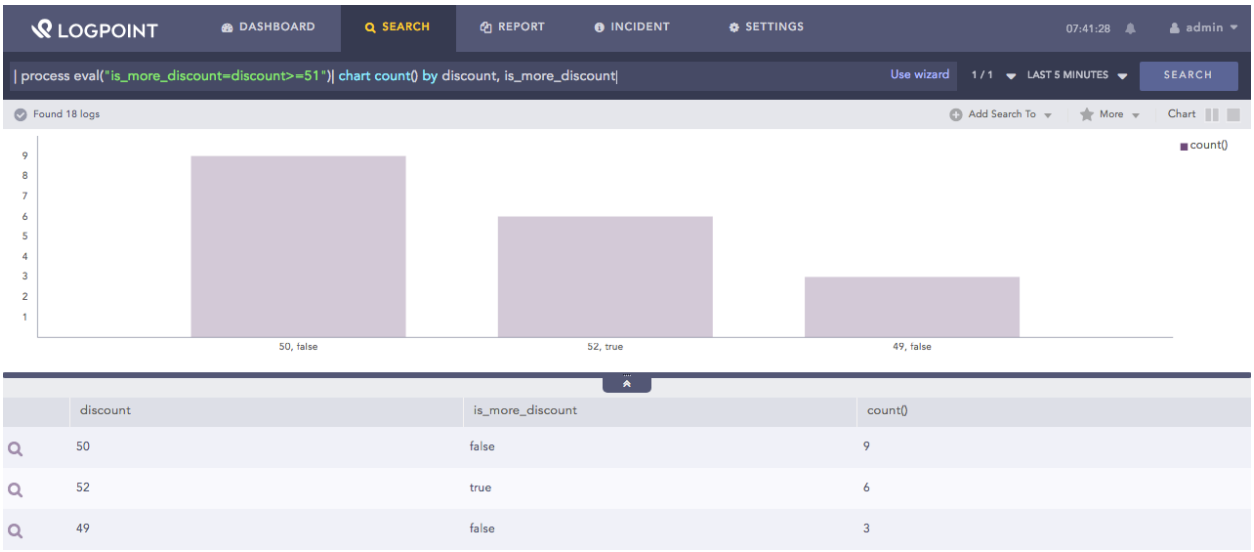


Fig. 4: Greater than or equals function

3.5 Not equal to (!=)

This function compares two operands. It returns *True* if the first operand is **not equal to** the second operand, else returns *False*.

Example:

```
| process eval("is_profit_or_loss=Selling_price!=cost_price")
| chart count() by Selling_price, cost_price, is_profit_or_loss
```

The above example compares the value of the *Selling_price* field with the *cost_price* field. It returns *true* in the *is_profit_or_loss* identifier if the *Selling_price* is not equal to the *cost_price*, else returns *false*.

The *chart count()* command displays the *count* of the combination of *Selling_price*, *cost_price*, and *is_profit_or_loss* values as a chart and in a tabular form.

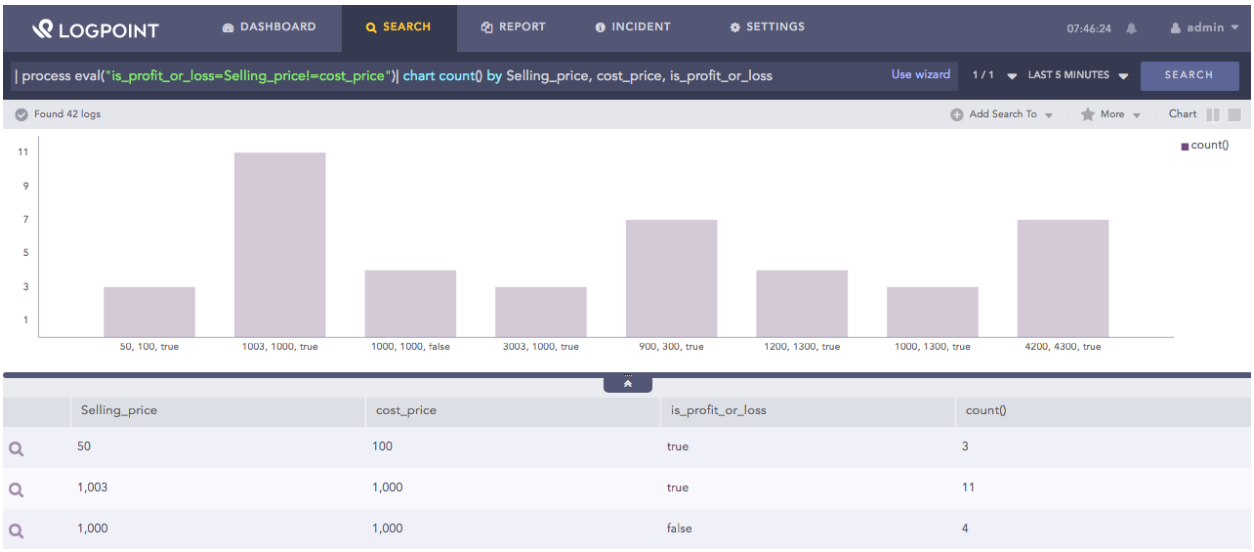


Fig. 5: Not equals function

3.6 Equal to (==)

This function compares two operands. It returns *True* if the first operand is **equal to** the second operand, else returns *False*.

Example:

```
| process eval("no_profit_or_loss=Selling_price==cost_price")
| chart count() by Selling_price, cost_price, no_profit_or_loss
```

The above example compares the value of the *Selling_price* field with the *cost_price* field. It returns *true* in the *no_profit_or_loss* identifier if the *Selling_price* is equal to the *cost_price*, else returns *false*.

The *chart count()* command displays the *count* of the combination of *Selling_price*, *cost_price*, and *no_profit_or_loss* values as a chart and in a tabular form.

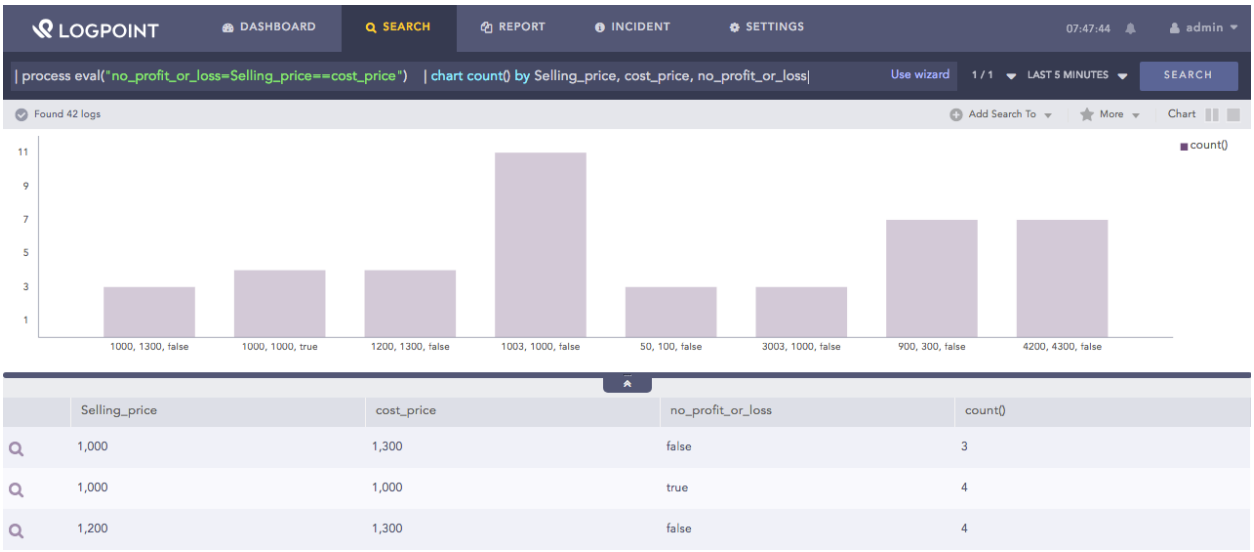


Fig. 6: Equals function

CHAPTER

FOUR

LOGICAL EXPRESSIONS

The **Logical expression** compares two boolean values and returns either *True* or *False*.

Generic syntax:

```
| process eval("identifier = first_operand logical_operator second_operand")
```

4.1 AND (&&)

This function compares two boolean values. It returns *True* if both both the values are true. If they are not it returns *False*.

Example:

```
| process eval("is_profit=Selling_price>cost_price") | process eval("is_more_discount=discount>
↪=51")
| process eval("is_more_profit=is_profit && is_more_discount")
| chart count() by is_profit, is_more_discount, is_more_profit
```

The above example first returns either *true* or *false* in the *is_profit* identifier by comparing whether the value of the *Selling_price* field is greater than the value of the *cost_price* field. It then returns *true* or *false* in the *is_more_discount* identifier by comparing if the value of the *discount* field is greater than or equal to 51. Then it compares the values of *is_profit* and *is_more_discount* fields. It returns *true* in the *is_more_profit* identifier if both the values are true, else returns *false*.

The *chart count()* command displays the *count* of the combination of *is_profit*, *is_more_discount*, and *is_more_profit* values as a chart and in a tabular form.

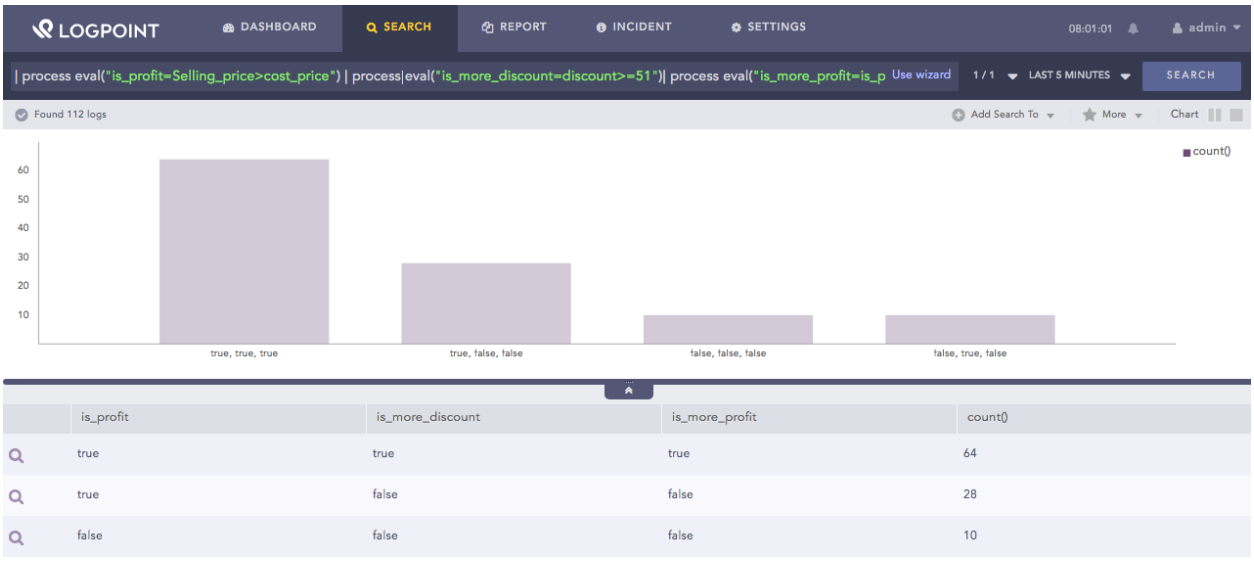


Fig. 1: AND function

4.2 OR (||)

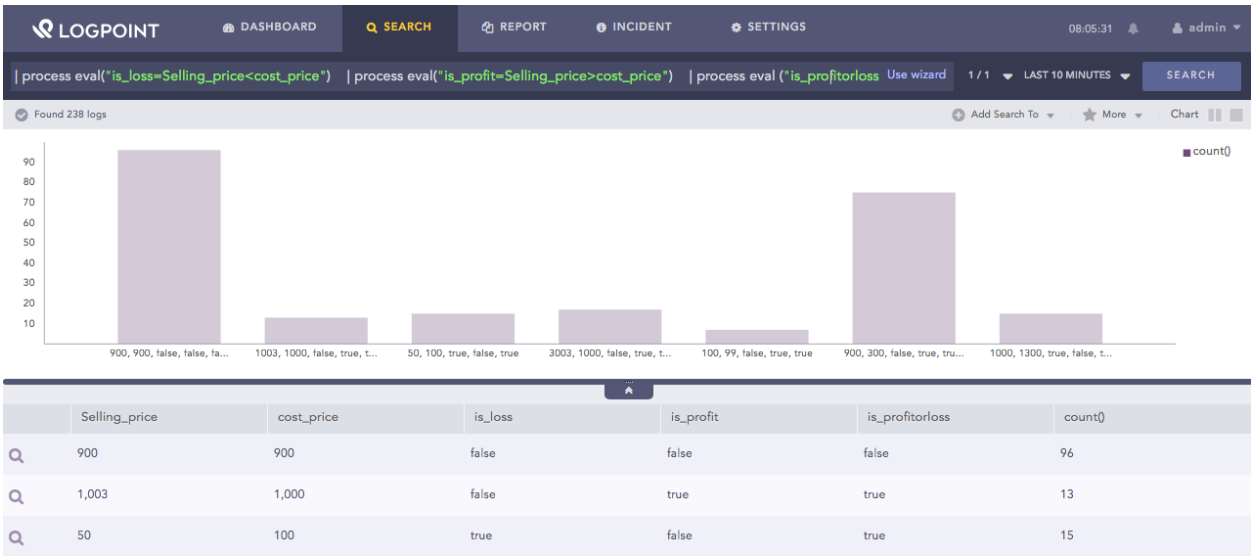
This function compares two boolean values. It returns *True* if either value is true. If none of the values are true, it returns *False*.

Example:

```
| process eval("is_loss=Selling_price<cost_price")
| process eval("is_profit=Selling_price>cost_price")
| process eval ("is_profitorloss = is_loss || is_profit ")
| chart count() by Selling_price, cost_price, is_loss, is_profit, is_profitorloss
```

The above example first returns *true* or *false* in the *is_loss* identifier by comparing if the value of the *Selling_price* field is less than the value of the *cost_price* field. It then returns *true* or *false* in the *is_profit* identifier by comparing if the value of the *Selling_price* field is greater than the value of the *cost_price* field. Then it compares the values of *is_loss* and *is_profit* fields. It returns *true* in the *is_profitorloss* identifier if either value is *true*, else returns *false*.

The *chart count()* command displays the *count* of the combination of *Selling_price*, *cost_price*, *is_loss*, *is_profit*, and *is_profitorloss* values as a chart and in a tabular form.



	Selling_price	cost_price	is_loss	is_profit	is_profitorloss	count()
	900	900	false	false	false	96
	1,003	1,000	false	true	true	13
	50	100	true	false	true	15

Fig. 2: OR function

CHAPTER

FIVE

CONDITIONAL AND COMPARISON FUNCTIONS

The **Conditional and Comparison functions** evaluate conditions and compare values.

5.1 If Statement

This function accepts a *condition* and a string value *X*. It compares the given *condition*; if the *condition* is true, it returns the value provided in *X*.

Syntax:

```
| process eval("identifier=if(condition) {return X}")
```

Example:

```
| process eval("User_severity=if(risk_score >= 5) {return 'Risk user'}")
| chart count() by risk_score, User_severity
```

The above example returns *Risk user* in the *User_severity* identifier if the value of the *risk_score* field is greater than or equal to 5.

The *chart count()* command displays the *count* of the combination of *risk_score* and *User_severity* values as a chart and in a tabular form.

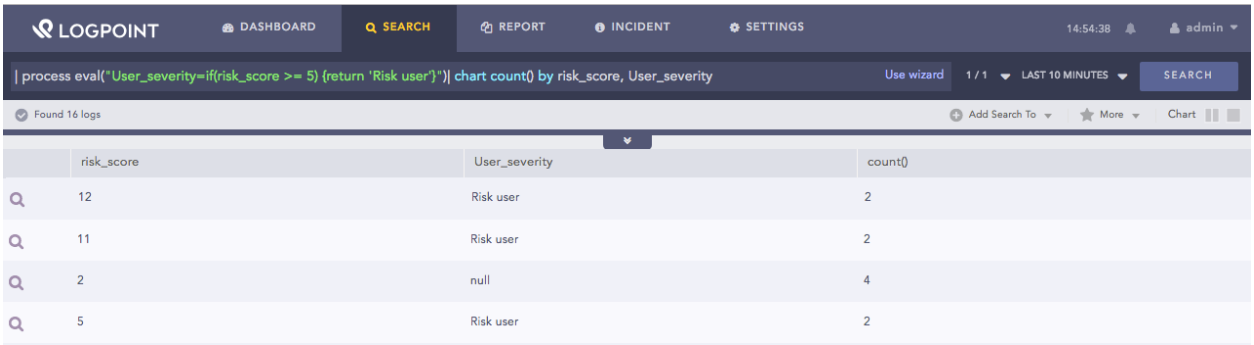


Fig. 1: If statement function

5.2 If-else Statement

This function accepts a condition and two strings *X* and *Y*. It compares the given *condition*; if the *condition* is true, it returns *X*, else returns *Y*.

Syntax:

```
| process eval("identifier=if(condition) {return X} else {return Y}")
```

Example:

```
| process eval("is_profitloss=if((Selling_price%cost_price) == 0)
 {return 'No profit/loss'} else {return 'profit/loss'}")
| fields Selling_price, cost_price, is_profitloss
```

The above example checks if the remainder value when *Selling_price* field is divided by *cost_price* field is 0. It returns *No profit/lost* in the *is_profitloss* identifier if the condition is true, else returns *profit/loss*.

The *fields* command displays the value of *Selling_price*, *cost_price*, and *is_profitorloss* in a tabular form.

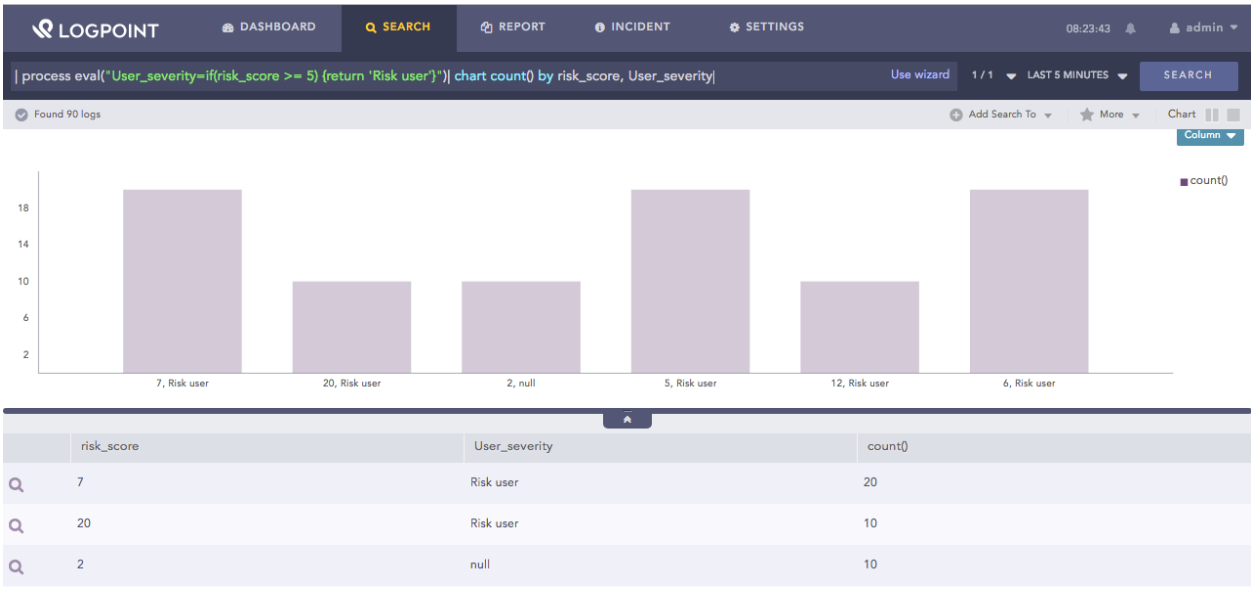


Fig. 2: If-else statement function

5.3 If-elseif-else Statement

This function accepts one or more alternating conditions and values. It compares the *condition* with the following order.

- if the first *condition* is true, it returns the value provided in *X*,
- else compares the second *condition*; if the second *condition* is true, it returns the value provided in *Y*,
- else returns the value provided in *Z*.

Syntax:

```
| process eval("identifier=if(condition){return X} else-if(condition) {return Y} else { return Z}")
```

Example:

```
| process eval("User_severity=if(risk_score > 5) {return 'Risk user'}
 else-if(risk_score<=0) {return 'No risk'} else {return 'Normal user'}")
| fields risk_score, User_severity
```

The above example checks if the value of the *risk_score* field is greater than 5. It returns *Risk user* in the *User_severity* identifier if the condition is true, else it compares the second condition, i.e., it checks if the value of the *risk_score* field is less than or equal to 0 and returns *No risk* if true. If both of these conditions is false, it returns *Normal user*.

The *fields* command displays the value of *risk_score* and *User_severity* in a tabular form.

Fig. 3: If-elseif-else statement function

5.4 Case Statement

This function accepts one or more alternating conditions and values. It compares the *condition* with the following order.

- if *case_one* matches the value of the *data*, it returns the value provided in *X*,
- else checks if the *case_two* matches the value of the *data*; if the condition is true, it returns the value in *Y*,
- else returns the value in *Z* by default.

Syntax:

```
| process eval("identifier=switch(data) {case(case_one) {return X}
 case(case_two) {return Y} default {return Z}}")
```

Example:

```
| process eval("Access_type=switch(action) {case('allow') {return 'Allow access'}
 case('deny') {return 'Deny access'} default {return 'Forward access'}}")
| fields action, Access_type
```

The above example returns *Allow access* in the *Access_type* identifier if the the value of the *action* field is *access*; Else if the value of *action* is *deny*; it returns *Deny access*, else it returns *Forward access* by default.

The *fields* command displays the value of *action* and *Access_type* in a tabular form.

Fig. 4: Case statement function

5.5 cidrmatch

This function accepts two arguments, a *CIDR* (Classless Inter-Domain Routing) notation, and an *IP* address. It returns *True* if the *IP* address matches the *CIDR* notation, else returns *False*.

Syntax:

```
| process eval("identifier=cidrmatch(CIDR, IP)")
```

Example:

```
| process eval("is_local_ip=cidrmatch('127.0.0.0/8', device_ip)")
```

The above example returns *true* in the *is_local_ip* identifier if the value of the field *device_ip* matches the CIDR notation 127.0.0.0/8, else returns *false*.

Fig. 5: Cidrmatch function

5.6 coalesce

This function accepts an arbitrary number of arguments as inputs and returns the value of the first argument that is not null.

Syntax:

```
| process eval("identifier=coalesce(X,Y,...)")
```

Example:

```
| process eval("ip_add=coalesce(ip_address,device_ip)")
| fields ip_address, device_ip, ip_add
```

The above example returns the value of the *ip_address* field in the *ip_add* identifier if the its value is not null. If null, it checks the value of the *device_ip* field. If the *device_ip* field is not null, it returns its value in the *ip_add* identifier .

The *fields* command displays the value of *ip_address*, *device_ip*, and *ip_add* in a tabular form.

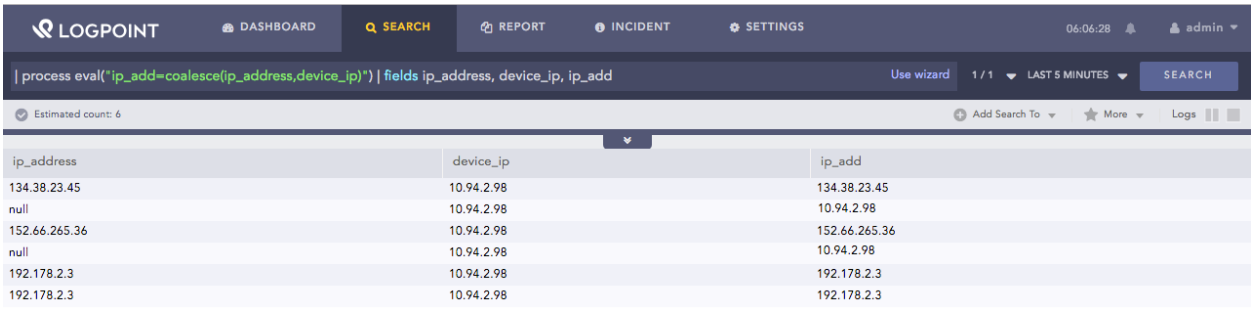


Fig. 6: Coalesce function

5.7 false

This function returns *False*. The *false* function in combination with other functions represents a condition that is undoubtedly false, i.e., 1==0. Unlike other functions, this function does not take any argument.

Syntax:

```
process eval("identifier=false()")
```

Example:

```
process eval("is_profit=if(Selling_price > cost_price) {return true()} else {return false()}")
chart count() by Selling_price, cost_price, is_profit
```

The above example checks the value in the *Selling_price* and *cost_price* fields. It returns *true* in the *is_profit* identifier if the *Selling_price* is greater than the *cost_price*, else returns *false*.

The *chart count()* command displays the *count* of the combination *Selling_price* and *cost_price* values as a chart and in a tabular form.

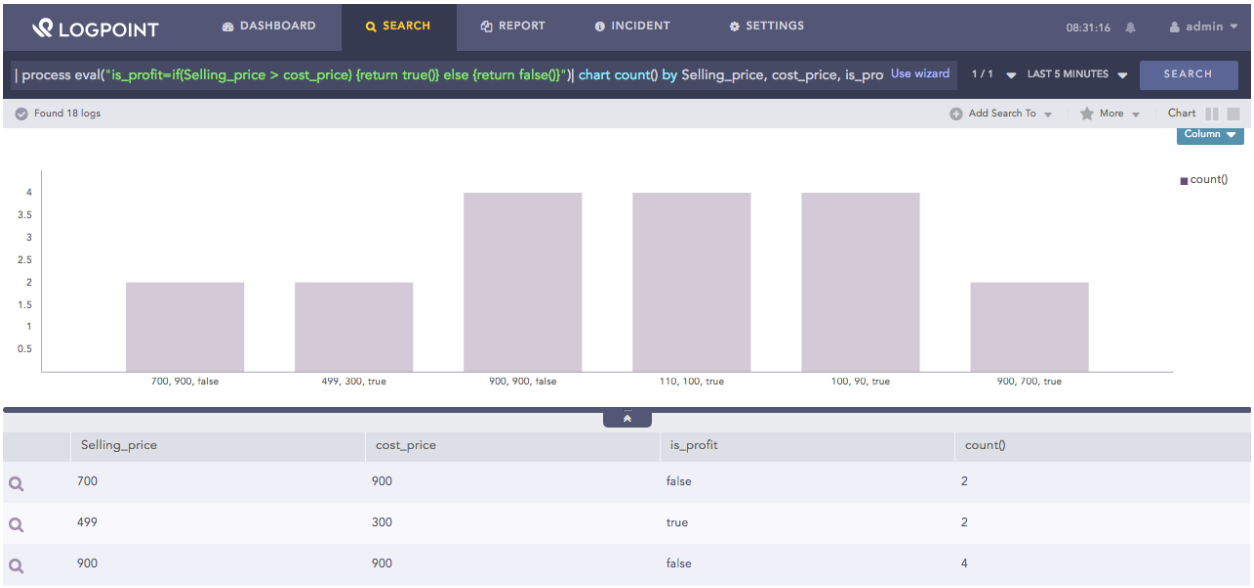


Fig. 7: False function

5.8 in

This function accepts a *field* of an event and a list of string values. It returns *True* if one of the values in the list matches the value specified in the *field*, else returns *False*.

Syntax:

```
process eval("identifier=in(field, value1, value2, value3, ...)")
```

Example:

```
process eval("isUserAdmin=in(user, 'Administrator', 'administrator', 'Admin', 'admin')")
chart count() by user, isUserAdmin
```

The above example returns *true* in the *isUserAdmin* identifier if the value in the *user* field matches with any one value in the list, i.e., *Administrator*, *administrator*, *Admin*, and *admin*, else returns *false*.

The *chart count()* command displays the *count* of the combination of *user* and *isUserAdmin* values as a chart and in a tabular form.

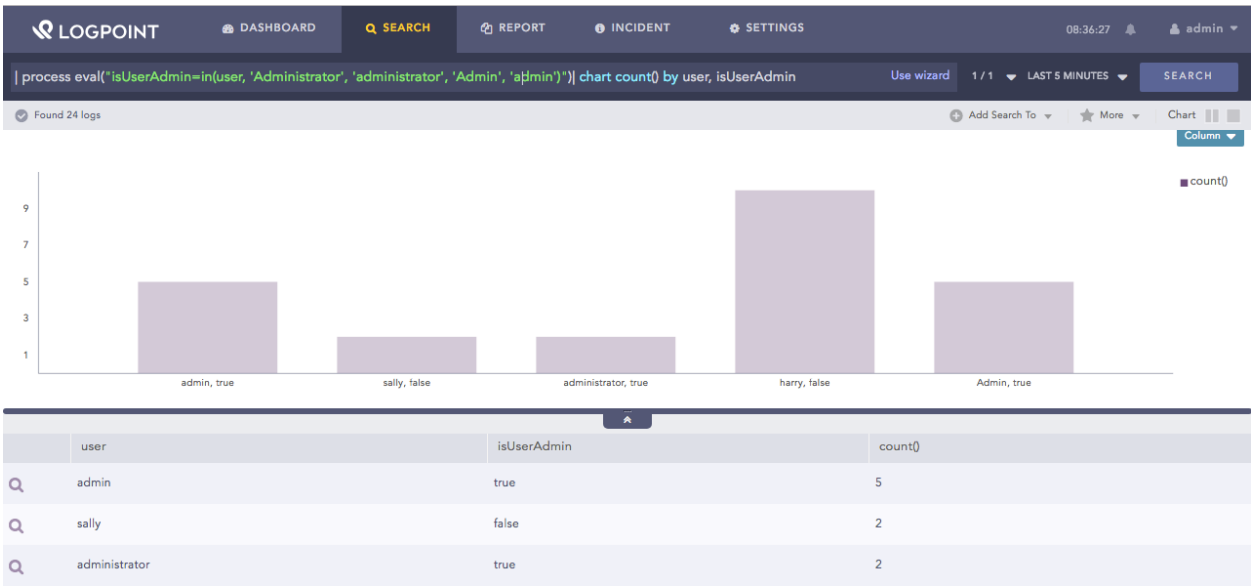


Fig. 8: In function

5.9 match

This function accepts a text field *X* and a *regex* (regular expression) string. It returns *True* or *False* based on whether the given regular expression finds a match against any substring of the text in the field *X*.

This function also returns *True* if the text in *regex* string exactly matches the text in the field *X*.

Syntax:

```
process eval("identifier=match(X, regex)")
```

Example:

```
| process eval("is_coltype_filesystem=match(col_type,'file.*')") | chart count() by col_type, is_
↪coltype_filesystem
```

The above example compares the regex string 'file.*' with the value in the *col_type* field. It returns *true* in the *is_coltype_filesystem* identifier if the pattern is an exact match or is a substring of the value of *col_type* field, else returns *false*.

The *chart count()* command displays the *count* of the combination of *col_type* and *is_coltype_filesystem* values as a chart and in a tabular form.

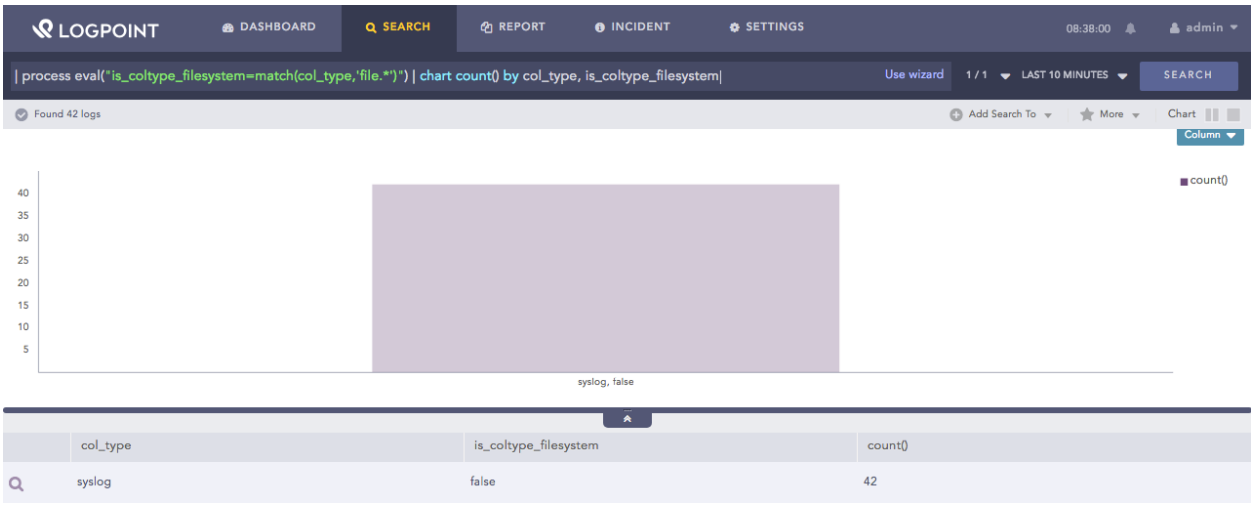


Fig. 9: Match function

5.10 like

This function accepts a text field *X* and a *pattern*. It returns *True* if the text in the field *X* matches the given *pattern*, else returns *False*. This function also returns *True* if the text in the pattern exactly matches the text in the field X.

The *pattern* supports a regular expression as well as the percent character (%) for wildcards and an underscore character (_) for a single character match.

Syntax:

```
| process eval("identifier=like(X, pattern)")
```

Example:

```
| process eval("is_coltype_syslog=like(col_type,'sys%')")
| chart count() by col_type, is_coltype_syslog
```

The above example compares the *sys%* pattern with the value in the *col_type* field. It returns *true* in the *is_coltype_filesystem* identifier if the *sys%* pattern is an exact match

or is a substring of the value of *col_type* field, else returns *false*.

The *chart count()* command displays the *count* of the combination of *col_type* and *is_coltype_syslog* values as a chart and in a tabular form.

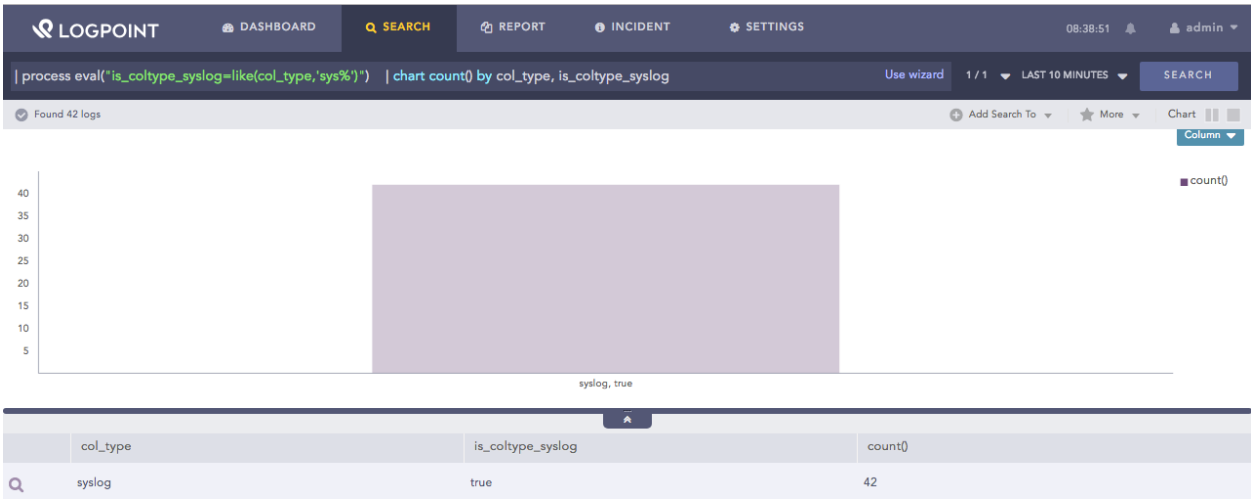


Fig. 10: Like function

5.11 null

This function returns null. You use the null function in combination with other functions. You use this function in case you do not want any value returned in the user interface. Unlike other functions, this function does not take any argument.

Syntax:

```
| process eval("identifier=null()")
```

Example:

```
| process eval("User_severity=if(score <= 5) {return null() } else {return 'Risk user'}")
| chart count() by score, User_severity
```

The above example returns *null* in the *User_severity* identifier if the value of the *score* field is less or equal to 5, else returns *Risk user*.

The *chart count()* command displays the *count* of the combination of *score* and *User_severity* values as a chart and in a tabular form.

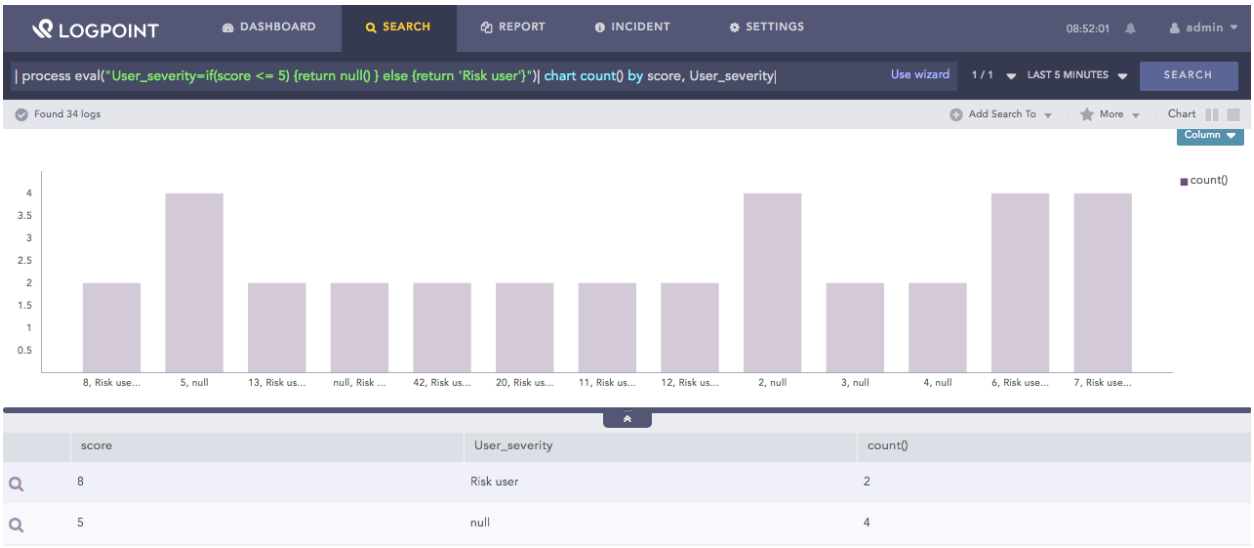


Fig. 11: Null function

5.12 nullif

This function compares two arguments, *X* and *Y*. If *X* = *Y*, it returns null, else returns the value of *X*.

Syntax:

```
| process eval("identifier=nullif(X, Y)")
```

Example:

```
| process eval("access_type=nullif(access,'DELETE')")
| chart count() by access, access_type
```

The above example returns *null* in the *access_type* identifier if the value of the *access* field is DELETE, else returns the value of the *access*.

The *chart count()* command displays the *count* of the combination of *access* and *access_type* values as a chart and in a tabular form.

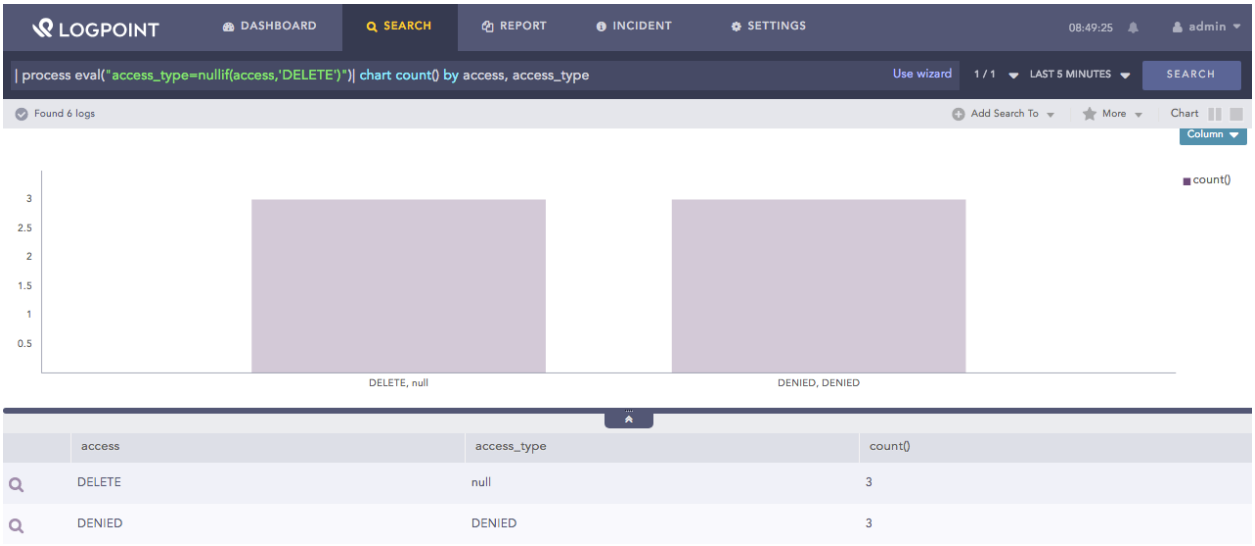


Fig. 12: Nullif function

5.13 searchmatch

This function accepts a string field *X* as input. It returns *True* if the value of *X* matches the event type, else returns *False*. You can use the pipe (|) symbol to separate multiple values of *X*.

Syntax:

```
| process eval("identifier=searchmatch(X)")
```

Example:

```
| process eval("is_authenticaion_event=searchmatch('Authentication | Access')")
```

The above example returns *null* in the *is_authentication_event* identifier if the value of the *access* field is DELETE, else returns *false*.

Fig. 13: Searchmatch function

5.14 true

This function returns *True*. It is often used in combination with other functions to represent a condition that is undoubtedly true, i.e., 1==1. Unlike other functions, this function does not take any argument.

Syntax:

```
process eval("identifier=true()")
```

Example:

```
process eval("is_profit=if(Selling_price > cost_price) {return true()} else {return false()}")
chart count() by Selling_price, cost_price, is_profit
```

The above example returns *true* in the *is_profit* identifier if the value of the *Selling_price* field is greater than the value of the *cost_price* field, else returns *false*.

The *chart count()* command displays the *count* of the combination of *Selling_price*, *cost_price*, and *is_profit* values as a chart and in a tabular form.

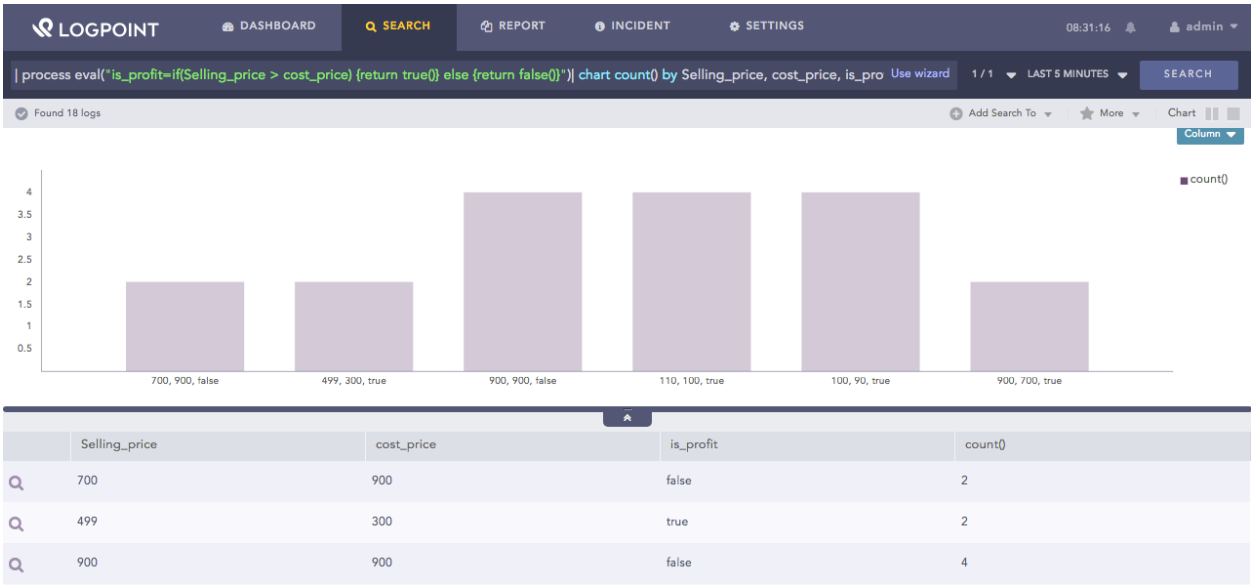


Fig. 14: True function

5.15 contains

This function accepts three arguments *X*, *Y*, and *Z* and returns *True* if the value of *X* is within *Y* separated by a delimiter *Z*. If *X* is not listed, the function returns *False*. In the absence of a delimiter, the comma is a default delimiter.

Syntax:

```
| process eval("identifier=contains(X, Y, Z)")
```

Example:

```
| process eval("exists=contains('log','/var/log/syslog', '/') ")
```

The above example returns *true* in the *exists* identifier if the *log* string is within */var/log/syslog* string separated by */* delimiter. If the *log* string is not listed, the function returns *False*.

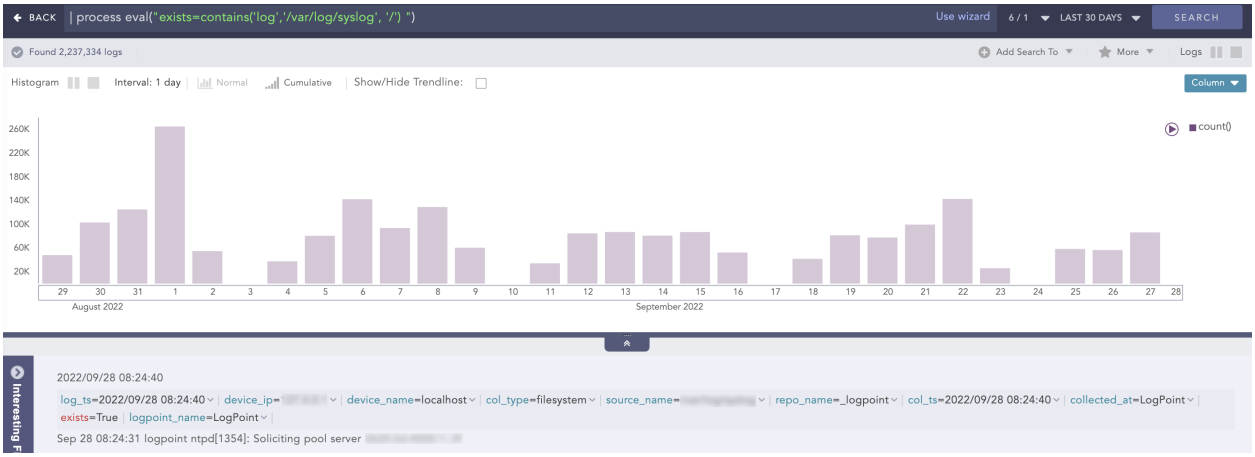


Fig. 15: Contains function

CHAPTER

SIX

MULTIVALUE FUNCTIONS

The **Multivalue functions** evaluate multivalue arguments and return multivalue fields.

6.1 split

This function accepts two arguments, *X* and *Y* as inputs. It splits the values of the field *X* by the delimiter (such as comma, semicolon, blank space) specified in the field *Y* and returns a multivalue field containing a list of split values.

Syntax:

```
| process eval("identifier=split(X,Y)")
```

Example:

```
| process eval("split_message=split(message, ' ')")
| fields message, split_message
```

The above example splits the value of the *message* field when the *split* function encounters a space in the value and returns split values in the *split_message* identifier.

The *fields* command displays the value of *fields* and *split_message* in a tabular form.

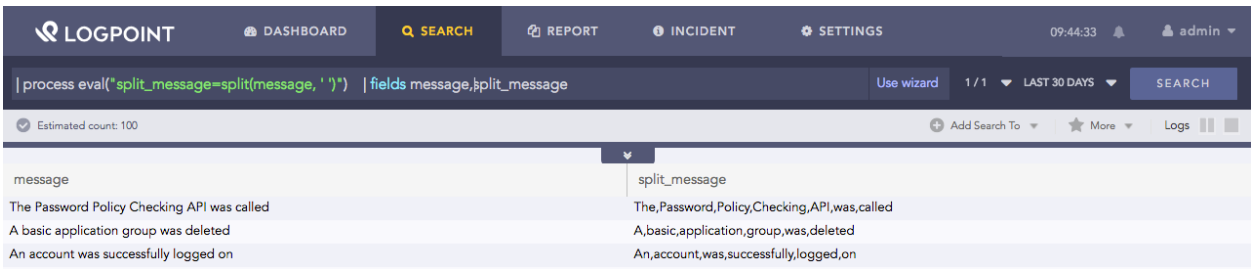


Fig. 1: Split function

6.2 commands

This function accepts a search string *X* as input, or a field that contains a search string, and returns a multivalue field containing a list of the commands used in *X*.

Syntax:

```
| process eval("identifier=commands(X)")
```

Example:

```
| process eval("commands_list=commands('chart count() | fields name | rename message as alert
↪')")
| fields commands_list
```

The above example returns the list of the commands present in the provided search string, i.e., *chart count() | fields name | rename message as alert*, and returns them in the identifier *commands_list*.

The *fields* command displays the value of *commans_list* in a tabular form.

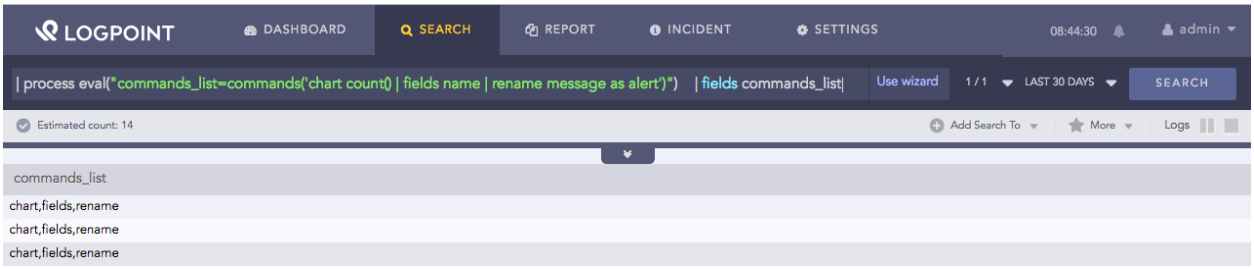


Fig. 2: Commands function

6.3 mvappend

This function accepts two or more arguments as inputs and appends the values of the arguments. It returns a multivalue result containing a list of all the appended values. The arguments can be strings, multivalue fields or single value fields.

Syntax:

```
| process eval("identifier=mvappend(X, ...)")
```

Example:

```
| process eval("ip_address=mvappend(source_address, destination_address)")
| fields source_address, destination_address, ip_address
```

The above example returns the appended value of the *source_addess* and *destination_address* fields in the *ip_address* identifier.

The *fields* command displays the value of *source_address*, *destination_address*, and *ip_address* in a tabular form.

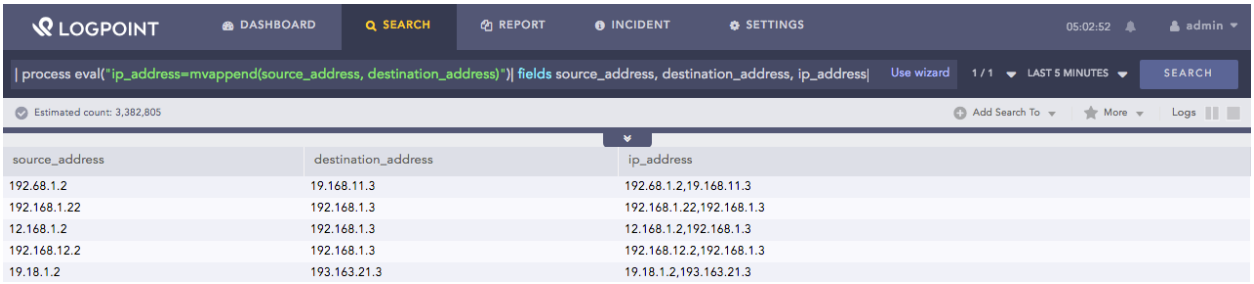


Fig. 3: Mvappend function

6.4 mvcount

This function accepts either a multivalue field or a single value field *X* as input and returns the count of the values of that field.

Syntax:

```
| process eval("identifier=mvcount(X)")
```

Example:

```
| process eval("message_character_count=mvcount(split(message, ' '))")
| fields message, message_character_count
```

The above example compares the values obtained from *split(message, ' ')* to the pattern acco.. acco. means any sequence of letters that can follow the string acco. If the values obtained from split(message, ' ') and pattern match, it returns the matched value in the filter_account_message identifier. If they don't match it returns 0.

The *fields* command displays the value of *message* and *message_character_count* in a tabular form.

Fig. 4: Mvcount function

6.5 mvdedup

This function removes duplicate values of a multivalue field *X* and returns a multivalue output in a list.

Syntax:

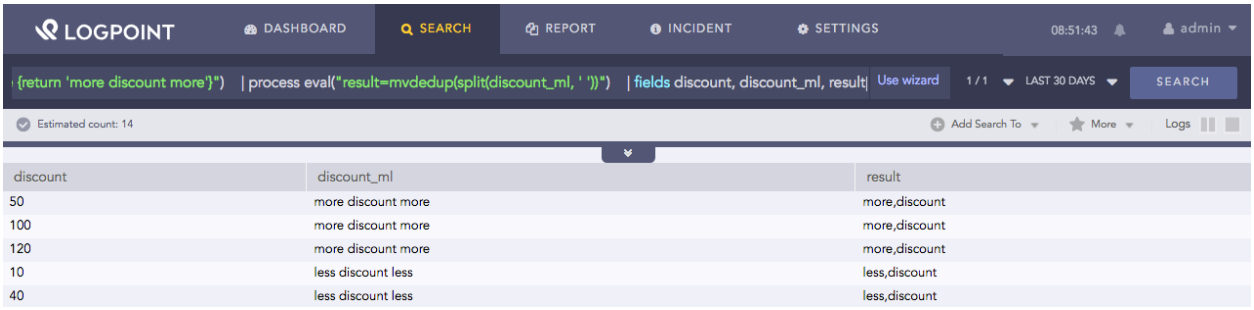
```
| process eval("identifier=mvdedup(X)")
```

Example:

```
| process eval("discount_ml=if(discount < 50) {return 'less discount less'}
 else {return 'more discount more'}")
| process eval("result=mvdedup(split(discount_ml, ' '))")
| fields discount, discount_ml, result
```

The above example first returns *less discount less* in the *discount_ml* identifier if discount is less than 50, else returns *more discount more*. The *split* function splits the value of *discount_ml* when it encounters a space. Then, the *mvdeup* function removes the duplicate values in the value obtained from the *split(discount_ml, ' ')* and returns it in the *result* identifier.

The *fields* command displays the value of *discount*, *discount_ml*, and *result* in a tabular form.



discount	discount_ml	result
50	more discount more	more,discount
100	more discount more	more,discount
120	more discount more	more,discount
10	less discount less	less,discount
40	less discount less	less,discount

Fig. 5: Mvdedup function

6.6 mvfilter

This function accepts a multivalue field *X* and a *pattern* as inputs. It filters the values of the field using the *pattern*, and returns a multivalue or a single value field containing the list of values that match the given *pattern*.

Syntax:

```
| process eval("identifier=mvfilter(X, pattern)")
```

Example:

```
process eval("filter_account_message=mvfilter(split(message, ' '), 'acco.*')")
fields message, filter_account_message
```

The above example compares the values obtained from *split(message, ' ')* to the pattern *acco.**. *acco.** mean any sequence of letters can follow the string *acco*. If the values obtained from *split(message, ' ')* and pattern matches, it returns the matched value in the *filter_account_message* identifier, else returns 0. Refer to the *split* section to know on the value from *split(message, ' ')*.

The *fields* command displays the value of *fields message* and *filter_account_message* in a tabular form.

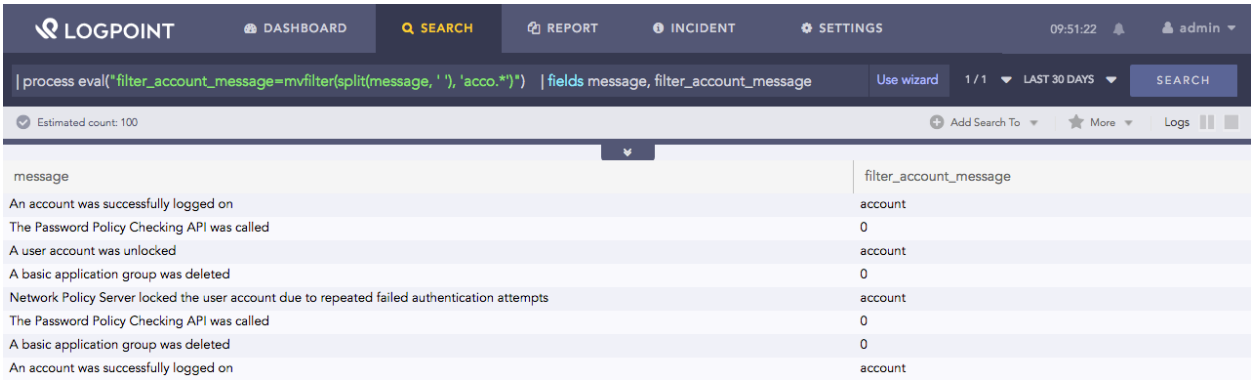


Fig. 6: Mvfilter function

6.7 mvfind

This function accepts two arguments, a multivalue field *X*, and a regex (regular expression) pattern *Y*. It tries to match the regular expression against any substring of the value in X. If there is a match, the function returns the index (beginning from zero) of the first value that matches the regex pattern. If there isn't a match, it returns null.

Syntax:

```
process eval("identifier=mvfind(X, Y)")
```

Example:

```
process eval("indexof_account=mvfind(split(message, ' '), 'acco.*')")
fields message, indexof_account
```

The above example search for the first match in the values obtained from *split(message, ' ')* to the pattern *acco.**. *acco.** mean any sequence of letters can follow the string *acco*.

If the function finds a match in the values obtained from *split(message, ' ')* to the pattern *acco.**, it returns the index (position) of the first match (index starts from zero) in the *indexof_account* identifier.

The *fields* command displays the value of *fields message* and *indexof_account* in a tabular form.

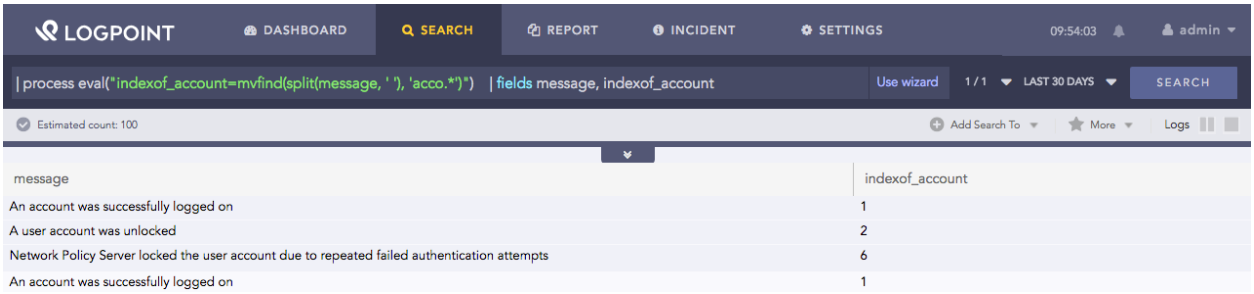


Fig. 7: Mvfind function

6.8 mvindex

This function accepts up to three arguments, a multivalue field *X*, a number *start_index* and a number *end_index*. It evaluates the values of the string X and returns the value that starts at the index specified by *start_index* and ends at the index specified by *end_index*.

- The field *X* and the *start_index* are required. The *end_index* is inclusive and optional while providing positive values for both the start and end index.
- If the *end_index* is not specified, the function returns only the value at *start_index*.
- The *start_index* and *end_index* can be negative. Both the *start_index* and *end_index* is required while providing negative values for either the *start_index* or *end_index*.
- If the indices are out of range or invalid, the result is null.

Syntax:

```
| process eval("identifier=mvindex(X, start_index, end_index)")
```

Example:

```
| process eval("index_message=mvindex(split(message, ' '), 2)")
| fields message, index_message
```

The above example returns the third value (index starts from 0) in the values obtained from *split(message, ' ')* in the *index_message* identifier.

The *fields* command displays the value of *fields message* and *index_message* in a tabular form.

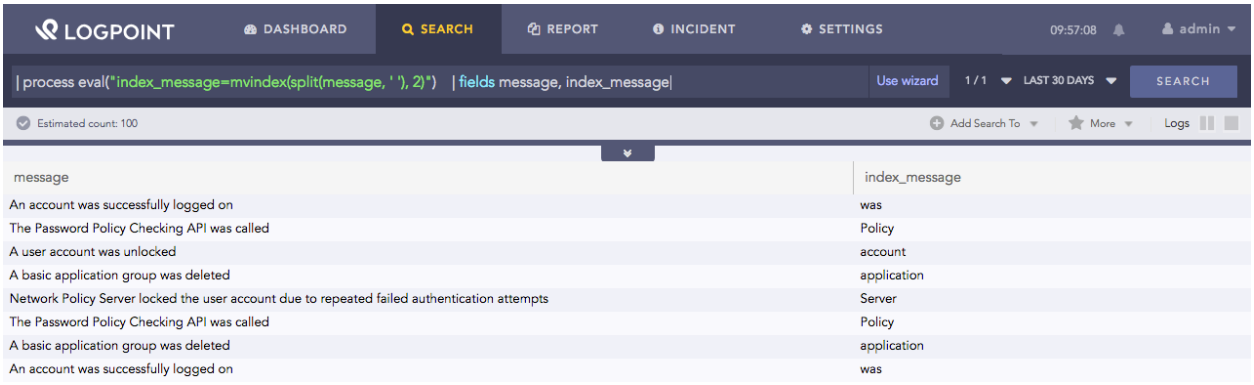


Fig. 8: Mvindex function

6.9 mvjoin

This function accepts two arguments, a multivalue field *X*, and a string delimiter (such as comma, semicolon, blank space) *Y*. The function concatenates the individual values within *X* using the value of *Y* as a separator.

Syntax:

```
| process eval("identifier=mvjoin(X, Y)")
```

Example:

```
| process eval("result=mvjoin(split(message, ' '), ',')")
| fields message, result
```

The above example accepts the values from *split(message, ' ')* and joins the received values with a comma. It returns the joined values in the *result* identifier. Refer to the *split* section to know on the value from *split(message, ' ')*.

The *fields* command displays the value of the *message*, and *result* in a tabular form.

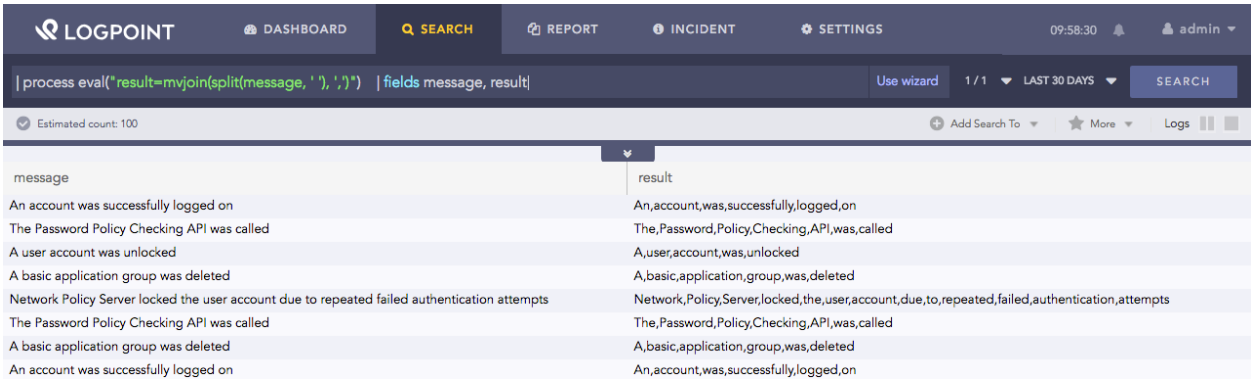


Fig. 9: Mvjoin function

6.10 mvrange

It takes up to three arguments: a starting number *X*, an ending number *Y*, and an optional step increment *Z*. It returns the range of *X* and *Y*, where *Y* is excluded from the result.

- If *Z* is not provided, the default increment step is +1.
- If *Z* is a timespan like 1d (1 day), then *X* and *Y* are treated as UNIX time.

Syntax:

```
| process eval("identifier=mvrange(X, Y, Z)")
```

Example 1:

```
| process eval("range=mvrange(1,5)")
```

The above example returns the value from 1 to 5 (excluding 5) with +1 increment in the *range* identifier. The result is 1, 2, 3, 4.

Fig. 10: Mvrange function

Example 2:

```
process eval("range=mvrange(1.1,5)")
```

The above example returns the value from 1.1 to 5 with +1 increment in the *mvrange* identifier. The result is 1.1, 2.1, 3.1, 4.1.

Example 3:

```
process eval("range=mvrange(1.5,6,1.5)")
```

The above example returns the value from 1.5 to 6 (excluding 6) with +1.5 increment in the *mvrange* identifier. The result is 1.5, 3, 4.5.

Example 4:

```
process eval("range=mvrange(1134,343434,'1d')")
```

The above example returns the value from 1134 to 343434 with +86400 increment in the *mvrange* identifier. The result is 1134, 87534, 173934, 260334.

Here, 1d = 86400 seconds

Example 5:

```
process eval("range=mvrange(1233.124224,2434455.1232323,'1w')")
```

The above example returns the value from 1233.124224 to 2434455.1232323 with +604800 increment in the *mvrange* identifier. The result is 1233.124224, 606033.124224, 1210833.1242240001, 1815633.1242240001, 2420433.124224.

Here, 1w = 604800 seconds

6.11 mvsort

This function accepts a multivalue field *X* and returns a multivalue field containing the list of values of the field *X* sorted in lexicographical order (alphabetically).

- In lexicographical order, numbers are sorted by digits. So numbers are sorted before letters. If the first digits match, the second digits get compared. The comparison is like a string. For example, 10 comes before 2, but 111 comes after 10 (and also after 1000) because 0 is less than 1. A lexical sort compares the characters in each string as characters, not integral values.
- All the uppercase letters are sorted before the lowercase letters.

Syntax:

```
| process eval("identifier=mvsort(X)")
```

Example 1:

```
| process eval("sort=mvsort(split(message, ' '))") | fields message, sort
```

The above example accepts the values from *split(message, ' ')* and sorts them according to the rule described above. It returns the sorted value in the *sort=mvsort* identifier.

The *fields* command displays the value of the *message* and *sort* in a tabular form.

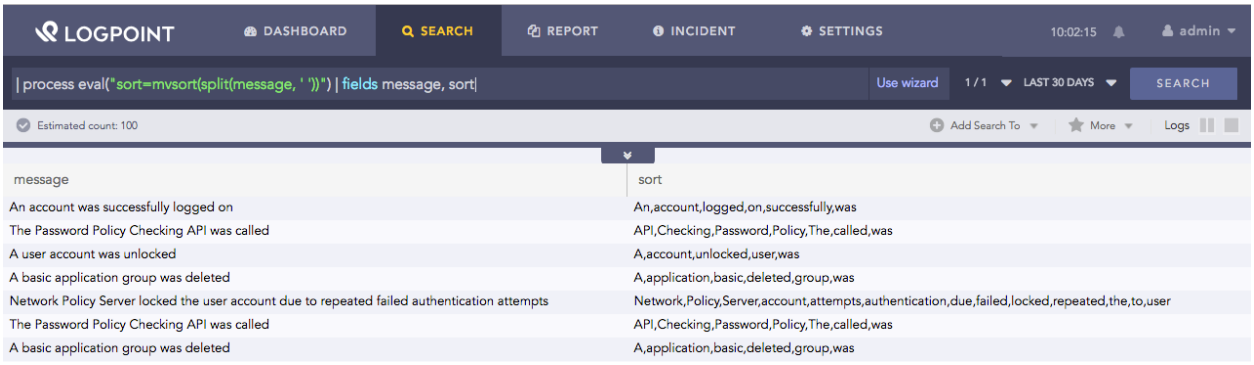


Fig. 11: Mvsort function

Example 2:

If testData = {“test1”, 1, 1.2}

```
| process eval("sort=mvsort(testData)")
```

The above example sorts the data in the *testData* field according to the rule described above and returns the sorted value in the identifier sort. The result is [1, 1.2, “test1”]

6.12 mvzip

This function accepts up to three arguments. It takes two multivalue fields, *X* and *Y* and combines the values of these fields. It joins the first value of the *X* field with the first value of the *Y* field and the second value of *X* with the second value of *Y*. The third field *Z* specifies a delimiting character that joins the two values of the fields *X* and *Y*. The *Z* field is optional, and the default delimiter is a comma.

Syntax:

```
| process eval("identifier=mvzip(X,Y,Z)")
```

Example 1:

If users = [“john”, “jack”, “kim”], machines = [“lp1”, “lp2”, “lp3”]

```
| process eval("x=mvzip(users,machines)")
```

The above example accepts the values from *users* and *machines* fields. It joins the first value of the *user* field with the first value of the *machines* field and and the second value of the *users* field with the second value of the *machines* field and continues in the same way. A comma separates the values in the joined fields. It returns the joined value in the *x* identifier. Result: [“john,lp1”, “jack,lp2”, “kim,lp3”]

Example 2:

```
| process eval ("category_split= split(event_category, ' ')")
| process eval ("event_split= split(event_type, ' ')")
| process eval ("zip= mvzip(category_split,event_split, ' ')")
| fields event_category, event_type ,category_split, event_split, zip
```

The above example searches for the first match in the values obtained from split(message, ‘ ‘) to the pattern acco. acco. means any sequence of letters that can follow the string acco. If the function finds a match in the values obtained from split(message, ‘ ‘) to the pattern acco.*, it returns the index (position) of the first match (index starts from zero) in the indexof_account identifier. For more information on the value from split(event_category, ‘ ‘) and split(event_type, ‘ ‘), go to the split section.

The *fields* command displays the value of *event_category*, *event_type*, *category_split*, and *zip* in a tabular form.

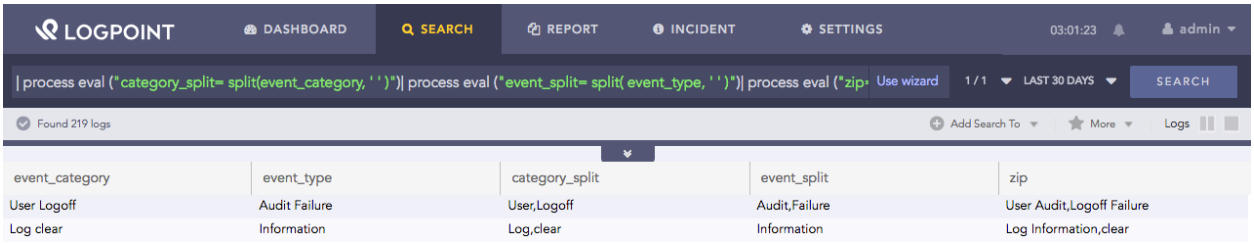


Fig. 12: Mvzip function

CHAPTER

SEVEN

STATISTICAL FUNCTIONS

The **Statistical functions** evaluate the maximum and minimum value of numeric or string argument.

7.1 max

This function accepts an arbitrary number of arguments as inputs and returns the maximum of any numeric or string argument. The values of arguments get converted into ASCII (American Standard Code for Information Interchange), so a string is greater than a number.

Syntax:

```
process eval("identifier=max(X, ...)")
```

Example:

```
process eval("Maximum_datasize=max(received_datasize,sent_datasize)")
fields received_datasize, sent_datasize, Maximum_datasize
```

The above example returns the highest value of the *received_datasize* and *sent_datsize* fields in the *Maximum_datasize* identifier.

The *fields* command displays the value of *received_datasize*, *sent_datasize*, and *Maximun_datasize* in a tabular form.

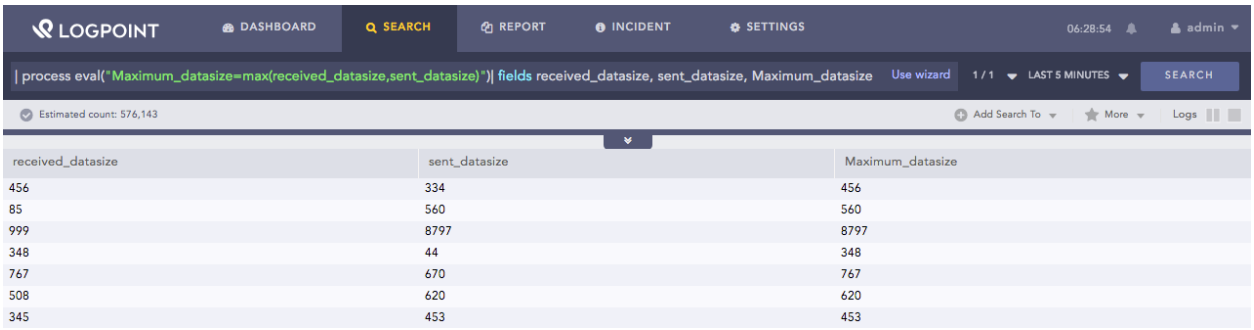


Fig. 1: Max function

7.2 min

This function accepts an arbitrary number of arguments as inputs and returns the minimum of any numeric or string argument. The values of arguments get converted into ASCII (American Standard Code for Information Interchange), so a string is greater than a number.

Syntax:

```
| process eval("identifier=min(X, ...)")
```

Example:

```
| process eval("Minimum_datasize=min(received_datasize,sent_datasize)")
| fields received_datasize, sent_datasize, Minimum_datasize
```

The above example returns the lowest value of the *received_datasize* and *sent_datsize* fields in the *Minimum_datasize* identifier.

The *fields* command displays the value of *received_datasize*, *sent_datasize*, and *Minimum_datasize* in a tabular form.

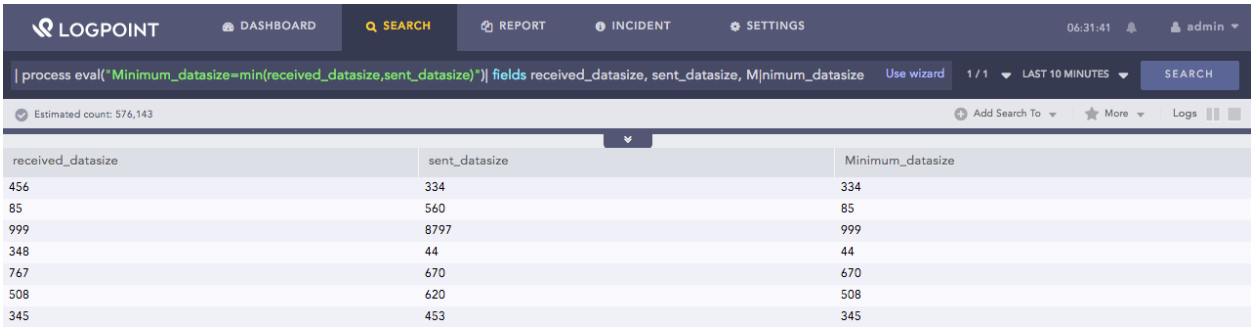


Fig. 2: Min function

CHAPTER

EIGHT

CONVERSION FUNCTIONS

The **Conversion functions** convert numbers and strings to different formats.

8.1 printf

This function accepts a string *format* and *arguments* as inputs and returns a formatted string value based on these inputs.

Syntax:

```
| process eval("identifier=printf(format, arguments)")
```

- format: The **format** is a character string that comprises one or more format conversion specifiers. The format must always be within single quotes (' ').
- arguments: The **arguments** can include one or more string, number, or field name.

Example:

```
| process eval("result=printf('Hello %s. Your user score is %d.',user,score)")
| fields user, score, result
```

The above example assigns the value of the *user* field to *%s* and *score* field to *%d* and returns the defined sequence of strings in the *result* identifier.

The *fields* command displays the value of the *user*, *score*, and *result* in a tabular form.

Fig. 1: Printf function

8.2 tonumber

This function accepts a string value *X*, and a *BASE* as inputs. It converts the string *X* to a number by the specified *BASE*.

Syntax:

```
| process eval("identifier=tonumber(X, BASE)")
```

- *X* can be a field name or a string value.
- The *BASE* defines the base number to convert the string value *X*. *BASE* can range from 2 to 36.

Example:

```
| process eval("result=tonumber('0A5',12)")
```

The above example converts the string value *0A5* to a number by taking base 12 and returns it in the *result* identifier.

Fig. 2: Tonumber function

8.3 tostring

This function accepts at least one argument *X* as input and converts the input value *X* to a string. If *X* is a number, the second field *Y* can be "hex," "commas," or "duration." *Y* is optional.

Syntax:

```
| process eval("identifier=tostring(X, Y)")
```

- If X is a number, the function converts the number to a string,
- If X is a Boolean value, it returns the corresponding string value, True or False.

Syntax	Description
tostring(X, "hex")	Converts the input value X to hexadecimal.
tostring(X, "commas")	Formats the input value X with commas. If the number includes decimals, it is rounded to the nearest two decimal places.
tostring(X, "duration")	Converts the input value X (in seconds) to the readable time format HH:MM:SS.

Example 1:

```
| process eval("x=tostring(12)")
```

The above example converts the numeric value of *12* to string.

Example 2:

```
| process eval("result=tostring(score,'hex')")
```

The above example converts the numeric value of the *score* field to its corresponding hexadecimal string value and assigns it in the *result* identifier.

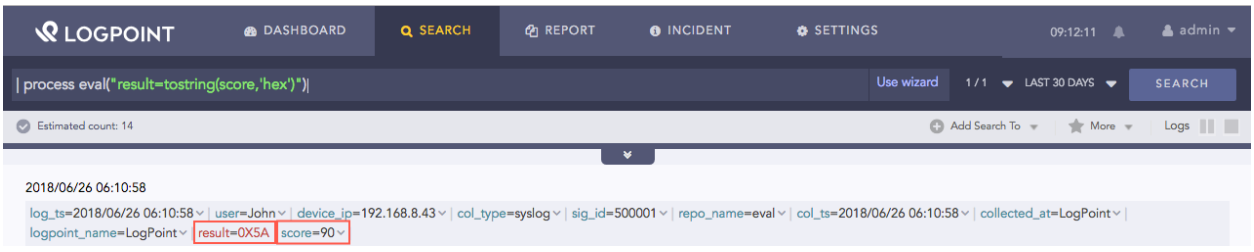


Fig. 3: Tostring function

Example 3:

```
process eval("x=tostring(65,'duration')")
```

The above example converts the numeric value 65 into the readable time format HH:MM: and returns it in the *x* identifier. The result is *00:01:05.000*.

Example 4:

```
process eval("x=tostring(65132.6789,'commas')")
```

The above example formats the numeric value *65132.6789* with a comma and rounds the decimal value to the two decimal place (hundredths position) and returns it in the *x* identifier. The result is *65,132.68*.

CHAPTER

NINE

EXPRESSION WITH PARENTHESES

Parentheses clarify the order of expressions, for example the eval command first evaluates the parts of expression contained within the parentheses.

Example:

```
| process eval("Profit_percent=(Selling_price-cost_price)/cost_price * 100")
| fields Selling_price, cost_price, Profit_percent
```

The above example calculates the specified arithmetic expression and returns its value in the *Profit_percent* identifier. While performing the calculation, the function first evaluates the part of the expression within the parentheses, (Selling_price-cost_price), then it uses this result in the rest of the expression.

The *fields* command displays the value of *Selling_price*, *cost_price*, and *Profit_percent* in a tabular form.

Fig. 1: Expression with parentheses

CHAPTER

TEN

STRING FUNCTIONS

The **String functions** evaluate string values and fields.

10.1 len

This function accepts a string value *X* as input. It evaluates the character length of the string and returns the count of the number of characters in the string.

Syntax:

```
| process eval("identifier=len(X)")
```

Example:

```
| process eval("message_length=len(message)")
| fields message, message_length
```

The above example counts the length of the character in the *message* field and returns the result in the *message_length* identifier.

The *fields* command displays the value of the *message* and *message_length* in a tabular form.

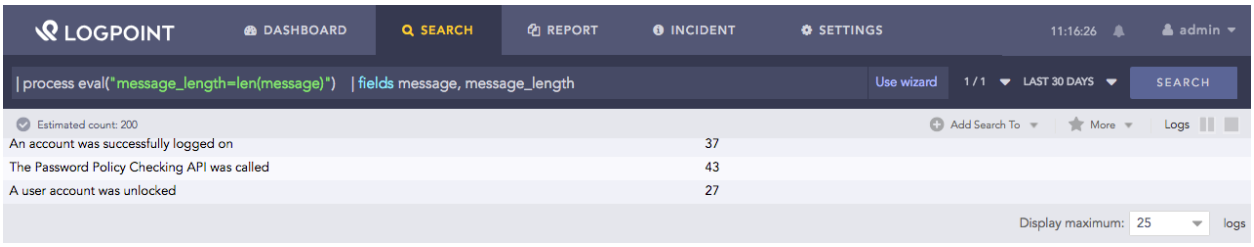


Fig. 1: Len function

10.2 substr

This function accepts up to three arguments, a string value *X*, a start index and an end index. It evaluates the substring of the string *X* and returns the substring that starts at the index specified by *start_index* and ends at the index specified by *end_index*. Here the *end_index* is exclusive.

Syntax:

```
| process eval("identifier=substr(X, start_index, end_index)")
```

Example:

```
| process eval("substring=substr(col_type, 0, 4)")
```

The above example returns the substring of the value of the *col_type* event, starting at index 0 and ending at index 4, in the *substring* identifier.

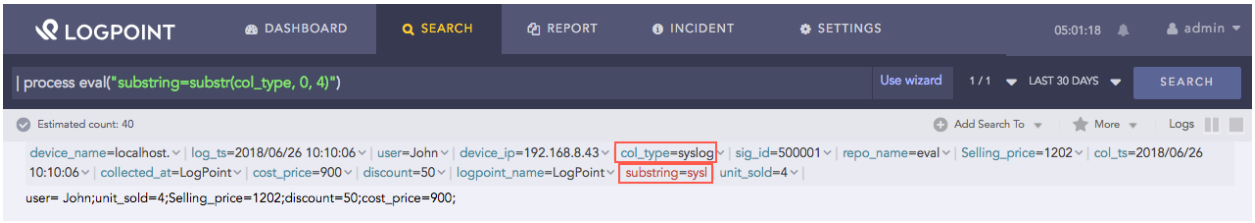


Fig. 2: Substr function

10.3 lower

This function accepts only one string argument *X* as input. It converts the string to lowercase and returns the converted string value.

Syntax:

```
| process eval("identifier=lower(X)")
```

Example:

```
| process eval("username=lower(user)") | fields user, username
```

The above example converts the value of the *user* field to lowercase and returns it in the *username* identifier.

The *fields* command displays the value of *user* and *username* in a tabular form.

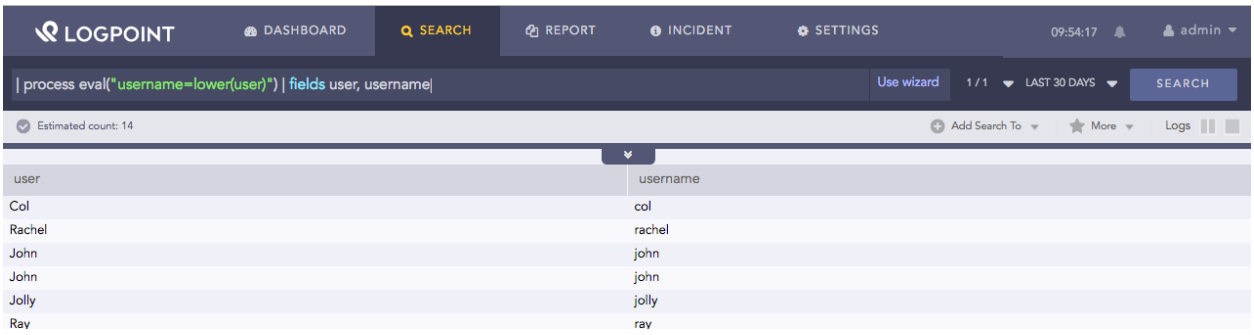


Fig. 3: Lower function

10.4 upper

This function accepts only one string argument *X* as input and converts the string to uppercase and returns the converted string value.

Syntax:

```
| process eval("identifier=upper(string_value)")
```

Example:

```
| process eval("username=upper(user)") | fields user, username
```

The above example converts the value of the *user* field to uppercase and returns it in the *username* identifier.

The *fields* command displays the value of *user* and *username* in a tabular form.

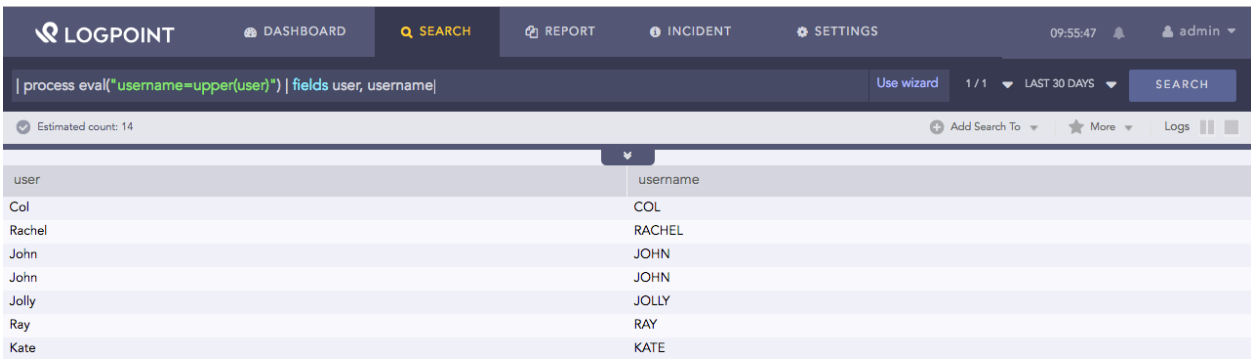


Fig. 4: Upper function

10.5 trim

This function accepts only one string argument *X*. It trims the spaces to the left and right in the string and returns a trimmed value. Trailing spaces are the white spaces located at the end of a line, without any other characters following it, for example blank spaces and tabs.

Syntax:

```
| process eval("identifier=trim(X)")
```

The above example removes the spaces to the left and right from the *Bob* and returns the trimmed value in the *username* identifier.

Example:

```
| process eval("username=trim(' Bob ')")
```

Fig. 5: Trim function

10.6 ltrim

This function accepts up to two string arguments *X* and *Y* as inputs. It trims the string *Y* from the left side of the field *X* and returns a trimmed value. If *Y* is not defined, it trims the spaces from the left side.

Syntax:

```
| process eval("identifier=ltrim(X, Y)")
```

Example:

```
| process eval("result=ltrim(device_name, 'local')")
```

The above example removes the string *local* from the left side in the value of the *device_name* field and returns the trimmed value in the *result* identifier.

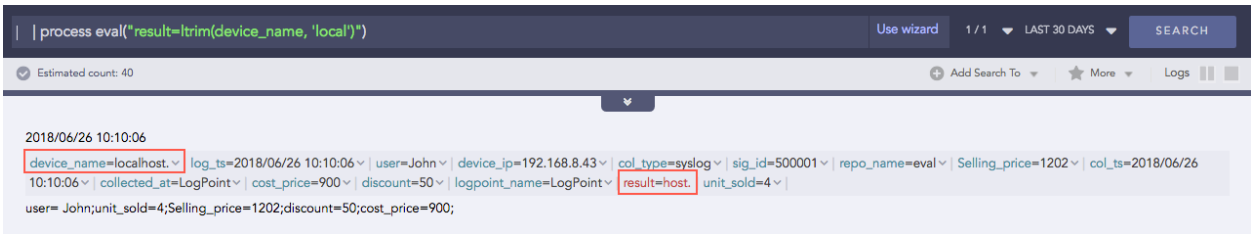


Fig. 6: Ltrim function

10.7 rtrim

This function takes up to two string arguments *X* and *Y* as inputs. It trims the strings *Y* from the right side of the field *X* and returns a trimmed value. If *Y* is not defined, it trims the trailing spaces from the right side.

Syntax:

```
| process eval("identifier=rtrim(X, Y)")
```

Example:

```
| process eval("result=rtrim(device_name, 'host')")
```

The above example removes the string *host* from the right side in the value of the *device_name* field and returns the trimmed value in the *result* identifier.

Fig. 7: Rtrim function

10.8 replace

This function accepts three arguments as inputs: a string *X*, a regex string *Y*, and a string *Z*. It substitutes the string *Z* in the string *X* for every occurrence of the regex string *Y* and returns a string value.

Syntax:

```
| process eval("identifier=replace(X, Y, Z)")
```

Example:

```
| process eval("result=replace('123', '[0-9]', 'X')")
```

The above example substitutes 'X' in the string *123* for the every occurence of the regex string *[0-9]* and returns the replaced value in the *result* identifier.

Fig. 8: Replace function

10.9 spath

This function accepts two arguments, *X* and *Y*, where *X* is the structured data type in XML or JSON format, and *Y* is the XML or JSON formatted location path. It returns a value extracted from the structured data type in *X*, based on the location path in *Y*.

Syntax:

```
| process eval("identifier=spath(X, Y)")
```

Example 1:

```
| process eval("usern=spath('<name>john</name>', 'name')")
```

The above example extracts the value from the location *name* and returns it in the *usern* identifer.

Fig. 9: Spath function

Example 2:

```
| process eval("usern=spath('{name:\john\}', 'name')")
```

The above example extracts the value from the location *name:* and returns it in the *usern* identifer. The result is *usern=john*.

Note: For JSON format data,

- Keys must be without quotes. LogPoint currently does not support nested quotes.
- If the value of any key is a string, replace quote with backslash as shown in *Example 2* above.
- For example, the JSON data is in a key-value pair. Where, keys and values must be within double quotes {"name":"John"}. However, while using the **spath** function, the JSON data is written as {name:\john\}.

10.10 urldecode

This function accepts an escaped URL character *X* and returns the decoded or unescaped URL string.

Syntax:

```
| process eval("identifier=urldecode(X)")
```

Example:

```
| process eval("decoded_url=urldecode('http%3A%2F%2Fwww.logpoint.com%2Fdownload%3Fr
↪%3Dheader')")
```

The above example decodes an escaped url and returns the decoded url, for example http://www.logpoint.com/download?r=header in the *decoded_url* identifier.

Fig. 10: Urldecode function

CHAPTER

ELEVEN

CRYPTOGRAPHIC FUNCTIONS

The **Cryptographic functions** evaluate hash functions and return a fixed-size alphanumeric string.

11.1 md5

This function accepts a string value *X* as input and returns the *md5* hash of the string value. The *md5* is a hash function that generates a 128-bit hash value of the string.

Syntax:

```
| process eval("identifier=md5(X)")
```

Example:

```
| process eval("hash=md5(device_name)")
```

The above example converts the value of the *device_name* field into its corresponding *md5* hash value and returns the value *421AA90E079FA326B6494F812AD13E79* in the *hash* identifier.

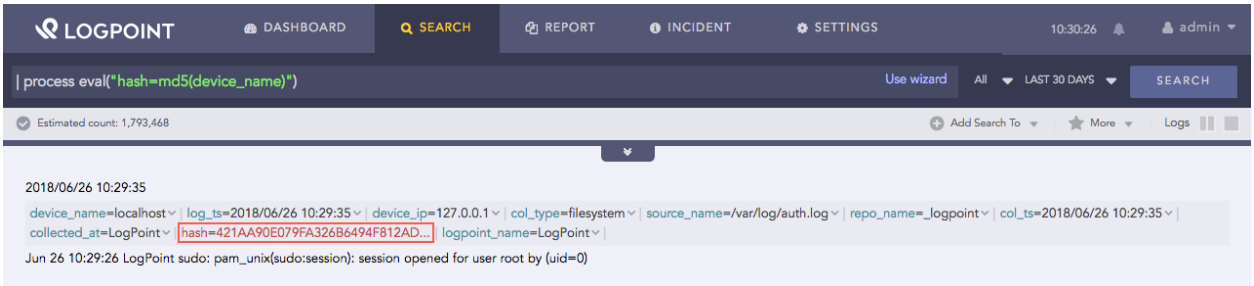


Fig. 1: Md5 function

11.2 sha1

This function accepts a string value *X* and returns the **sha1** hash of the string value. The **sha1** is a cryptographic hash function that generates a 160-bit (20-byte) hash value, typically rendered as a hexadecimal number, 40 digits long.

Syntax:

```
| process eval("identifier=sha1(X)")
```

Example:

```
| process eval("sha1_value=sha1(device_name)")
```

The above example returns the corresponding *sha1* hash value of *device_name* in the *sha1_value* identifier.

Fig. 2: Sha1 function

11.3 sha256

This function accepts a string value *X* and returns the **sha256** hash of a value. The **sha256** is a cryptographic hash function that generates an almost-unique 256-bit (32-byte) hash value, typically rendered as a hexadecimal number, 64 digits long.

Syntax:

```
| process eval("identifier=sha256(X)")
```

Example 1:

```
| process eval("sha256_value=sha256(device_name)")
```

The above example returns the corresponding *sha256* hash value of the *device_name* in the *sha256_value* identifier.

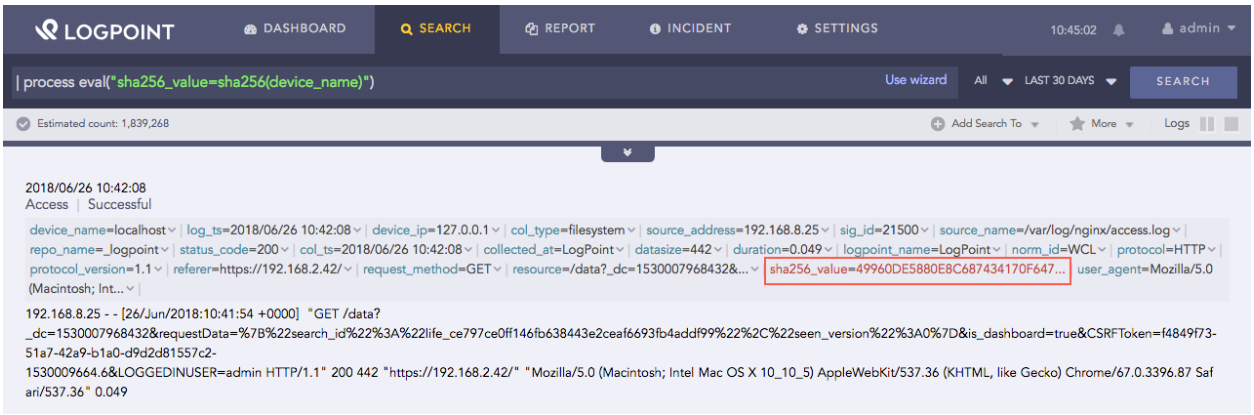


Fig. 3: Sha256 function

11.4 sha512

This function accepts a string value *X* and returns the **sha512** hash of a value. The **sha512** is a cryptographic hash function that generates an almost-unique 512-bit (32-byte) hash value, typically rendered as a hexadecimal number, 128 digits long.

Syntax:

```
| process eval("identifier=sha512(X)")
```

Example:

```
| process eval("sha512_value=sha512(device_name)")
```

The above example returns the corresponding *sha512* hash value of the *device_name* in the *sha512_value* identifier.

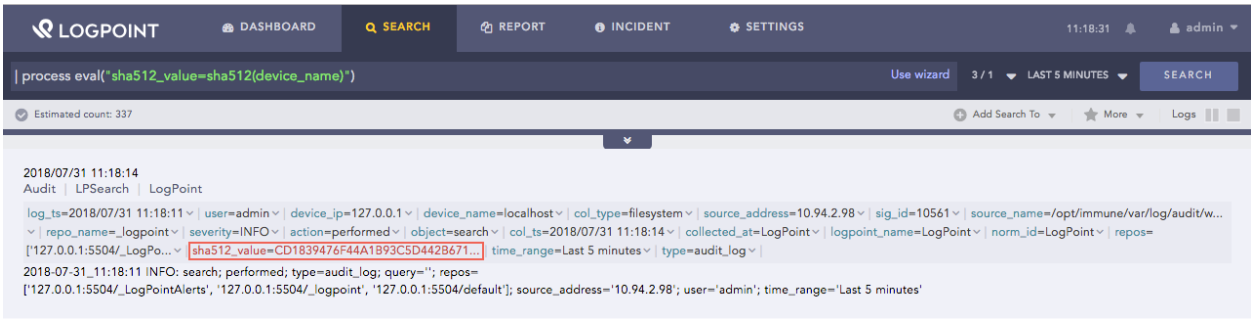


Fig. 4: Sha512 function

CHAPTER

TWELVE

MATHEMATICAL FUNCTIONS

The **Mathematical functions** evaluate mathematical data.

12.1 abs

This function accepts a numerical value *X* as input and returns the absolute value of the number as the output.

Syntax:

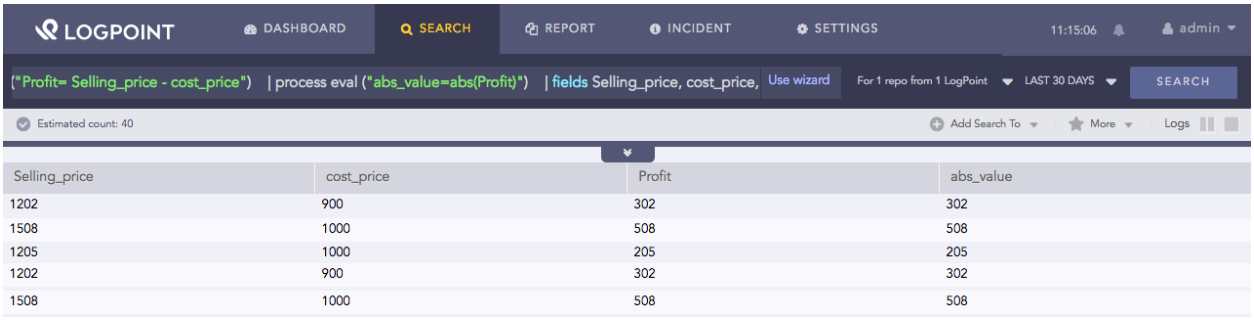
```
| process eval("identifier=abs(X)")
```

Example:

```
| process eval ("Profit= Selling_price - cost_price")
| process eval ("abs_value=abs(Profit)")
| fields Selling_price, cost_price, Profit, abs_value
```

The above example first calculates value for a *Profit* field. It then computes the absolute value of the *Profit* field and returns its value in the *abs_value* identifier.

The fields command displays the value of Selling_price, cost_price, Profit and abs_value in a tabular form.



Selling_price	cost_price	Profit	abs_value
1202	900	302	302
1508	1000	508	508
1205	1000	205	205
1202	900	302	302
1508	1000	508	508

Fig. 1: Abs function

12.2 floor

This function accepts a numerical value *X* as input and returns the greatest integer less than or equal to *X*.

Syntax:

```
| process eval("identifier=floor(X)")
```

Example:

```
| process eval("price_per_unit=Selling_price/unit_sold")
| process eval("final_price = floor(price_per_unit)")
| fields Selling_price, unit_sold, price_per_unit, final_price
```

The above example first calculates value for a *price_per_unit* field. It then computes the greatest integer less than or equal to the value of *Profit* field and returns its value in the *final_price* identifier.

The *fields* command displays the value of *Selling_price*, *cost_price*, *Profit*, and *abs_value* in a tabular form.

Selling_price	unit_sold	price_per_unit	final_price
1202	4	300.5	300
1400	14	100	100
1207	2	603.5	603
1508	20	75.4	75
1205	6	200.83	200

Fig. 2: Floor function

12.3 ceiling

This function accepts a numerical value *X* as input and rounds the number up to the smallest following integer value.

Syntax:

```
| process eval("identifier=ceiling(X)")
```

Example:

```
| process eval("ceiling_duration=ceiling(duration)")
```

The above example accepts the value of the *duration* field and returns the smallest following integer value in the *ceiling_duration* identifier.

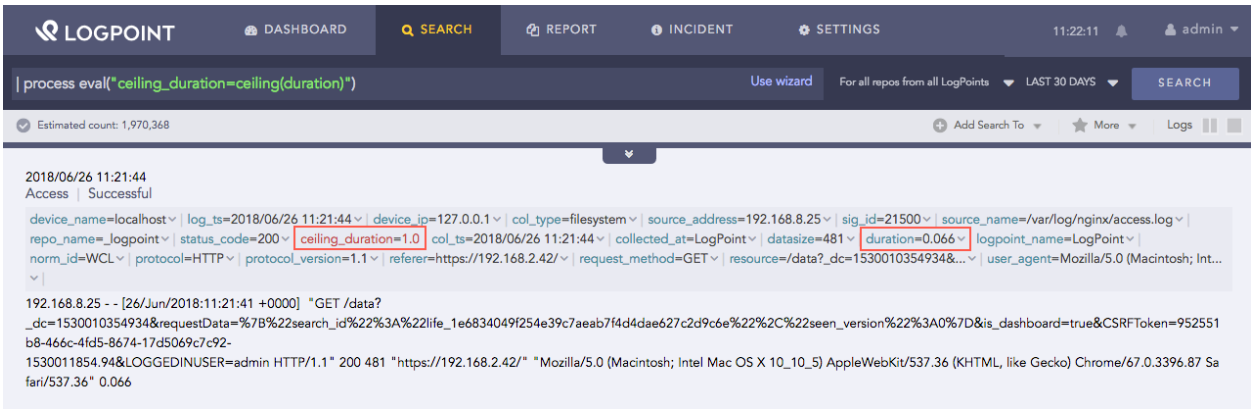


Fig. 3: Ceiling function

12.4 exp

This function accepts a numerical value X as input and evaluates the exponentiation with base e and X as the exponent, (e^X). You can also use the function expe instead of the function exp.

Syntax:

```
| process eval("identifier=exp(X)")
or
| process eval("identifier=expe(X)")
```

Example:

```
| process eval("result=exp(discount)") | fields discount, result
or
| process eval("result=expe(unit_sold)") | fields unit_sold, result
```

The above example evaluates the exponentiation to the base *e* of the *discount* field and returns it in the *result* identifier.

The *fields* command displays the value of *discount* and *result* in a tabular form.

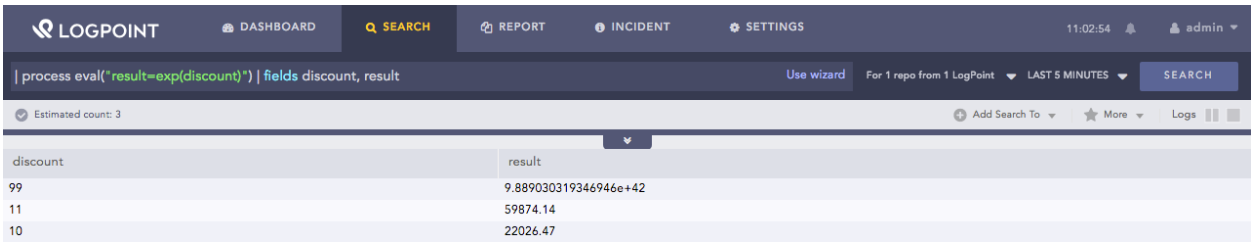


Fig. 4: Exp function

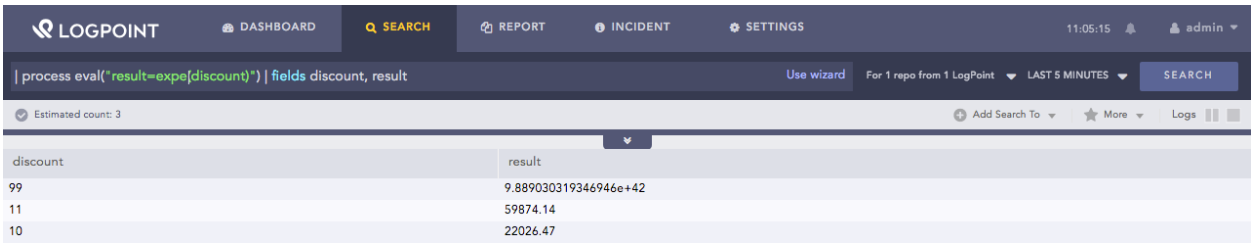


Fig. 5: Expe function

12.5 exp2

This function accepts a numerical value X as input and evaluates the exponentiation with base 2 and X as the exponent, (2^X).

Syntax:

```
| process eval("identifier=exp2(X)")
```

Example:

```
| process eval("result=exp2(unit_sold)") | fields unit_sold, result
```

The above example evaluates the exponentiation to the base *2* of the *unit_sold* field and returns it in the *result* identifier.

The *fields* command displays the value of *unit_sold* and *result* in a tabular form.

Fig. 6: Exp2 function

12.6 exp10

This function accepts a numerical value X as input and evaluates the exponentiation with base 10 and X as the exponent, (10^X).

Syntax:

```
| process eval("identifier=exp10(X)")
```

Example:

```
| process eval("result=exp10(unit_sold)") | fields unit_sold, result
```

The above example evaluates the exponentiation to the base *10* of the *unit_sold* field and returns it in the *result* identifier.

The *fields* command displays the value of *unit_sold* and *result* in a tabular form.

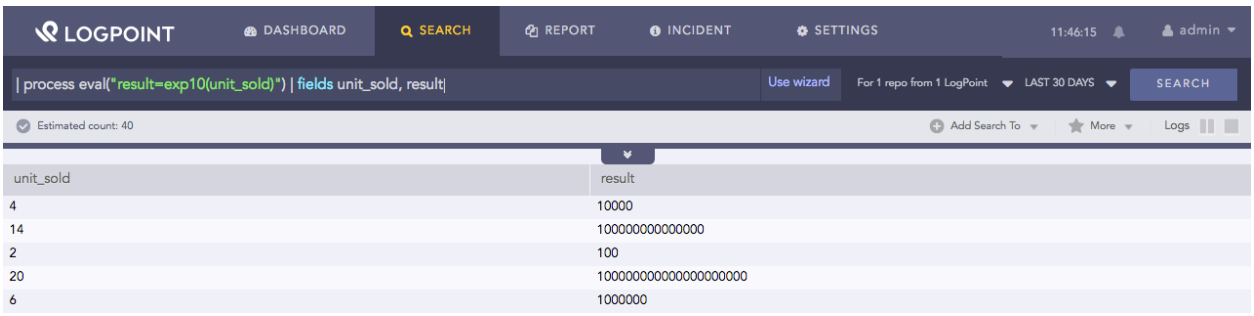


Fig. 7: Exp10 function

12.7 log

This function accepts a numerical value X as input and evaluates the logarithm of X with base e, (log_e(X)). You can also use the function loge instead of the function log.

Syntax:

```
| process eval("identifier=log(X)")
or
| process eval("identifier=loge(X)")
```

Example:

```
| process eval("result=log(unit_sold)") | fields unit_sold, result
or
| process eval("result=loge(unit_sold)") | fields unit_sold, result
```

The above example evaluates the logarithm to the base *e* of the *unit_sold* field and returns it in the *result* identifier.

The *fields* command displays the value of *unit_sold* and *result* in a tabular form.

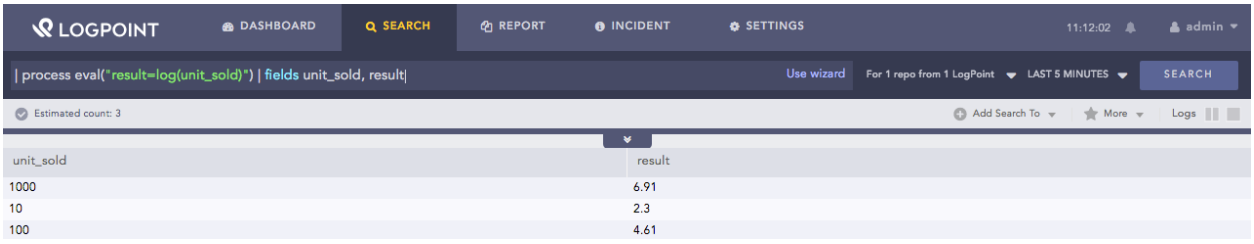


Fig. 8: Log function

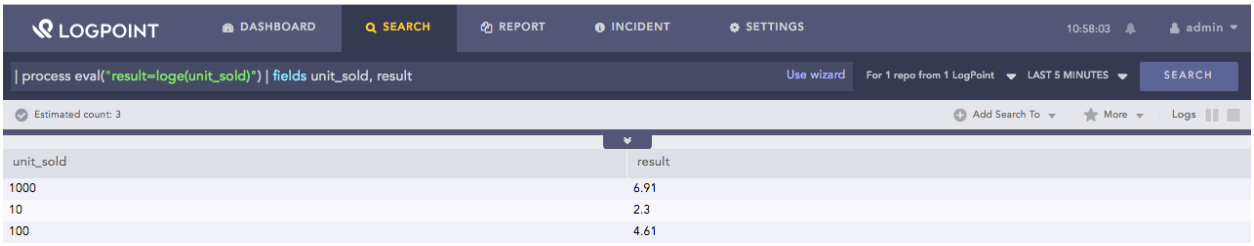


Fig. 9: Loge function

12.8 log2

This function accepts a numerical value X as input and evaluates the logarithm of X with base 2, (log_2(X)).

Syntax:

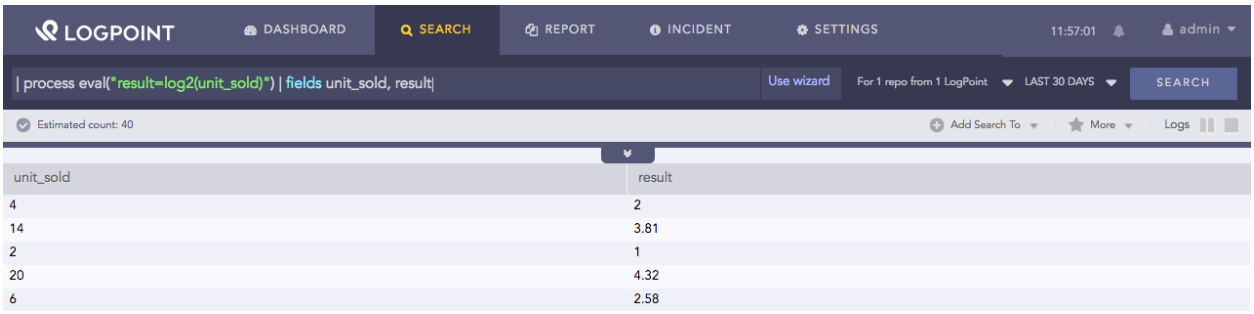
```
| process eval("identifier=log2(X)")
```

Example:

```
| process eval("result=log2(unit_sold)") | fields unit_sold, result
```

The above example evaluates the logarithm to the base *2* of the *unit_sold* field and returns it in the *result* identifier.

The *fields* command displays the value of *unit_sold* and *result* in a tabular form.



unit_sold	result
4	2
14	3.81
2	1
20	4.32
6	2.58

Fig. 10: Log2 function

12.9 log10

This function accepts a numerical value X as input and evaluates the logarithm of X with base 10, (log_{mathrm{10}} (X)).

Syntax:

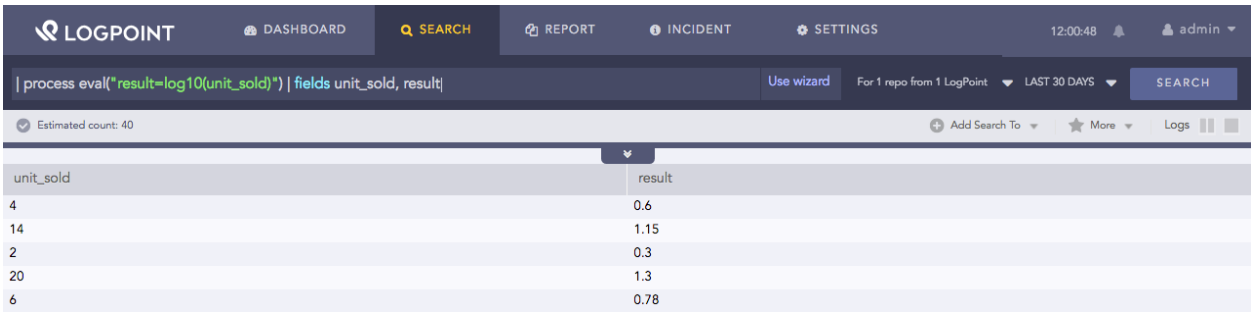
```
| process eval("identifier=log10(X)")
```

Example:

```
| process eval("result=log10(unit_sold)") | fields unit_sold, result
```

The above example evaluates the logarithm to the base *10* of the *unit_sold* field and returns it in the *result* identifier.

The *fields* command displays the value of *unit_sold* and *result* in a tabular form.



unit_sold	result
4	0.6
14	1.15
2	0.3
20	1.3
6	0.78

Fig. 11: Log10 function

12.10 pi

This function returns the first 12 digits of the value of pi. Unlike other functions, this function does not take any argument.

Syntax:

```
| process eval("identifier=pi()")
```

Example:

```
| process eval ("area_circle=pi() * (radius^2)")
| chart count () by radius, area_circle
```

The above example calculates the area of the circle where *pi()* gives the value of the mathematical constant (**π**). The function returns area in the *area_circle* identifier.

The *chart count()* command displays the *count* of the combination of *radius* and *area_circle* values as a chart and in a tabular form.

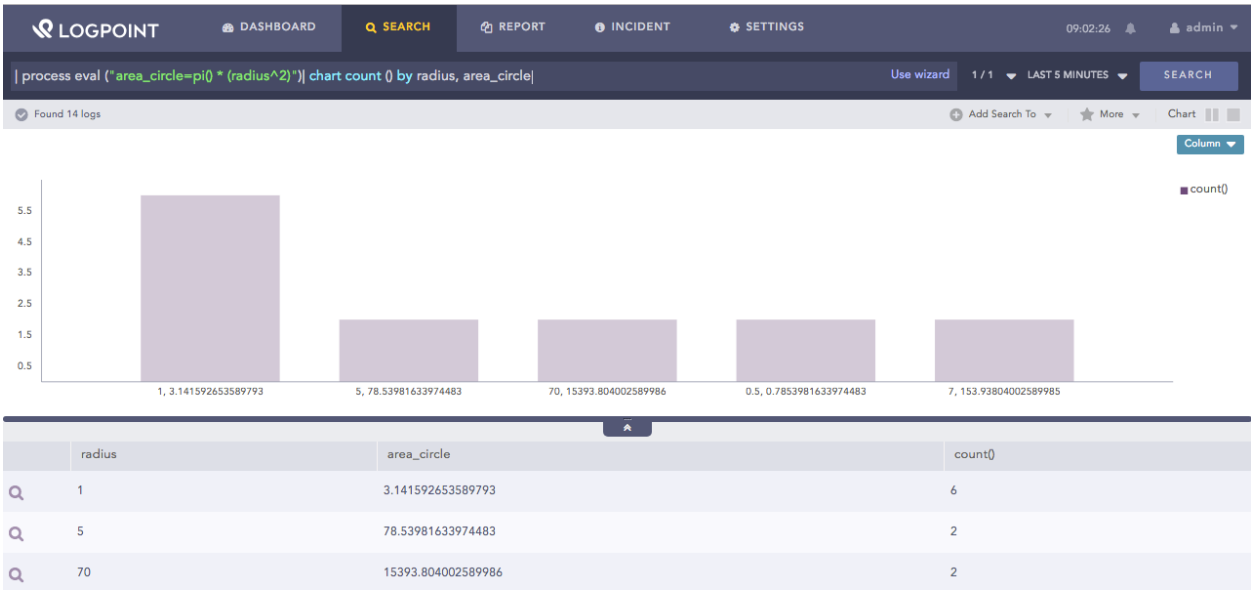


Fig. 12: pi function

12.11 sqrt

This function accepts a numeric value *X* as input and returns the square root of the numeric value.

Syntax:

```
| process eval("identifier=sqrt(X)")
```

Example:

```
| process eval("result=sqrt(unit_sold)") | fields unit_sold, result
```

The above example returns the square root of the value of the *unit_sold* field in the *unit_sold* identifier.

The *fields* command displays the value of *unit_sold* and *result* in a tabular form.

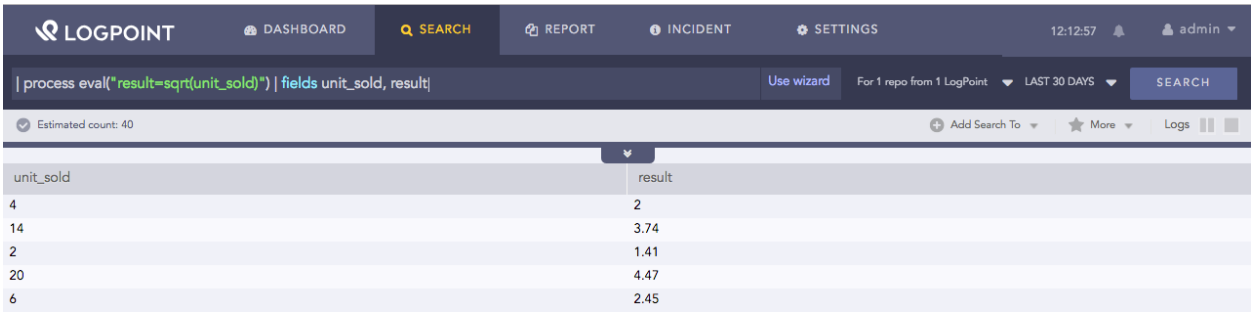


Fig. 13: Sqrt function

12.12 random

This function returns a random number ranging between 0 and 1. It does not take any argument. You can use this function in case you want a random number for any eval expression.

Syntax:

```
| process eval("identifier=random()")
```

Example:

```
| process eval("x=random()")
```

The above example returns a random number between 0 and 1 in the *x* identifier.

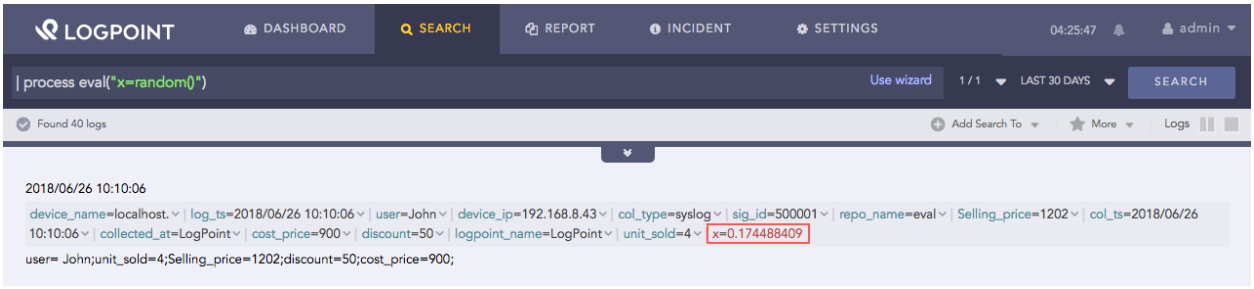


Fig. 14: Random function

12.13 exact

This function accepts a numeric calculation *X* as input and returns a result with a significant amount of precision.

Syntax:

```
| process eval("identifier=exact(X)")
```

Example:

```
| process eval("result=exact(3.4*unit_sold)") | fields unit_sold, result
```

The above example returns the precise value of the arithmetic expression *3.4*unit_sold* in the *result* identifier.

The *fields* command displays the value of *unit_sold* and *result* in a tabular form.

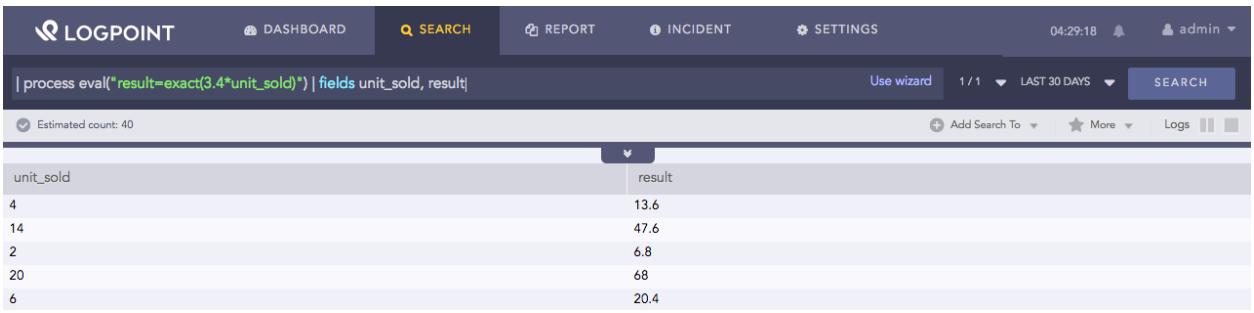


Fig. 15: Exact function

12.14 round

This function accepts up to two numeric arguments, *X* and *Y*, as inputs. It then rounds the value specified in *X* by the amount of decimal specified in *Y*. Here *Y* is optional, and in case *Y* is not defined, it rounds the value of *X* to the nearest integer by default.

Syntax:

```
| process eval("identifier=round(X,Y)")
```

Example 1:

```
| process eval("x=round(12.233)")

Result: x=12
```

Example 2:

```
process eval("result=round(12.234,2)")
```

The above example rounds up *12.234* to the hundredths (second decimal place) and returns its value in the *result* identifier.

Fig. 16: Round function

12.15 sigfig

This function accepts one numeric field *X* as input and rounds that number to the appropriate number of significant figures.

Syntax:

```
process eval("identifier=sigfig(X)")
```

If X is of 1000th place, the function rounds it to the nearest 10.

Example 1:

```
process eval("result=sigfig(1111)")
```

The above example rounds up *1111* to the nearest 10 and returns its value, i.e., 1110 in the *result* identifier.

Fig. 17: Sigfig function

If X is of 10000th place, the function rounds it to the nearest 100.

Example 2:

```
process eval("x=sigfig(11111)")
```

The above example rounds up *11111* to the nearest 100 and returns its value, i.e., *11100* in the *result* identifier.

Note: This function accepts only integer value as input. It ignores the decimal numbers if provided and takes only the numbers before the decimal point. It does not round the number that is in the 10th and 100th place.

CHAPTER

THIRTEEN

TRIGONOMETRIC FUNCTIONS

The **Trigonometric functions** evaluate trigonometric and hyperbolic values.

13.1 sin

This function accepts one argument *X* as input and returns the sine of *X*.

Syntax:

```
| process eval("identifier=sin(X)")
```

Example:

```
| process eval("sin_value=sin(length)") | fields length, sin_value
```

The above example returns the sine of the *length* field in the *sin_value* identifier.

The *fields* command displays the value of *length* and *sin_value* in a tabular form.

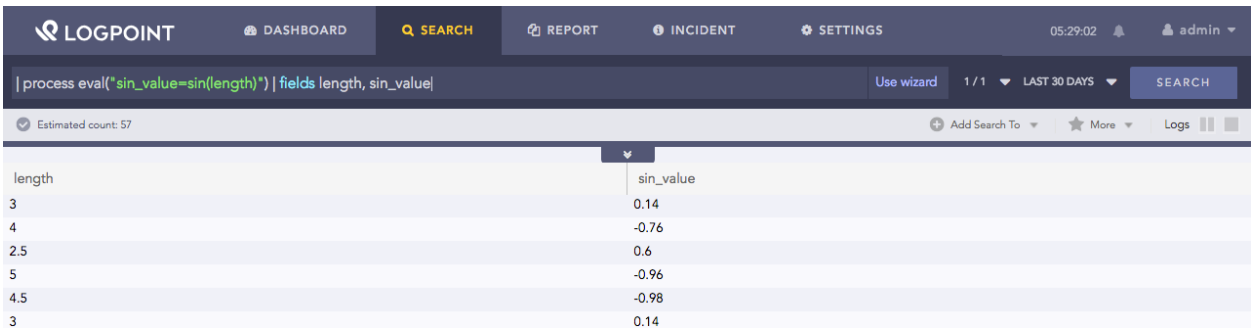


Fig. 1: Sin function

13.2 sinh

This function accepts one argument *X* as input and returns the hyperbolic sine of *X*.

Syntax:

```
| process eval("identifier=sinh(X)")
```

Example:

```
| process eval("sinh_value=sinh(length)") | fields length, sinh_value
```

The above example returns the hyperbolic sine of the *length* field in the *sinh_value* identifier.

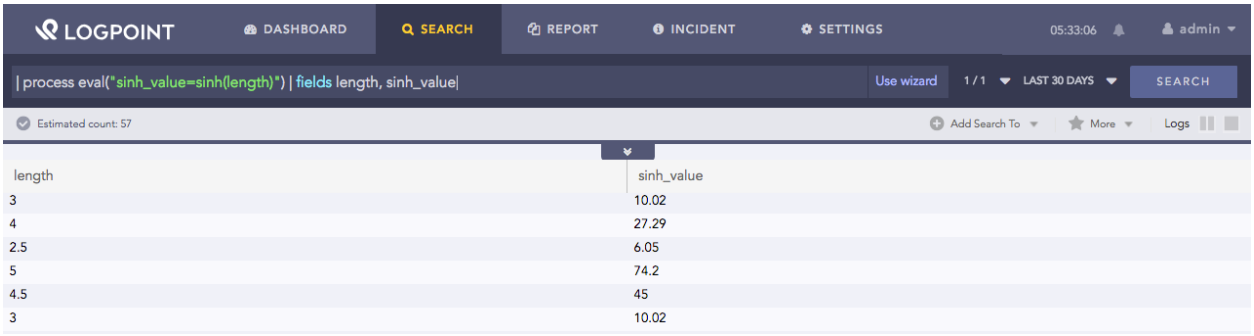


Fig. 2: Sinh function

13.3 asin

This function accepts one argument *X* as input and returns the inverse sine of *X*. *X* must be in the range from -1 to 1 inclusive.

Syntax:

```
| process eval("identifier=asin(X)")
```

Example:

```
| process eval("asin_value=asin(1)")
```

The above example returns the inverse sine of *1* in the *asin_value* identifier.

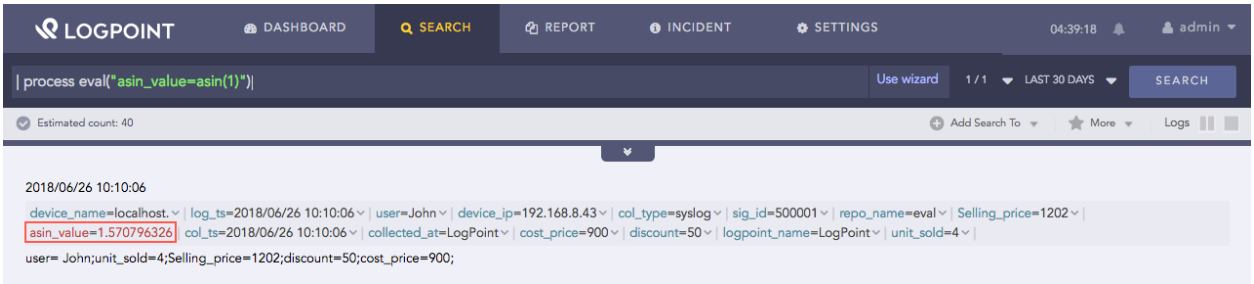


Fig. 3: Asin function

13.4 asinh

This function accepts one argument *X* as input and returns the inverse hyperbolic sine of *X*.

Syntax:

```
| process eval("identifier=asinh(X)")
```

Example:

```
| process eval("asinh_value=asinh(1)")
```

The above example returns the inverse hyperbolic sine of *1* in the *asinh_value* identifier.

Fig. 4: Asinh function

13.5 cos

This function accepts one argument *X* as input and returns the cosine of *X*.

Syntax:

```
| process eval("identifier=cos(X)")
```

Example:

```
| process eval("cos_value=cos(length)") | fields length, cos_value
```

The above example returns the cosine of the *length* field in the *cos_value* identifier.

The *fields* command displays the value of *length* and *cos_value* in a tabular form.

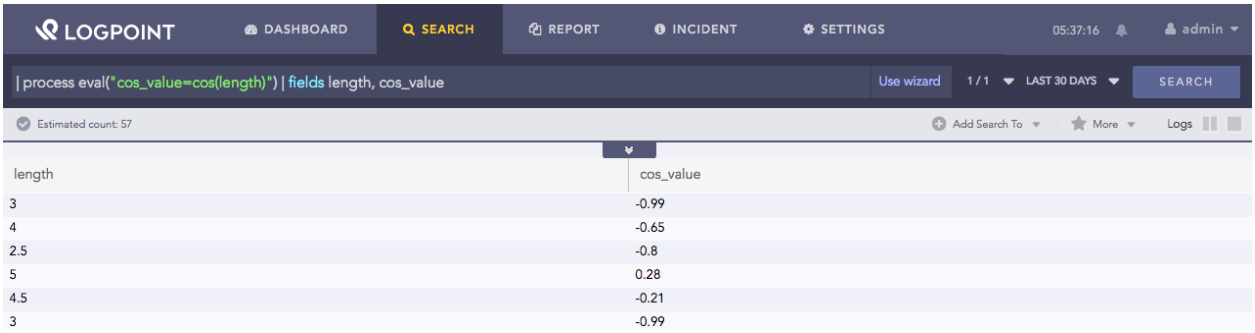


Fig. 5: Cos function

13.6 cosh

This function accepts one argument *X* as input and returns the hyperbolic cosine of *X*.

Syntax:

```
| process eval("identifier=cosh(X)")
```

Example:

```
| process eval("cosh_value=cosh(length)") | fields length, cosh_value
```

The above example returns the hyperbolic cosine of the *length* field in the *cosh_value* identifier.

The *fields* command displays the value of *length* and *cosh_value* in a tabular form.

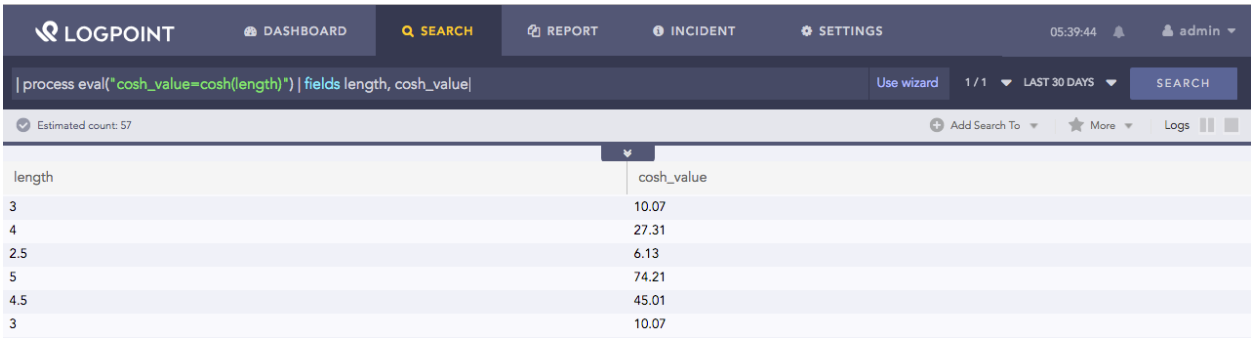


Fig. 6: Cosh function

13.7 acos

This function accepts one argument *X* as input and returns the inverse cosine of *X*. *X* must be in the range from -1 to 1 inclusive.

Syntax:

```
| process eval("identifier=acos(X)")
```

Example:

```
| process eval("acos_value=acos(0)")
```

The above example returns the inverse cosine of *0* in the *acos_value* identifier.

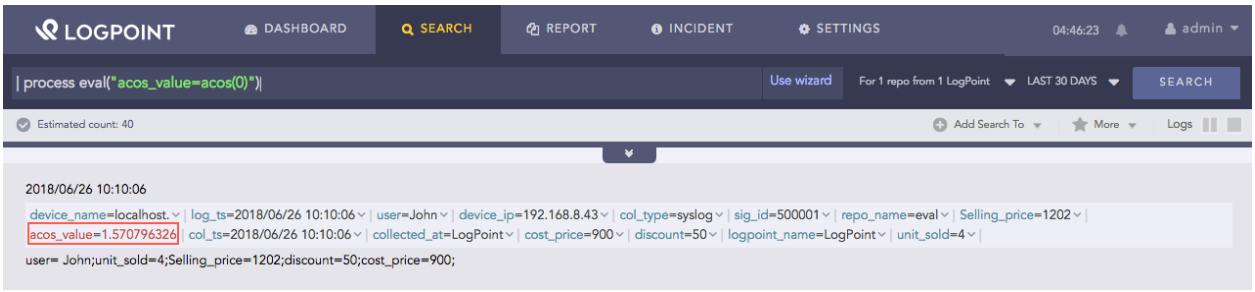


Fig. 7: Acos function

13.8 acosh

This function accepts one argument *X* as input and returns the inverse hyperbolic cosine of *X*.

Syntax:

```
| process eval("identifier=acosh(X)")
```

Example:

```
| process eval("acosh_value=acosh(1)")
```

The above example returns the inverse hyperbolic cosine of *1* in the *acosh_value* identifier.

Fig. 8: Acosh function

13.9 tan

This function accepts one argument *X* as input and returns the tangent of *X*.

Syntax:

```
process eval("identifier=tan(X)")
```

Example:

```
process eval("tan_value=tan(length)")
fields length, tan_value
```

The above example returns the tangent of the *length* field in the *tan_value* identifier.

The *fields* command displays the value of *length* and *tan_value* in a tabular form.

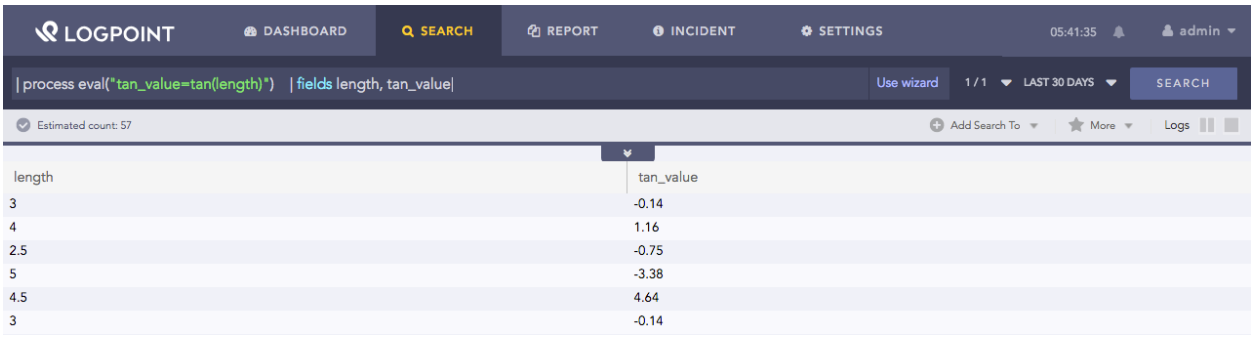


Fig. 9: Tan function

13.10 tanh

This function accepts one argument *X* as input and returns the hyperbolic tangent of *X*.

Syntax:

```
process eval("identifier=tanh(X)")
```

Example:

```
process eval("tanh_value=tanh(length)")
fields length, tanh_value
```

The above example returns the hyperbolic tangent of the *length* field in the *tanh_value* identifier.

The *fields* command displays the value of *length* and *tanh_value* in a tabular form.

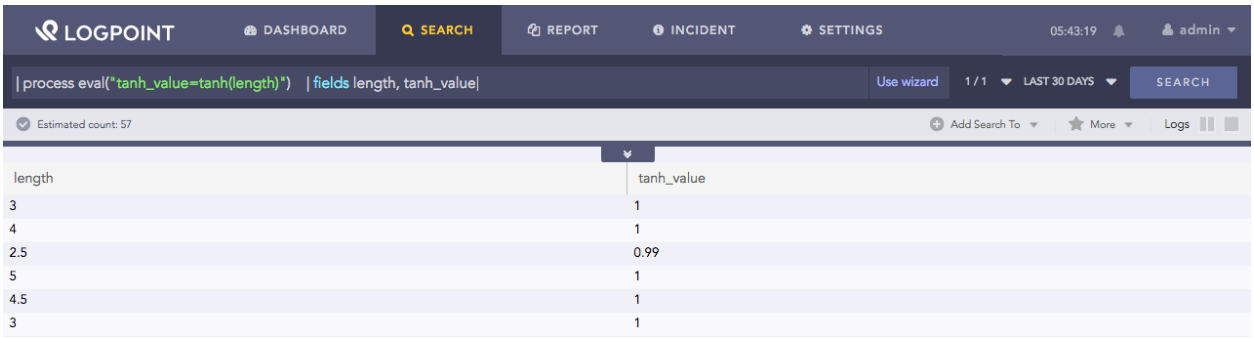


Fig. 10: Tanh function

13.11 atan

This function accepts one argument *X* as input and returns the inverse tangent of *X*.

Syntax:

```
| process eval("identifier=atan(X)")
```

Example:

```
| process eval("atan_value=atan(1)")
```

The above example returns the inverse tangent of *1* in the *atan_value* identifier.

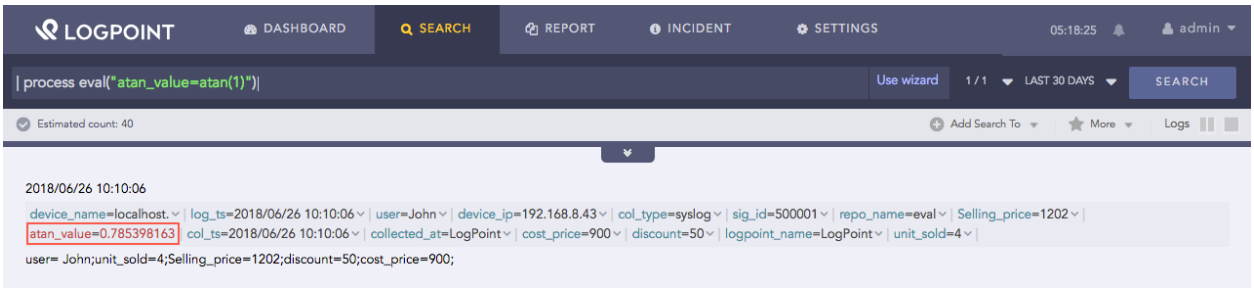


Fig. 11: Atan function

13.12 atanh

This function accepts one argument *X* as input and returns the inverse hyperbolic tangent of *X*.

Syntax:

```
| process eval("identifier=atan(X)")
```

Example:

```
| process eval("atanh_value=atanh(1)")
```

The above example returns the inverse hyperbolic tangent of *1* in the *atanh_value* identifier.

Fig. 12: Atanh function

13.13 hypot

This function accepts two arguments X and Y as inputs and returns the hypotenuse of a right-angled triangle whose length and base are X and Y. It follows the equation of the Pythagorean theorem, (hypotenuse = sqrt{length^2 + base^2}).

Syntax:

```
| process eval("identifier=hypot(X,Y)")
```

Example:

```
| process eval("hyp=hypot(3,4)")
```

The above example calculates the value of the hypotenuse of the triangle whose length and base are *3* and *4* respectively and returns its value in the *tan_value* identifier.

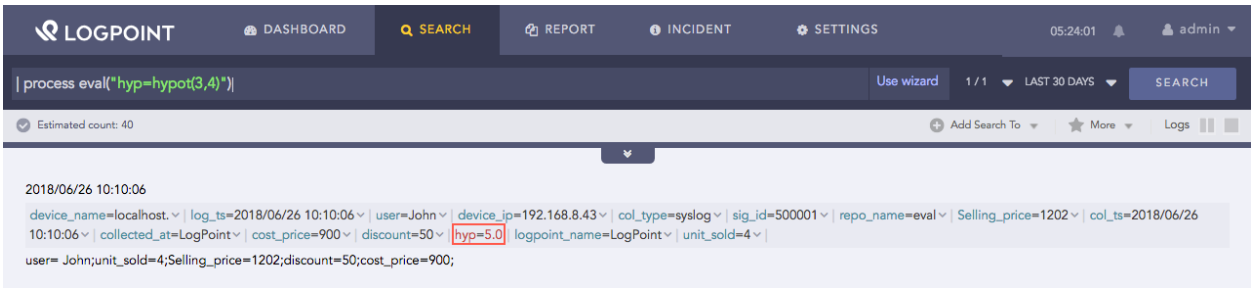


Fig. 13: Hypot function

CHAPTER

FOURTEEN

DATE/TIME FUNCTIONS

The **Date/Time functions** evaluate the date and time values in the YYYY/MM/DD format. You can customize the date/time format as per the provided **Date/Time patterns** in this page.

14.1 now

This function returns the UNIX time when the search starts. Unlike other functions, this function does not take any argument.

Syntax:

```
| process eval("identifier=now()")
```

Example:

```
| process eval("search_time=now()")
```

The above example returns the UNIX time of the search process in the *search* identifier.

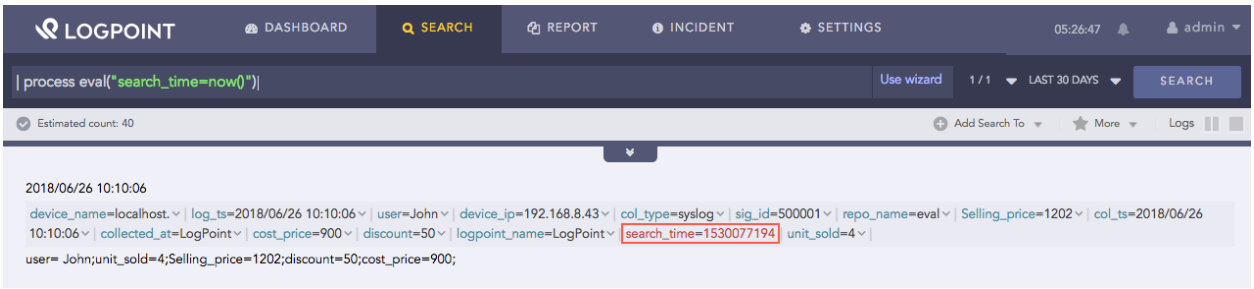


Fig. 1: Now function

14.2 relative_time

This function accepts two arguments, a UNIX time *X*, and a relative time specifier *Y* as inputs, and returns a UNIX time by adding or deducting the value of *Y* from the value of *X*.

Syntax:

```
| process eval("identifier=relative_time(X, Y)")
```

- The operator used in *Y* can be either + or -.
- The format specifier of time is *s* for a second, *m* for a minute, *h* for an hour, *d* for a day and *w* for a week.

Example:

```
| process eval("result=relative_time(now(), '+1d')")
```

The above example adds time equivalent of 1 day to the current UNIX time and returns it in the *result* identifier.

Fig. 2: Relative time function

14.3 strftime

This function accepts a UNIX time *X* and returns the time as a string using the date and time format specified in *Y*. The UNIX time value must be in seconds.

Syntax:

```
| process eval("identifier=strftime(X, Y)")
```

Example:

```
| process eval("search_date=strftime(now(), 'YYYY/MM/DD')")
```

The above example accepts the current UNIX time and returns the time in *YYYY/MM/DD* format in the *search_date* identifier.

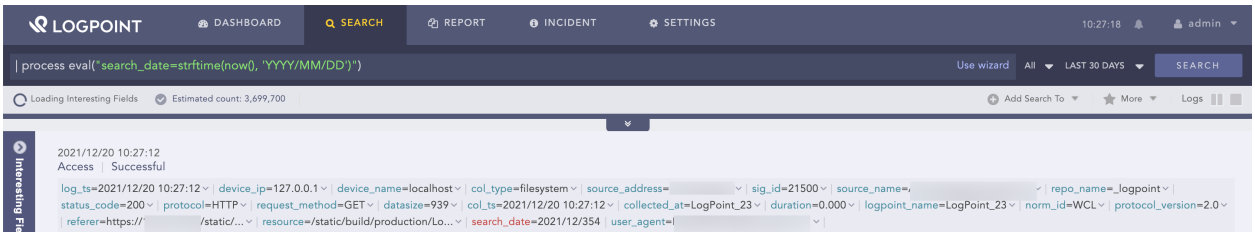


Fig. 3: Strftime function for day in year

Example:

```
| process eval("search_date=strftime(now(), 'YYYY/MM/dd')")
```

The above example accepts the current UNIX time and returns the time in *YYYY/MM/dd* format in the *search_date* identifier.

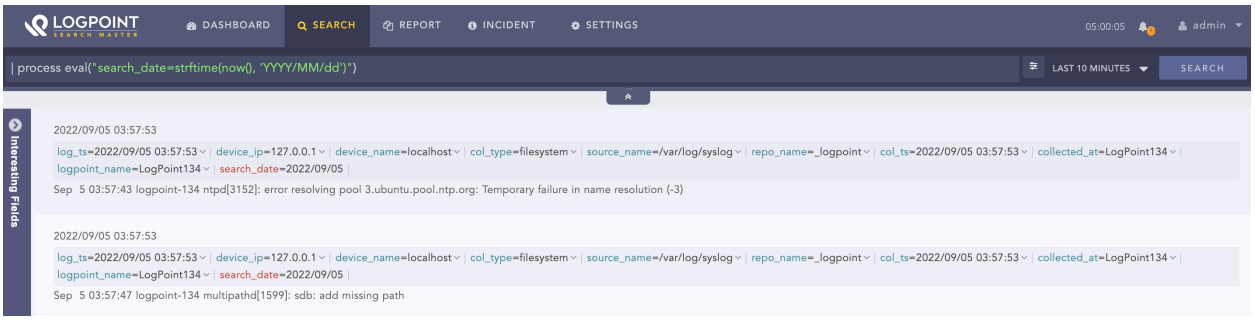


Fig. 4: Strftime function for day in month

The **Timezone** parameter in the strptime function converts date and time values based on timezone, defined by a fixed offset from Greenwich Mean Time (GMT). By default, the timezone of a machine is used for the conversion. It is an optional parameter.

Syntax:

```
GMTOffsetTimeZone:
        GMT Sign Hours : Minutes
    Sign: one of
        + -
    Hours:
        Digit
        Digit Digit
```

(continues on next page)

(continued from previous page)

```
Minutes:
    Digit Digit
Digit: one of
    0 1 2 3 4 5 6 7 8 9
```

Example:

```
| process eval("identifier=strftime(now(), 'yyyy-MM-dd hh:mm:ss', 'GMT+4:45')")
```

14.4 strptime

This function accepts a human readable time specified in *X* and converts it into a UNIX timestamp using the date and time format specified in *Y*.

Syntax:

```
| process eval("identifier=strptime(X, Y)")
```

Example:

```
| process eval("searchtime=strptime('2017-12-12', 'yyyy-mm-dd')")
```

The above example accepts the human readable time and converts it to a UNIX timestamp. It returns the converted time in the *searchtime* identifier.

Fig. 5: Strptime function

The **Timezone** parameter in the strptime function converts date and time values based on timezone, defined by a fixed offset from Greenwich Mean Time (GMT). By default, the timezone of a machine is used for the conversion. It is an optional parameter.

Syntax:

```
GMTOffsetTimeZone:
    GMT Sign Hours : Minutes
```

(continues on next page)

(continued from previous page)

```
Sign: one of
        + -
Hours:
        Digit
        Digit Digit
Minutes:
        Digit Digit
Digit: one of
        0 1 2 3 4 5 6 7 8 9
```

Example:

```
| process eval("identifier=strptime('2022-08-12', 'yyyy-MM-dd', 'GMT-9:45')")
```

14.5 time

This function takes no argument and returns the UNIX time on which the eval process command processes the command. The returned time is the time when the eval command processed the event.

Syntax:

```
| process eval("identifier=time()")
```

Example:

```
| process eval("process_time=time()")
```

The above example returns the time of the eval command execution in the *process_time* identifier.

Fig. 6: Time function

14.6 Date/Time patterns

The list of all possible patterns in the date/time function.

Letter	Date or Time Component	Presentation	Examples
G	Era designator	Text	AD
y	Year	Year	1996; 96
Y	Week year	Year	2009; 09
M	Month in year (context sensitive)	Month	July; Jul; 07
L	Month in year (standalone form)	Month	July; Jul; 07
w	Week in year	Number	27
W	Week in month	Number	2
D	Day in year	Number	189
d	Day in month	Number	10
F	Day of week in month	Number	2
E	Day name in week	Text	Tuesday; Tue
u	Day number of week (1 = Monday, …, 7 = Sunday)	Number	1
a	Am/pm marker	Text	PM
H	Hour in day (0-23)	Number	0
k	Hour in day (1-24)	Number	24
K	Hour in am/pm (0-11)	Number	0
h	Hour in am/pm (1-12)	Number	12
m	Minute in hour	Number	30
s	Second in minute	Number	55
S	Millisecond	Number	978
z	Time zone	General time zone	Pacific Standard Time; PST; GMT-08:00
Z	Time zone	RFC 822 time zone	-0800
X	Time zone	ISO 8601 time zone	-08; -0800; -08:00

CHAPTER

FIFTEEN

INFORMATIONAL FUNCTIONS

The **Informational functions** evaluate the information of arguments.

15.1 isbool

This function accepts one argument *X* as input and returns *True* if the value of *X* is Boolean. If the value is not a Boolean, the function returns *False*.

Syntax:

```
process eval("identifier=isbool(X)")
```

Example:

```
process eval("is_loss=Selling_price<cost_price")
process eval("boolean_result=isbool(is_loss)")
chart count() by Selling_price, cost_price, is_loss, boolean_result
```

The above example first evaluates if the *Selling_price* is less than *cost_price* and returns its value in the *is_loss* identifier. Then, the *isbol* function returns *true* in the *boolean_result* identifier if the value in the *is_loss* field is Boolean. If the value is not a Boolean, the function returns False

The *chart count()* command displays the *count* of the combination of *Selling_price*, *cost_price*, *is_loss*, and *boolean_result* values as a chart and in a tabular form.

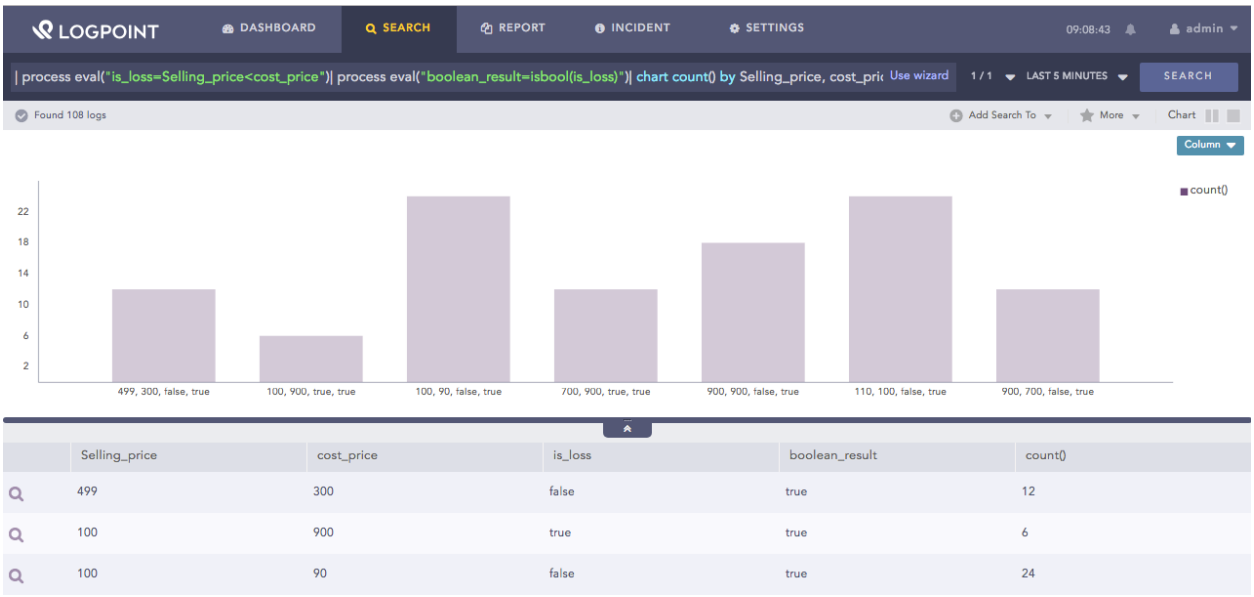


Fig. 1: Isbool function

15.2 isint

This function accepts one argument *X* as input and returns *True* if the value of *X* is an integer. If the value is not an integer, the function returns *False*.

Syntax:

```
| process eval("identifier=isint(X)")
```

Example:

```
| process eval("isscore_int=isint(score)") | fields score, isscore_int
```

The above example returns *true* in the *isscore_int* identifier if the value in the *score* field is an integer. If the value is not an integer, the function returns *False*.

The *fields* command displays the value of *score* and *isscore_int* in a tabular form.

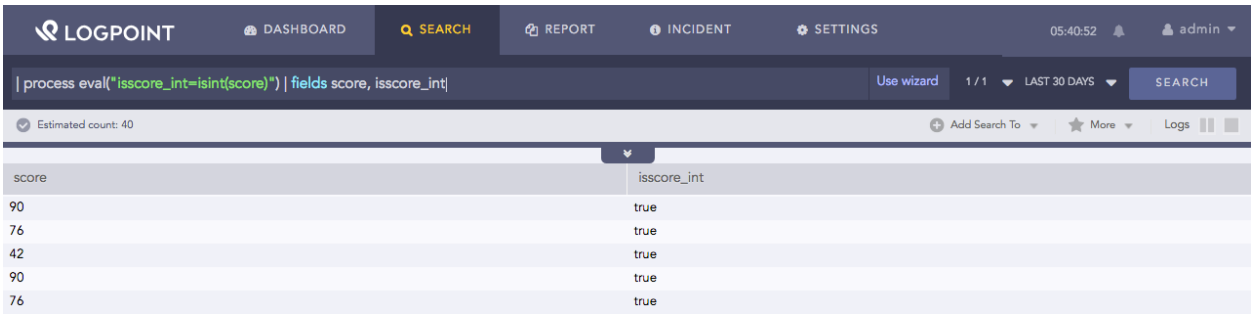


Fig. 2: Isint function

15.3 isnotnull

This function accepts one argument *X* as input and returns *True* if the value of *X* is not null. If the value is null, the function returns *False*.

Syntax:

```
| process eval("identifier=isnotnull(X)")
```

Example:

```
| process eval("is_loss=Selling_price<cost_price")
| process eval("notnull_result=isnotnull(is_loss)")
| chart count() by Selling_price, cost_price, is_loss, notnull_result
```

The above example first evaluates if the *Selling_price* is less than *cost_price* and returns its value in the *is_loss* identifier. Then, the *isnotnull* function returns *true* in the *notnull_result* identifier if the value in the *is_loss* field is not null. If the value is null, the function returns *False*.

The *chart count()* command displays the *count* of the combination of *Selling_price*, *cost_price*, *is_loss*, and *notnull_result* values as a chart and in a tabular form.

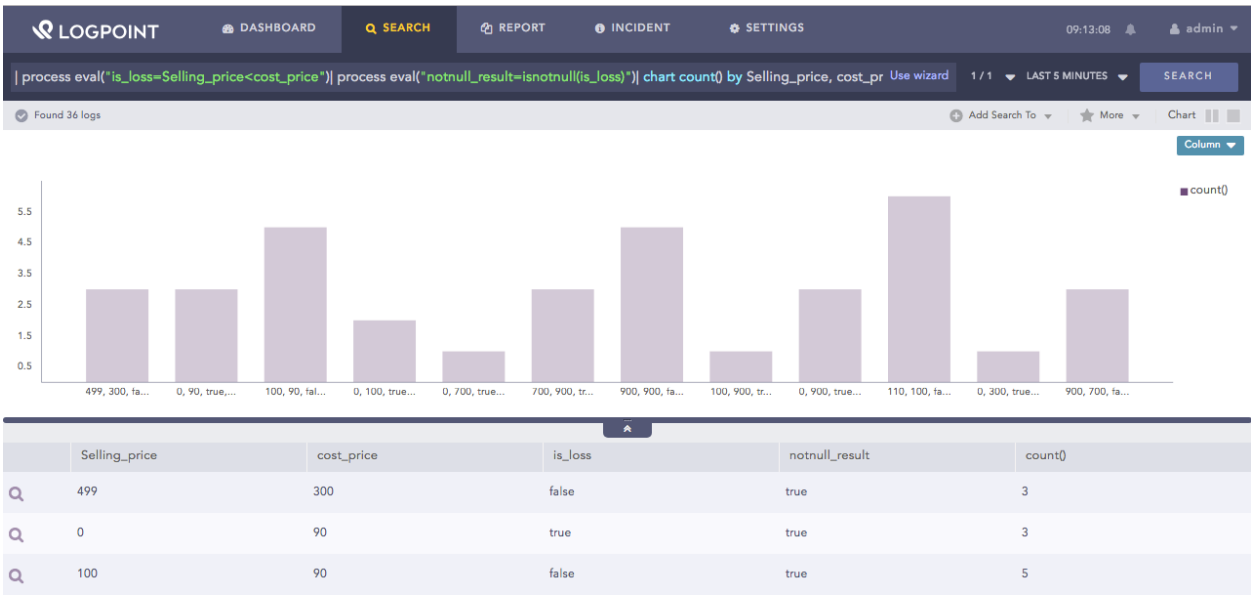


Fig. 3: Isnotnull function

15.4 isnull

This function accepts one argument *X* as input and returns *True* if the value of *X* is null. If the value is not null, the function returns *False*.

Syntax:

```
| process eval("identifier=isnull(X)")
```

Example:

```
| process eval("is_loss=Selling_price<cost_price")
| process eval("null_result=isnull(is_loss)")
| chart count() by Selling_price, cost_price, is_loss, null_result
```

The above example first evaluates if the *Selling_price* is less than *cost_price* and returns its value in the *is_loss* identifier. Then, the *isnull* function returns *true* in the *null_result* identifier if the value in the *is_loss* field is null. If the value is not null, the function returns *False*.

The *chart count()* command displays the *count* of the combination of *Selling_price*, *cost_price*, *is_loss*, and *null_result* values as a chart and in a tabular form.

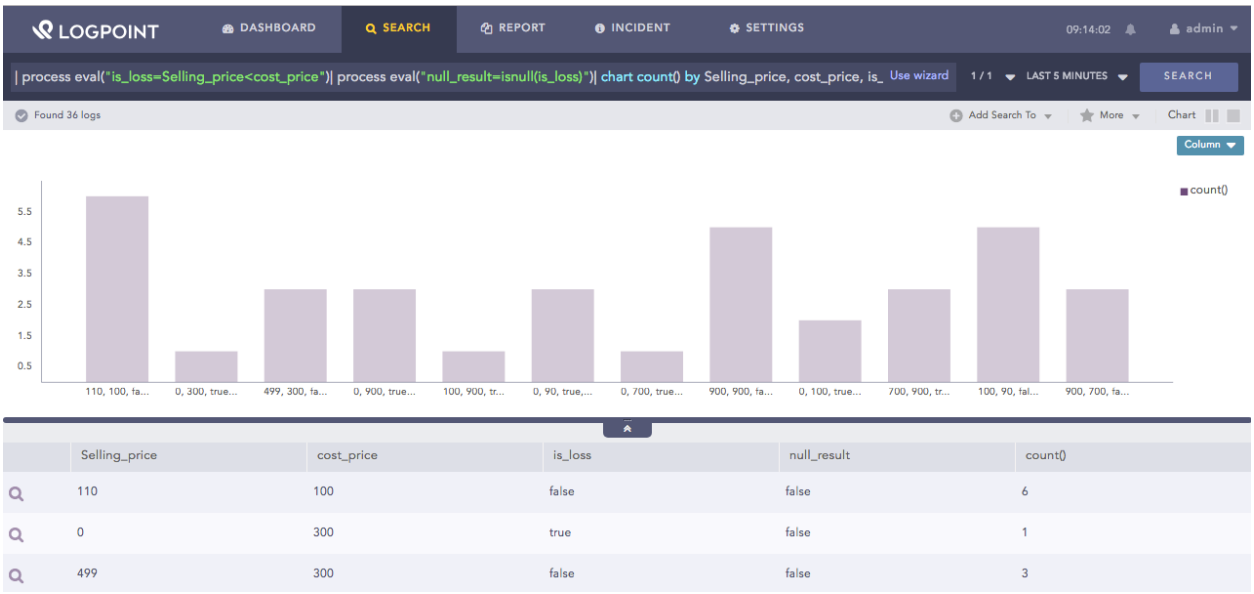


Fig. 4: Isnull function

15.5 isnum

This function accepts one argument *X* as input and returns *True* if the value of *X* is a number. If the value is not a number, the function returns *False*.

Syntax:

```
| process eval("identifier=isnum(X)")
```

Example:

```
| process eval("num_result=isnum(cost_price)") | chart count() by cost_price, num_result
```

The above example returns *true* in the *num_result* identifier if the value in the *score* field is a number. If the value is not a number, the function returns *False*.

The *chart count()* command displays the *count* of the combination of *cost_price* and *num_result* values as a chart and in a tabular form.

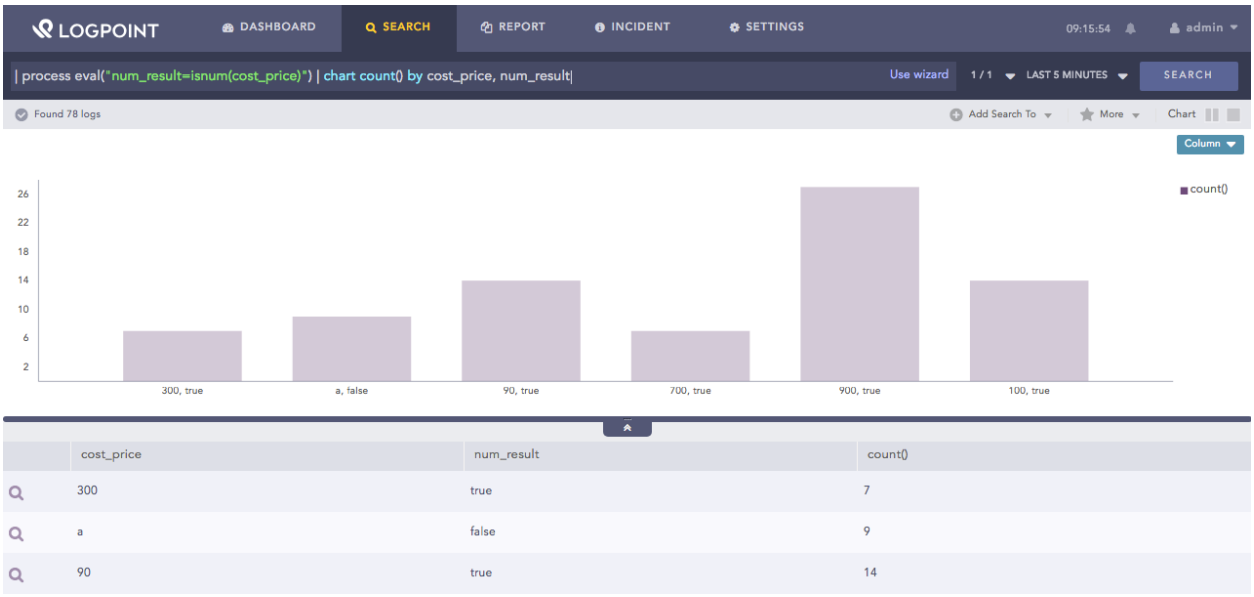


Fig. 5: Isnum function

15.6 isstr

This function accepts one argument *X* as input and returns *True* if the value of *X* is a string. If the value is not a string, the function returns *False*.

Syntax:

```
| process eval("identifier=isstr(X)")
```

Example:

```
| process eval("str_result=isstr(cost_price)") | chart count() by cost_price, str_result
```

The above example returns *true* in the *str_result* identifier if the value in the *cost_price* field is a string. If the value is not a string, the function returns *False*.

The *chart count()* command displays the *count* of the combination of *cost_price* and *str_result* values as a chart and in a tabular form.

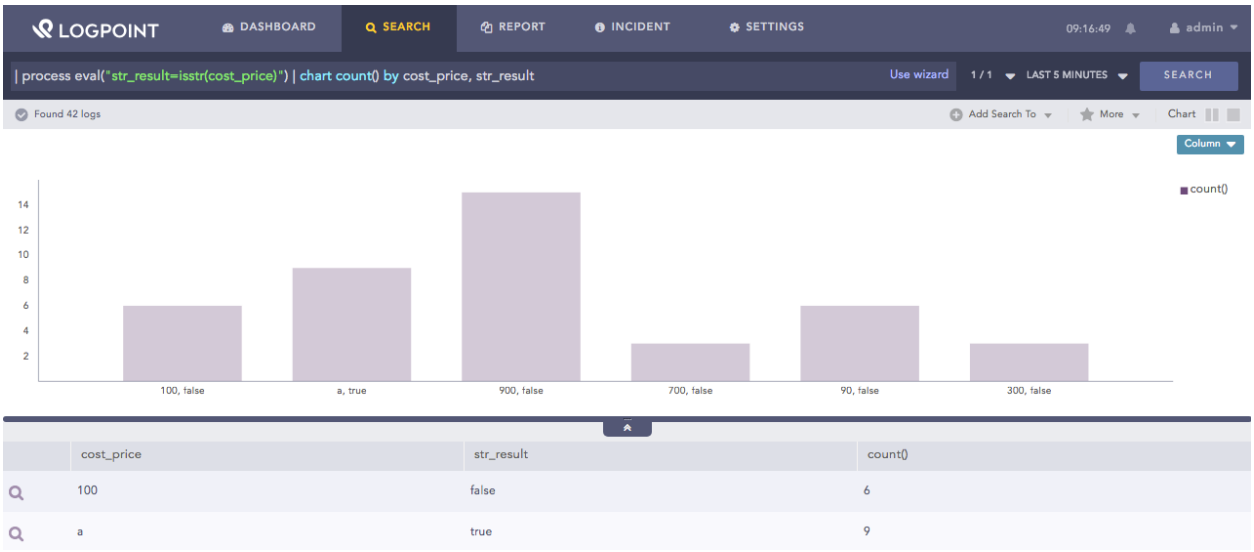


Fig. 6: Isstr function

15.7 typeof

This function accepts one argument *X* as input and returns the field type of the value of *X*, such as integer, double, string and boolean.

Syntax:

```
| process eval("identifier=typeof(X)")
```

Example:

```
| process eval("event_type=typeof(event_id)") | fields event_id, event_type
```

The above example returns the field type of the *event_id* value in the *event_type* identifier.

The *fields* command displays the value of *event_id* and *event_type* in a tabular form.

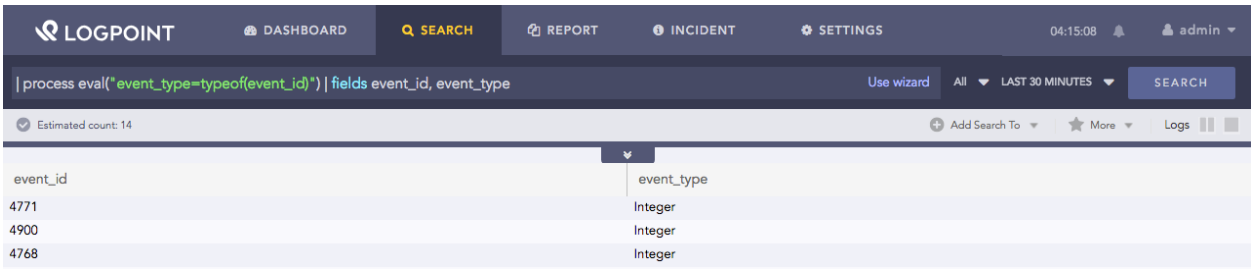


Fig. 7: Typeof function

15.8 issubstr

This function accepts two arguments *X* and *Y* as input and returns *True* if *X* is a substring of *Y*. If *X* is not a substring, the function returns *False*.

Syntax:

```
| process eval("identifier=issubstr(X, Y)")
```

Example:

```
| process eval("exists=issubstr('mal.exe','hi.exmal.exe,ok.dm') ")
```

The above example returns *true* in the *exists* identifier if *mal.exe* is substring of *hi.exmal.exe,ok.dm* string. If *mal.exe* is not a substring, the function returns *False*.

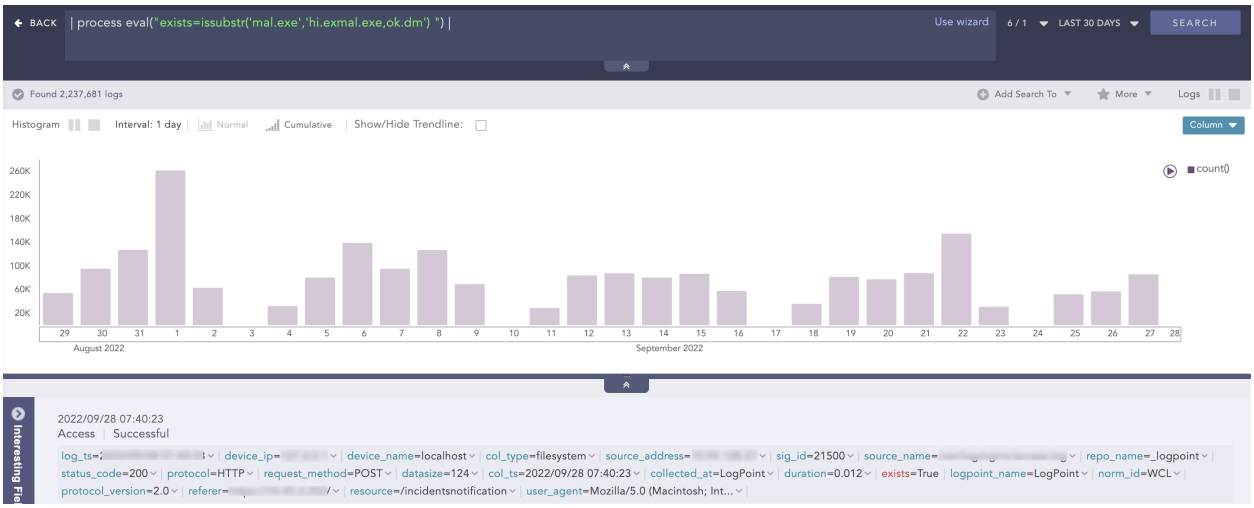


Fig. 8: Issubstr function

CHAPTER

SIXTEEN

UNINSTALLING THE EVALUATION PROCESS PLUGIN

1. Go to *Settings >> System Settings >> Applications*.
2. Click the **Uninstall** (—) icon from **Actions**.
3. Click **Submit**.

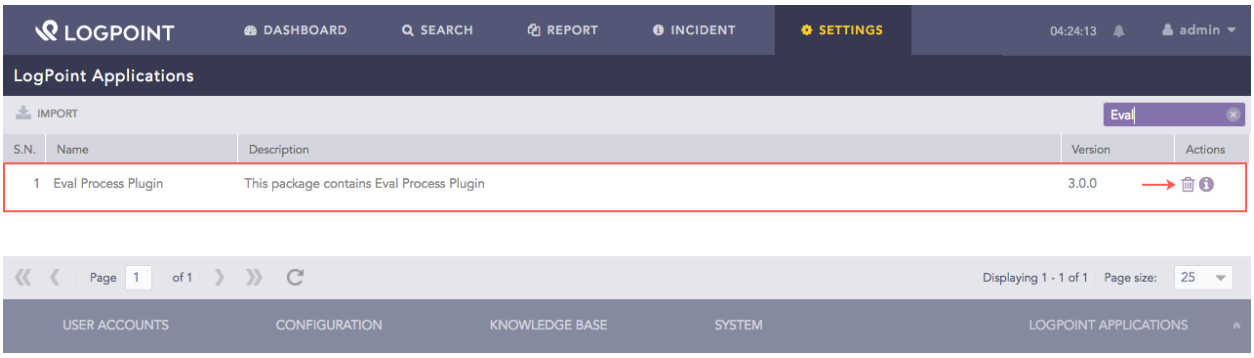


Fig. 1: Evaluation Process Plugin Uninstallation