

## Date &amp; Time - Category for date and time manipulation functions

| Name ▲      | Description   | Return Type                                | Parameters         |  |                   |         |
|-------------|---|--|--------------------|--|-------------------|---------|
|             |   |  | Name               | Description                                    | Type              | Requir. |
| DATE        | Creates a date object using the specified information on day, month and year.   | java.util.Date                             | Year               | The year of the new date                       | java.lang.Integer | Y       |
|             |   |  | Month              | The month of the new date                      | java.lang.Integer | Y       |
|             |   |  | Day of month       | The day of the new date                        | java.lang.Integer | Y       |
| DATEFORMAT  | Format the specified date object using the chosen format pattern.   | java.lang.String                           | Selected date      | The date to format                             | java.util.Date    | Y       |
|             |   |  | Format pattern     | Format pattern to apply when printing the date | java.lang.String  | Y       |
| DATERANGE   | Allows to create a JasperReports DateRange instance starting from either a String expression or a Date instance.                        | net.sf.jasperreports.types.d ate.DateRange | Date range details | The date range information                     | java.lang.Object  | Y       |
| DATEVALUE   | Gives the corresponding numeric value (long milliseconds) for a specified date object.  | java.lang.Long                             | Date object        | The object representing the date               | java.lang.Object  | Y       |
| DAY         | Returns the day of a given date. Date object can be a String, long value (milliseconds) or Date instance itself.                        | java.lang.Integer                          | Selected date      | The object representing the date               | java.lang.Object  | Y       |
| DAYS        | Returns the number of days between two dates.   | java.lang.Integer                          | Start date         | The initial date                               | java.lang.Object  | Y       |
|             |   |  | End date           | The end date                                   | java.lang.Object  | Y       |
| DAYSINMONTH | Returns the number of days in a month.  | java.lang.Integer                          | Selected date      | The date to check                              | java.lang.Object  | Y       |
| DAYSINYEAR  | Returns the number of days in a year.   | java.lang.Integer                          | Selected date      | The date to check                              | java.lang.Object  | Y       |
| EDATE       | Returns a date a number of months away.   | java.util.Date                             | Selected date      | The object representing the date               | java.lang.Object  | Y       |
|             |   |  | Months             | The number of months after the given date      | java.lang.Integer | Y       |
| HOURL       | Returns the hour (0-23) of the day for a given date. Date object can be a String, long value (milliseconds) or Date instance itself.    | java.lang.Integer                          | Selected date      | The object representing the date               | java.lang.Object  | Y       |
| ISLEAPYEAR  | Checks if the given date occurs in a leap year.   | java.lang.Boolean                          | Selected date      | The date to check                              | java.lang.Object  | Y       |
| MINUTE      | Returns the minute (0-59) of the hour for a given date. Date object can be a String, long value (milliseconds) or Date instance itself. | java.lang.Integer                          | Selected date      | The object representing the date               | java.lang.Object  | Y       |
| MONTH       | Returns the month of a given date. Date object can be a String, long value (milliseconds) or Date instance itself.                      | java.lang.Integer                          | Selected date      | The object representing the date               | java.lang.Object  | Y       |

| Name ▲      | Description   | Return Type       | Parameters          |  |                   |         |
|-------------|---|-------------------|---------------------|--|-------------------|---------|
|             |   |                   | Name                | Description  | Type              | Requir. |
| MONTHS      | Returns the number of months between two dates.   | java.lang.Integer | Start date          | The initial date   | java.lang.Object  | Y       |
|             |   |                   | End date            | The end date   | java.lang.Object  | Y       |
| NETWORKDAYS | Returns the number of working days between two dates (inclusive). Saturday and Sunday are not considered working days.                        | java.lang.Integer | Start date          | The initial date   | java.lang.Object  | Y       |
|             |   |                   | End date            | The end date   | java.lang.Object  | Y       |
| NOW         | Returns the current instant as date object  | java.util.Date    |                     |  |                   |         |
| SECOND      | Returns the second (0-59) of the minute for a given date. Date object can be a String, long value (milliseconds) or Date instance itself.     | java.lang.Integer | Selected date       | The object representing the date   | java.lang.Object  | Y       |
| TIME        | Returns a text string representing a time value (hours, seconds and minutes). If no specific pattern is provided a default formatter is used. | java.lang.String  | Hours               | The hours for the new time value   | java.lang.Integer | Y       |
|             |   |                   | Minutes             | The minutes for the new time value   | java.lang.Integer | Y       |
|             |   |                   | Seconds             | The seconds for the new time value   | java.lang.Integer | Y       |
|             |   |                   | Format pattern      | The pattern to format the time value   | java.lang.String  |         |
| TODAY       | Returns the current date as date object   | java.util.Date    |                     |  |                   |         |
| WEEKDAY     | Returns the day of the week for a given date. Date object can be a String, long value (milliseconds) or Date instance itself.                 | java.lang.Integer | Selected date       | The object representing the date   | java.lang.Object  | Y       |
|             |   |                   | Sunday is first day | Boolean flag to decide if Sunday should be considered as first day. Default is not | java.lang.Boolean |         |
| WEEKNUM     | Returns the week number of a given date.  | java.lang.Integer | Selected date       | The date to check  | java.lang.Object  | Y       |
| WEEKS       | Returns the number of weeks between two dates.  | java.lang.Integer | Start date          | The initial date   | java.lang.Object  | Y       |
|             |   |                   | End date            | The end date   | java.lang.Object  | Y       |
| WEEKSINYEAR | Returns the number of weeks in a year.  | java.lang.Integer | Selected date       | The date to check  | java.lang.Object  | Y       |
| WORKDAY     | Returns a date a number of workdays away. Saturday and Sundays are not considered working days.   | java.util.Date    | Selected date       | The object representing the date   | java.lang.Object  | Y       |
|             |   |                   | Working days        | The number of days after the given date  | java.lang.Integer | Y       |
| YEAR        | Returns the year of a given date. Date object can be a String, long value (milliseconds) or Date instance itself.                             | java.lang.Integer | Selected date       | The object representing the date   | java.lang.Object  | Y       |
| YEARS       | Returns the number of years between two dates.  | java.lang.Integer | Start date          | The initial date   | java.lang.Object  | Y       |
|             |   |                   | End date            | The end date   | java.lang.Object  | Y       |

| Name ▲ | Description   | Return Type       | Parameters      |   |                      |         |
|--------|---|-------------------|-----------------|---|----------------------|---------|
|        |   |                   | Name            | Description                               | Type                 | Requir. |
| AND    | Returns true if all arguments are considered true, false otherwise.       | java.lang.Boolean | Argument        | A boolean expression or value             | [Ljava.lang.Boolean; | Y       |
| EQUALS | Checks if the two specified objects are equal.                            | java.lang.Boolean | Object 1        | The first element to be compared          | java.lang.Object     | Y       |
|        |   |                   | Object 2        | The second element to be compared         | java.lang.Object     | Y       |
| FALSE  | Returns the logical value FALSE.  | java.lang.Boolean |                 |   |                      |         |
| IF     | Returns one of two values, depending on a test condition.                 | java.lang.Object  | Test condition  | An expression returning a boolean value   | java.lang.Boolean    | Y       |
|        |   |                   | Value 1 (true)  | The value returned when the test is true  | java.lang.Object     | Y       |
|        |   |                   | Value 2 (false) | The value returned when the test is false | java.lang.Object     | Y       |
| NOT    | Returns the negation of the specified boolean expression.                 | java.lang.Boolean | Argument        | A boolean expression or value             | java.lang.Boolean    | Y       |
| OR     | Returns true if any of the arguments is considered true, false otherwise. | java.lang.Boolean | Argument        | A boolean expression or value             | [Ljava.lang.Boolean; | Y       |
| TRUE   | Returns the logical value TRUE.   | java.lang.Boolean |                 |   |                      |         |

**Numeric / Mathematical - Category for mathematical operations functions**

| Name ▲      | Description   | Return Type       | Parameters      |                                     |                     |         |
|-------------|---|-------------------|-----------------|-------------------------------------|---------------------|---------|
|             |   |                   | Name            | Description                         | Type                | Requir. |
| ABS         | Returns the absolute value of a number.   | java.lang.Number  | Number          | The number to check                 | java.lang.Number    | Y       |
| CEIL        | Returns the smallest value that is greater than or equal to the argument and is equal to a mathematical integer.  | java.lang.Double  | Number          | Value                               | java.lang.Number    | Y       |
| FACT        | Returns the factorial of a number.  | java.lang.Long    | Integer number  | The argument                        | java.lang.Integer   | Y       |
| FLOOR       | Returns the largest value that is less than or equal to the argument and is equal to a mathematical integer.      | java.lang.Double  | Number          | Value                               | java.lang.Number    | Y       |
| ISEVEN      | Checks if a number is even. If a non-integer number is specified, any digits after the decimal point are ignored. | java.lang.Boolean | Number          | The number to check                 | java.lang.Number    | Y       |
| ISODD       | Checks if a number is odd. If a non-integer number is specified, any digits after the decimal point are ignored.  | java.lang.Boolean | Number          | The number to check                 | java.lang.Number    | Y       |
| MAX         | Returns the maximum of a list of numeric values.  | java.lang.Number  | Number          | Number to compare                   | [Ljava.lang.Number; | Y       |
| MIN         | Returns the minimum of a list of numeric values.  | java.lang.Number  | Number          | Number to compare                   | [Ljava.lang.Number; | Y       |
| PRODUCT     | Returns the product of a list of numbers.   | java.lang.Number  | Number          | Argument                            | [Ljava.lang.Number; | Y       |
| RAND        | Returns a random number between 0.0 and 1.0.  | java.lang.Double  |                 |                                     |                     |         |
| RANDBETWEEN | Returns an Integer random number between bottom and top range (both inclusive).                                   | java.lang.Integer | Bottom range    | Integer number for the bottom range | java.lang.Integer   | Y       |
|             |   |                   | Top range       | Integer number for the top range    | java.lang.Integer   | Y       |
| SIGN        | Returns the sign of a number.   | java.lang.Integer | Number          | The number to check                 | java.lang.Number    | Y       |
| SQRT        | Returns the positive square root of a number. The number must be positive.  | java.lang.Number  | Positive number | Argument                            | java.lang.Number    | Y       |
| SUM         | Returns the sum of a list of numbers.   | java.lang.Number  | Number          | Addendum                            | [Ljava.lang.Number; | Y       |

## Text - Category for text/string manipulation functions

| Name ▲        | Description   | Return Type       | Parameters       |   |                     |         |
|---------------|---|-------------------|------------------|---|---------------------|---------|
|               |   |                   | Name             | Description   | Type                | Requir. |
| BASE          | Returns a text representation of a number, in a specified base radix.   | java.lang.String  | Number           | The positive integer number to convert                                    | java.lang.Integer   | Y       |
|               |   |                   | Radix            | The base radix, an integer between 2 and 36                               | java.lang.Integer   | Y       |
|               |   |                   | Minimum length   |   | java.lang.Integer   |         |
| CHAR          | Returns a single text character, given a character code.  | java.lang.String  | Char code        | The character code, in the range 1-255                                    | java.lang.Integer   | Y       |
| CLEAN         | Returns a new text string without non-printable characters.   | java.lang.String  | Text             | The text to be cleaned  | java.lang.String    | Y       |
| CODE          | Returns the numeric code (0-255) for the first character in a string.   | java.lang.Integer | Text             | The string containing the character to convert                            | java.lang.String    | Y       |
| CONCATENATE   | Combines a list of strings into a single one.   | java.lang.String  | Text             | Argument  | [Ljava.lang.String; | Y       |
| DOUBLE_VALUE  | Returns a Double number representing the given text string.   | java.lang.Double  | Number (as text) | The input text string representing a number                               | java.lang.String    | Y       |
| EXACT         | Returns TRUE if the two text specified are exactly the same (case sensitive compare).                         | java.lang.Boolean | Text 1           | The first text to compare   | java.lang.String    | Y       |
|               |   |                   | Text 2           | The second text to compare  | java.lang.String    | Y       |
| FIND          | Returns the character position of a string inside another text. If the text is not found then -1 is returned. | java.lang.Integer | Find text        | The text to look into   | java.lang.String    | Y       |
|               |   |                   | Text to search   | The text string to search   | java.lang.String    | Y       |
|               |   |                   | Start position   | The position from which the search should start                           | java.lang.Integer   |         |
| FIXED         | Returns the text representing number with the specified decimal places.                                       | java.lang.String  | Number           | The number to print out   | java.lang.Number    | Y       |
|               |   |                   | Decimals         | The number of decimal places  | java.lang.Integer   | Y       |
|               |   |                   | Omit separators  | The flag to specify if the thousands separators should be included or not | java.lang.Boolean   |         |
| FLOAT_VALUE   | Returns a Float number representing the given text string.  | java.lang.Float   | Number (as text) | The input text string representing a number                               | java.lang.String    | Y       |
| INTEGER_VALUE | Returns an Integer number representing the given text string.   | java.lang.Integer | Number (as text) | The input text string representing a number                               | java.lang.String    | Y       |
| LEFT          | Returns the specified number of characters (1 by default) from the left side of the input text.               | java.lang.String  | Text             | The input text  | java.lang.String    | Y       |
|               |   |                   | Characters num   | The number of characters. Default (not specified) is 1                    | java.lang.Integer   |         |
| LEN           | Returns the length of the specified text string.  | java.lang.Integer | Text             | The input text string   | java.lang.String    | Y       |
| LONG_VALUE    | Returns a Long number representing the given text string.   | java.lang.Long    | Number (as text) | The input text string representing a number                               | java.lang.String    | Y       |

## Text - Category for text/string manipulation functions

| Name ▲     | Description  | Return Type       | Parameters       |  |                   |         |
|------------|--|-------------------|------------------|--|-------------------|---------|
|            |  |                   | Name             | Description  | Type              | Requir. |
| LOWER      | Performs the lower case conversion of the specified text string.   | java.lang.String  | Text             | The input text string                                  | java.lang.String  | Y       |
| LTRIM      | Clear a string, removing leading whitespaces.  | java.lang.String  | Text             | The text string to be trimmed                          | java.lang.String  | Y       |
| MID        | Returns the text from the middle of a text string.   | java.lang.String  | Text             | The input text   | java.lang.String  | Y       |
|            |  |                   | Start            | The initial position to extract the text               | java.lang.Integer | Y       |
|            |  |                   | Characters num   | The number of characters                               | java.lang.Integer |         |
| PROPER     | Capitalizes each words of the specified text. The remaining parts of words are in lowercase.   | java.lang.String  | Text             | The input text   | java.lang.String  | Y       |
| REPLACE    | Replaces parts of a text string with a different one. Starting from a specified position, removes a certain number of characters and then insert the new text. | java.lang.String  | Original Text    | The input text to modify                               | java.lang.String  | Y       |
|            |  |                   | Start position   | The number of characters. Default (not specified) is 1 | java.lang.Integer | Y       |
|            |  |                   | Characters num   | The number of characters to remove                     | java.lang.Integer | Y       |
|            |  |                   | New Text         | The text that will replace the old one                 | java.lang.String  | Y       |
| REPT       | Replicates an input text string for a specified number of times.   | java.lang.String  | Original Text    | The input text to replicate                            | java.lang.String  | Y       |
|            |  |                   | Number of copies | The needed number of copies                            | java.lang.Integer | Y       |
| RIGHT      | Returns the specified number of characters (1 by default) from the right side of the input text.   | java.lang.String  | Text             | The input text   | java.lang.String  | Y       |
|            |  |                   | Characters num   | The number of characters. Default (not specified) is 1 | java.lang.Integer |         |
| RTRIM      | Clear a string, removing trailing whitespaces.   | java.lang.String  | Text             | The text string to be trimmed                          | java.lang.String  | Y       |
| SEARCH     | Returns the position of a string of text in another string. Search is not case-sensitive.  | java.lang.Integer | Find Text        | The text to find                                       | java.lang.String  | Y       |
|            |  |                   | Text to search   | The text to look into                                  | java.lang.String  | Y       |
|            |  |                   | Start position   | The initial position                                   | java.lang.Integer |         |
| SUBSTITUTE | Substitutes new text for old text in a text string. When no occurrence is specified all occurrences are replaced.  | java.lang.String  | Original Text    | The text to be modified                                | java.lang.String  | Y       |
|            |  |                   | Old Text         | The old text to be replaced                            | java.lang.String  | Y       |
|            |  |                   | New Text         | The new text that will replace the old one             | java.lang.String  | Y       |
|            |  |                   | Occurrence       | The occurrence of old text to be replaced              | java.lang.Integer |         |
| T          | Returns the text string if the value is a string, otherwise an empty string is returned.   | java.lang.String  | Generic value    | The object value to be tested                          | java.lang.Object  | Y       |

Text - Category for text/string manipulation functions

| Name ▲ | Description   | Return Type      | Parameters |                               |                  |         |
|--------|---|------------------|------------|-------------------------------|------------------|---------|
|        |   |                  | Name       | Description                   | Type             | Requir. |
| TEXT   | Converts a number into a text string according to a specified format. | java.lang.String | Number     | The number to be formatted    | java.lang.Number | Y       |
|        |   |                  | Format     | The format pattern            | java.lang.String | Y       |
| TRIM   | Clear a string,removing leading and trailing whitespaces.             | java.lang.String | Text       | The text string to be trimmed | java.lang.String | Y       |
| UPPER  | Performs the upper case conversion of the specified text string.      | java.lang.String | Text       | The input text string         | java.lang.String | Y       |

Functions Examples

| Numeric / Mathematical Functions   | Expression                        | Result     |
|------------------------------------|-----------------------------------|------------|
| -245   is even                     | ISEVEN(ABS(-245))                 | false      |
| 14.4 * 22.56 * 10 * 34             | PRODUCT(14.4, 22.56, 10, 34)      | 110.453,76 |
| Random number between 0 and 1000   | 1000 * RAND()                     | 362,89     |
| Factorial of 5                     | FACT(5)                           | 120        |
| SQRT(6.25)                         | SQRT(6.25)                        | 2,50       |
| Max value in [4,6,2,3,9,4,1,7,3,8] | MAX(4, 6, 2, 3, 9, 4, 1, 7, 3, 8) | 9          |

| Date & Time Functions | Expression                                      | Result             |
|-----------------------|---|--------------------|
| Current date          | DATEFORMAT(NOW(), "EEEE, MMM d, yyyy")          | moni, Nov 25, 2014 |
| Current year          | YEAR(TODAY())                                   | 2014               |
| Four months later     | DATEFORMAT(EDATE(TODAY(), 4), "MM/dd/yyyy")     | 03/25/2015         |
| Five years ago        | DATEFORMAT(EDATE(TODAY(), -60), "MMMM d, yyyy") | noiembrie 25, 2009 |
| Current week number   | WEEKNUM(TODAY())                                | 48                 |
| Next working day      | DATEFORMAT(WORKDAY(TODAY(),1), "EEE, MMM dd")   | Mi, Nov 26         |
| Years since 2000      | YEARS(DATE(2000, 1, 1), NOW())                  | 14                 |
| Current time          | DATEFORMAT(TODAY(), "hh:mm:ss a")               | 10:39:08 AM        |

| Text Functions                            | Expression                                       | Result               |
|---|--|----------------------|
| Concatenate "Hello", " ", "World"         | CONCATENATE("Hello", " ", "World")               | Hello World          |
| Case sensitive search for "ll" in "Hello" | "Found on position " + (FIND("Hello", "ll") + 1) | Found on position 3  |
| Case insensitive search for "LL" in "all" | "Found on position " + (SEARCH("LL", "all") + 1) | Found on position 2  |
| Lower case for "Hello WORLD"              | LOWER("Hello WORLD")                             | hello world          |
| Capitalize each word                      | PROPER("Capitalize each word")                   | Capitalize Each Word |
| Replicates "Hello " three times           | REPT("Hello ", 3)                                | Hello Hello Hello    |
| Substitute "o" by "0" in "Hello World"    | SUBSTITUTE("Hello World", "o", "0")              | Hel0 W0rld           |
| Extract "orl" from "Hello World"          | MID("Hello World", 8, 3)                         | orl                  |



| Logical Functions            | Expression                          | Result |
|------------------------------|-------------------------------------|--------|
| This is true.                | TRUE()                              | true   |
| This is false.               | FALSE()                             | false  |
| 3 < 5 AND 3 > 7              | AND(3 < 5, 3 > 7)                   | false  |
| 3 < 5 OR 3 > 7               | OR(3 < 5, 3 > 7)                    | true   |
| Current month is before July | IF(MONTH(TODAY()) < 7, "YES", "NO") | NO     |