flexible search™

Display Template Reference Manual

(Click on a link to access the desired section)

Version 2.0

SLICCWARE™

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SLICCWARE™

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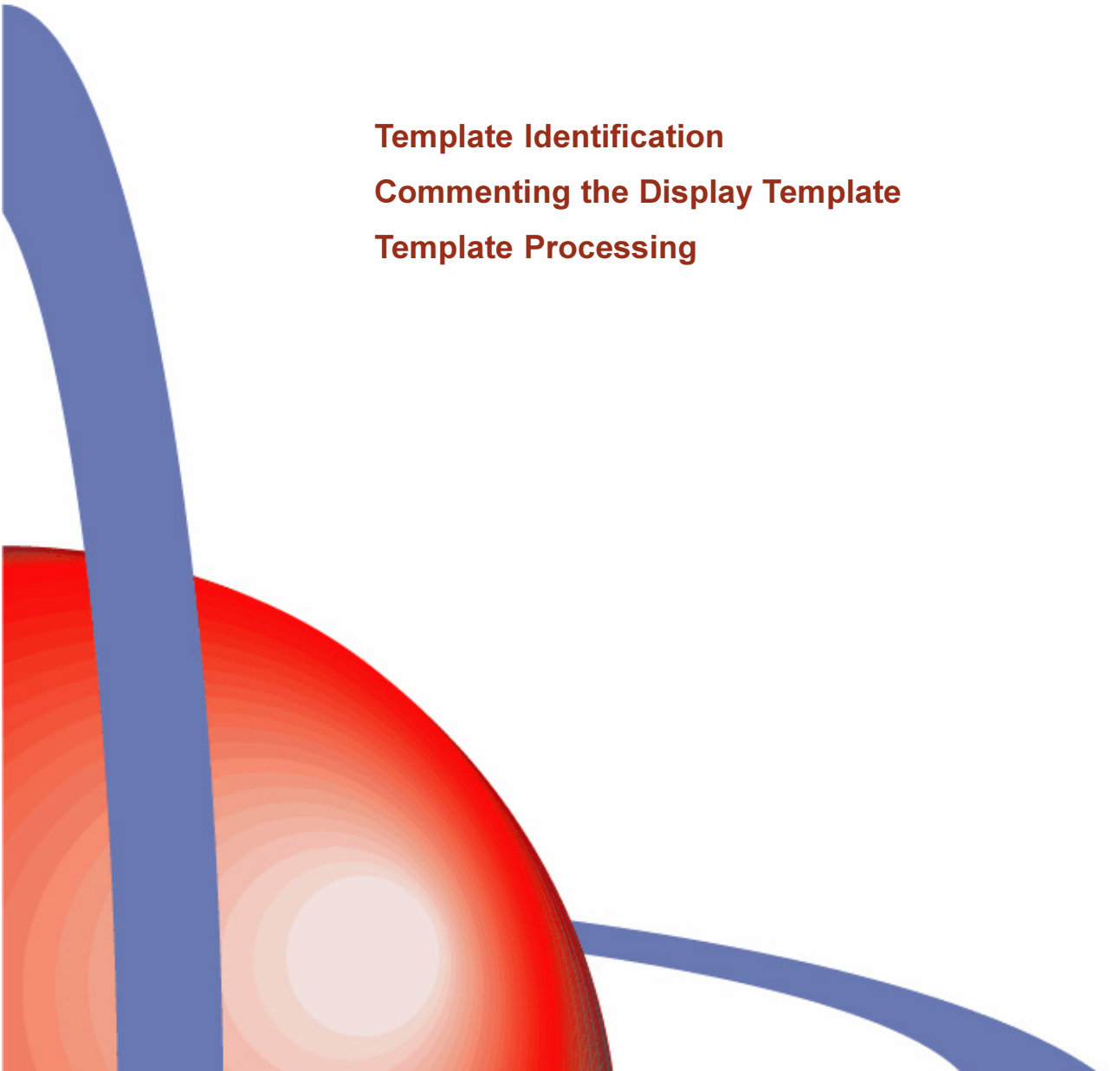


Template Identification

Commenting the Display Template

Template Processing

Section 1.1 – Template Identification

A *Display Template* is used to format the results returned from an information retrieval request. The display template can contain anything, and can be used to format the results in any format. The most common uses are to format the results as either XML for further processing within a complex system or as HTML for display by a browser. However, the results may be formated as simple text or in any other way.

In processing the template, each character is output exactly as it appears within the template until a grave accent is encountered. A grave accent is the lower case character found in the upper left corner of the keyboard to the left of the one and exclamation point key, directly above the tab key. Grave accents are used to encapsulate control statements, expressions, variables, system values, and data field names that are to be processed by the template processing software.

When a grave accent is encountered special processing takes over. Once special processing has completed, normal processing continues at the new location, outputing each character exactly as it appears within the template until the next grave accent is encountered.

One of the functions supported by special processing is the setting of system variables. At the top of the *Display Template*, a series of system values must be set. That is the only time throughout the entire *Display Template* that any values are set. Four system values must be set:

__TYPE	must be set to *DISPLAY*;
__NAME	is the name to be assigned to the template
__RESOURCE	is the resource ID to be assigned to the display template
__LOAD_ID	is the ID assigned to the load from which results are to be extracted

Another system value, *__LOADDEF*, is optional and is set to the path to the *Load Definition File* used as a source of field names in generating the *Display Template*.

FORMAT

```
`__TYPE=DISPLAY`
`__NAME=name`
`__RESOURCE=rsrc`
`__LOAD_ID=load`
```

Where: **name** is the name assigned to the display template
rsrc is the ID assigned to the display template
load is the ID assigned to the load definition file referenced by the display template

EXAMPLES

Create a Display Template named BasicSearch with a resource ID of 803, used to display data stored within the search load with ID 2.

```
<!-- ##  Set system values defining template ## -->
`__TYPE=DISPLAY`
`__NAME=BasicSearch`
`__RESOURCE=803`
`__LOAD_ID=2`
<!-- ##  Begin display template code ## -->
<html>
<head>
    <title>Basic Search Template</title>
</head>
```

• • •

Section 1.2 – Commenting the Display Template

To make it easier to document the *Display Templates, Flexible Search Template Processing* supports comments which are stripped from the *Display Template* at the time of compilation. A DisplayTemplate comment is a modified HTML comment with a pair of pound sign before the comment string and a pair of pound signs after the comment string.

The comment begins with a less-than bracket, followed by an exclamation point, followed by a pair of dashes, followed by a blank, followed by a pair of pound signs, followed by the comment string, followed by a pair of pound signs, followed by a blank, followed by a pair of dashes, followed by a greater-than bracket.

FORMAT

<!-- ## string ## -->

Where: **string** is the comment to be placed into the display template

EXAMPLES

```
<!-- ## Set system values defining template ## -->
`__TYPE=DISPLAY`
`__NAME=BasicSearch`
`__RESOURCE=803`
`__LOAD_ID=2`
<!-- ## Begin display template code ## -->
<html>
<head>
    <title>Basic Search Template</title>
</head>
```

• • •

Flexible Search Template Processing supports displaying record data by encapsulating the field name within a pair of grave accents. String and text data is displayed exactly as loaded into the system. Numeric data is displayed as unsigned integers. To display date or time data, geo-spatial coordinates or numeric data in some other format, such as currency, a format statement is used. A number of formats are supported. For more information see Section 7.

Flexible Search Template Processing also supports displaying variables passed in from an HTML form or set within the *Logic Template*, as well as a large selection of system values. Variables are displayed exactly as entered into the system. To alter the format use a format statement.

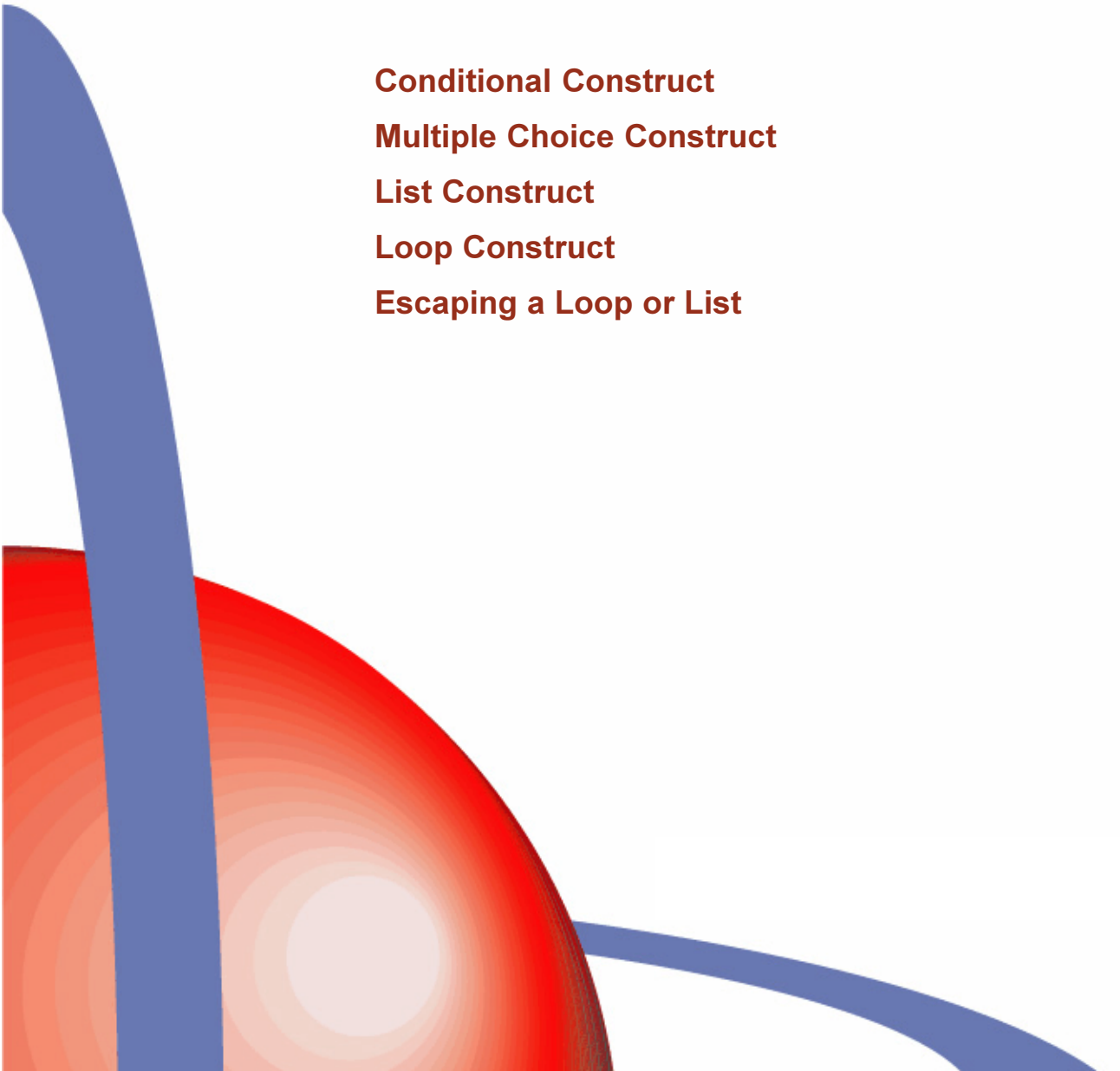
Expressions involving record data as well as variables are supported by *Flexible Search Template Processing*. Expressions can include multiple levels of parenthesis and any of a number of supported operators. An expressions is displayed as an unsigned integer. To display an expression in some other format use a format statement. For more information on expressions see Section .

A number of functions are supported by *Flexible Search Template Processing* for direct display or for use in expressions.

Flexible Search Template Processing also supports a number of statements for use in controling the processing of the display template. Among these are: the *IF .. ENDIF Conditional Construct*, the *IF .. ELSE .. ENDIF Multiple Choice Construct*, the *LIST .. REPEAT Display List Construct*, the *LOOP .. REPEAT Category Looping Construct*, and the *BREAK* statement used to exit list and looping constructs early.

EXAMPLES

Section 2 – Processing Control



Conditional Construct

Multiple Choice Construct

List Construct

Loop Construct

Escaping a Loop or List

Section 2.1 – Conditional Construct

Conditional Constructs are used to control logic flow and support conditional processing in the Display Template. A *Conditional Construct* consists of an *IF (x)* statement enclosed within a pair of grave accents (where *x* is an expression to be evaluated), followed by one or more items that are to be processed if the expression evaluates to anything other than zero, and an *ENDIF* statement, also enclosed within a pair of grave accents.

When the *IF (x)* statement is encountered, the expression *x* is evaluated as a numeric expression. If the expression evaluates to zero, everything after the *IF (x)* statement up to the matching *ENDIF* statement is ignored. If the expression evaluates to anything other than zero, everything after the *IF (x)* statement up to the matching *ENDIF* statement is processed. When the matching *ENDIF* statement is encountered, processing continues as it had before the *IF (x)* statement was encountered.

Multiple levels of nested parenthesis are supported within the numerical expression *x*. Within each pair of parenthesis can be any number of operands connected by any of the operators described in section 5. Evaluation of the numerical expression *x* proceeds from the inner-most level of parenthesis outward, and then from left to right within each level. There is no precedence assigned to the operators.

Conditional Constructs may be nested to any level and may be contained within and contain any other construct.

FORMAT

Conditional processing within a Display Template is accomplished by bracketing the section which is to be processed only when a certain condition is met by a *Conditional Construct*.

`IF ( exp )`

html

`ENDIF`

Where: **exp** is the expression to be evaluated
html is the section of HTML to be processed only if **exp** evaluates to anything other than zero.

EXAMPLES

Use a Conditional Construct to only display the address if all 3, address, city and state are present.

```
<a href="`_Path`">`_Name`</a><br>
`IF ( Address && City && State )`
    `Address` <br>
    `City`, `State` `ZipCode` <br>
`ENDIF`
<br>
```

Section 2.2 – Multiple Choice Construct

Multiple Choice Constructs are used to control logic flow and support conditional processing in the Display Template. An *Multiple Choice Construct* consists of an *IF (x)* statement, enclosed within a pair of grave accents, (where *x* is an expression to be evaluated), followed by one or more items that are to be processed if the expression evaluates to anything other than zero, followed by an *ELSE* statement, also enclosed within a pair of grave accents, followed by one or more items that are to be processed if the expression evaluates to zero, and an *ENDIF* statement, enclosed within a pair of grave accents as well.

When an *IF (x)* statement is encountered, the expression following it is evaluated as a numeric expression. If the expression evaluates to zero, everything after the expression up to the matching *ELSE* statement is ignored. Everything between the *ELSE* and *ENDIF* statements is processed. If the expression evaluates to anything other than zero, everything after the expression up to the matching *ELSE* statement is processed. Everything between the *ELSE* and *ENDIF* statements is ignored. When the matching *ENDIF* statement is encountered, processing continues as it had before the *IF (x)* statement was encountered.

Multiple levels of nested parenthesis are supported within the numerical expression *x*. Within each pair of parenthesis can be any number of operands connected by any of the operators described in section 5. Evaluation of the numerical expression *x* proceeds from the inner-most level of parenthesis outward, and then from left to right within each level. There is no precedence assigned to the operators.

Multiple Choice Constructs may be nested to any level and amy be contained within and contain other constructs.

FORMAT

Command level alternative processing is done by bracketing the lines to be processed conditionally and the alternative lines by an *Multiple Choice Construct*.

`IF ( exp )`

htmA

`ELSE`

htmB

`ENDIF`

Where: **exp** is the expression to be evaluated
htmA is the section of HTML to be processed only if **exp** evaluates to anything other than zero.
htmB is the section of HTML to be processed only if **exp** evaluates to zero.

EXAMPLES

Use a Multiple Choice Construct to determine the format of an HTML display based upon the number of results returned.

```
`IF (  __COUNT  )`
    Displaying `__FIRST` through `__LAST`
    of `__COUNT` Items found<BR>
`ELSE`
    No Items found<BR>
`ENDIF`
```

Section 2.3 – List Construct

The *List Construct* is used to loop through a result set, one record at a time. Multiple *List Constructs* may be used within a *Display Template*. However, one *List Construct* may not be nested within another *List Construct*.

A *List Construct* consists of a *LIST* statement enclosed within a pair of grave accents, a *REPEAT* statement enclosed within a pair of grave accents, and a section of display code between the two statements that are to be processed for each item in the result list.

When *a LIST* statement is encountered, the record pointer is reset to the first record in the result list, *__ORDINAL*, a system value, is reset to 1, and the system value *__ODD,* is set to 1 as well. Processing continues with each subsequent line, using the first record in the display list as the data source for any data field requests, until the first time a *REPEAT* statement is encountered.

At that point, the system value *__ORDINAL,* is incremented by one, the system value *__ODD,* is toggled by subtracting the current value from 1.

If the system value *__ORDINAL* is not greater than the system value *__COUNT*, the process starts over again with the new values, beginning with the first byte after the *LIST* statement.

If the system value *__ORDINAL* is greater than the system value *__COUNT*, the *Listing Construct* is exited, and processing continues with the first byte after the *REPEAT* statement.

FORMAT

To process a section of display code for each record within the display list, bracket that section of code with a *List Construct*.

`LIST`

html

` REPEAT`

Where: **html** is the section of display code to be processed for each item returned within the display list.

EXAMPLES

Use a List Construct to display results from a news article search.

```
<table>
`LIST`
    <tr><td width=”500”>
    <a href=`_Path` >`_Title`</a></td>
    <td width=”100”>`_Date`</td></tr>
    <tr><td width=”500”>`_Description`</td>
    <td width=”100”>`_Source`</td></tr>
`REPEAT`
</table>
```

Use a List Construct within a Looping Construct to display results from a news article search, organized by news sources.

```
<table><tr><td width="600" colspan="2">
`LOOP`
    <a href=”`__SERVER`?`__LOGIC`=`__Simple`&amp;amp;\
        Key=HTTPEncode( URLEncode( Key ) )`\
        &amp;amp;Source=`__CATEGORY`”>
    `__CATEGORY_SIZE` articles in`__CATEGORY`
    </a></td></tr><tr><td width=”25”> </td>
    <td width=575><table>
    `LIST`
        <tr><td width=”475”>
            <a href=`_Path` >`_Title`</a></td>
            <td align=”right” width=”100”>
            `_Date`</td></tr>
        <tr><td colspan=2>`_Description`</td></tr>
    `REPEAT`
    </td></tr><tr><td>
    <img src="spacer.gif" width="475" height="1"></td>
    <td><img src="spacer.gif" width="100" height="1">
    </td></tr>
    </table></td></tr><tr><td>
    <img src="spacer.gif" width="25" height="1"></td>
    <td><img src="spacer.gif" width="575" height="1">
    </td></tr>
`REPEAT`
</table>
```

Section 2.4 – Loop Construct

The *Loop Construct* is used to loop through a list generated by either a *Return Count* or *Return Results* command (see the Logic Template Reference Manual.) for the purpose of displaying the results found by category. Multiple *Loop Constructs* may be used within a *Display Template*. However, one *Loop Construct* may not be nested within another *Loop Construct*.

A *Loop Construct* consists of a *Loop* statement enclosed within a pair of grave accents, a *REPEAT* statement enclosed within a pair of grave accents, and a section of display code between the two statements that are to be processed for each item in the result list.

When accessing a list returned by a *Return Results* command, a *List Construct* is usually embedded within the *Loop Construct* to display the results returned for each category, numeric range, or time frame.

When *a LOOP* statement is encountered, the category pointer is reset to the first category, range or timeframe in the category list, the system value *__ORDINAL,* is reset to 1, and the system value *__ODD,* is set to 1 as well. Processing continues with each subsequent line, using the descriptor for the first item in the category list as the data source for any data field requests, until the matching *REPEAT* statement is encountered.

The descriptor for each category, numeric range or timeframe contains two fields. For each category, the first field is the category name, the second is the number of records matched within the category. For each numeric range, the first field is the lower limit of the numeric range, the second is the number of records matched within the numeric range. For each timeframe, the first is the earliest limit of the timeframe, the second is the number of records matched within the timeframe.

When the matching *REPEAT* statement is encountered, the system value *__ORDINAL,* is incremented by one, the system value *__ODD,* is toggled by subtracting the current value from 1.

If the system value *__ORDINAL* is not greater than the system value *__HISTOGRAM_COUNT*, the process starts over again with the new values, beginning with the first byte after the *LOOP* command.

If the system value *__ORDINAL* is greater than the system value *__HISTOGRAM_COUNT*, the *Loop Construct* is exited, and processing continues with the first byte after the matching *REPEAT* statement.

If a *List Construct* is nested within a *Loop Construct*, the system values, *__ORDINAL* and *__ODD,* associated with the *Loop Construct* are saved while the *List Construct* is processed, and restored after the *List Construct* completes.

FORMATS

To process a section of display code for each category, numeric range or timeframe within the list generated by a *Return Count* command, bracket that section of code with a *Loop Construct*.

`LOOP`

html

`REPEAT`

Where: **html** is the section of HTML to be processed for each category, numeric range or timeframe within the category list.

To process a section of display code for each category, numeric range or timeframe within the list generated by a *Return Results* command, bracket that section of code, including the *List Construct* used to display data from each result list, with a *Loop Construct.*

`LOOP`

• • •

`LIST`

html

`REPEAT`

• • •

`REPEAT`

Where: **html** is the section of HTML to be processed for each item within the display list, for each category, numeric range or timeframe within the category list.

Section 2.4 – Loop Construct (cont.)

EXAMPLES

Use a List Construct to display results from a news article search.

```
`__CATEGORY_TOTAL` categories found with matching
articles.<br><hr>
` LOOP`
    <a href="`_SERVER`?`_LOGIC`=`__Simple`&amp;\
          Key=`HTTPEncode( URLEncode( Key ) )`\
          &amp;Source=`__CATEGORY`">
    `__CATEGORY`</a><br>
          `__COUNT`
`REPEAT`
```

Use a List Construct within a Loop Construct to display results from a news article search, organized by news sources.

```
<table><tr><td width="600" colspan="2">
`LOOP`
    <a href="`_SERVER`?`_LOGIC`=`__Simple`&amp;\
        Key=`HTTPEncode( URLEncode( Key ) )`\
        &amp;Source=`__CATEGORY`">
    `__CATEGORY_SIZE` articles in `__CATEGORY`
    </a></td></tr><tr><td width="25"> </td>
    <td width=575><table>
    `LIST`
        <tr><td width="475">
            <a href=`_Path` >`_Title`</a></td>
            <td align="right" width="100">
            `_Date`</td></tr>
        <tr><td colspan=2>`_Description`</td></tr>
    `REPEAT`
    </td></tr><tr><td>
    <img src="spacer.gif" width="475" height="1"></td>
    <td><img src="spacer.gif" width="100" height="1">
    </td></tr>
    </table></td></tr><tr><td>
    <img src="spacer.gif" width="25" height="1"></td>
    <td><img src="spacer.gif" width="575" height="1">
    </td></tr>
`REPEAT`
</table>
```

The *BREAK* statement is used to exit a *Loop Construct* or *List Construct* prematurely.

When a *BREAK* statement is encountered, processing within the current *Loop Construct* or *List Construct* terminates, the system value *__EARLY_EXIT*, is set to the current value of the system value, *__ORDINAL*, which will always be greater than zero, and processing continues with the first byte after the first `*REPEAT*` statement encountered.

FORMATS

To exit a *List Construct* early when a certain condition is met, place a *BREAK* statement within a *Conditional Construct*, within the *List Construct*.

```
`LIST`
    • • •
    `IF ( exp )`
        `BREAK`
    `ENDIF`
    • • •
`REPEAT`
```

Where: **exp** is the condition which, when met, causes the display list processing to be terminated early.

To exit a *Loop Construct* early when a certain condition is met, place a *BREAK* statement within a *Conditional Construct*, within the *Loop Construct*.

```
`LOOP`
    • • •
    `IF ( exp )`
        `BREAK`
    `ENDIF`
    • • •
`REPEAT`
```

Where: **exp** is the condition which, when met, causes the display list processing to be terminated early.

To exit a *List Construct* within a *Loop Construct* early when a certain condition is met, and then exit the outer *Loop Construct*; place a *BREAK* statement within a *Conditional Construct*, within the *List Construct*, as well as a *Conditional Construct*, within the *Loop Construct*.

```
`LOOP`
    • • •
    `LIST`
        • • •
        `IF ( exp )`
            `BREAK`
        `ENDIF`
        • • •
    `REPEAT`
    • • •
    `IF ( `__EARLY_EXIT` )`
        `BREAK`
    `ENDIF`
    • • •
`REPEAT`
```

Where: **exp** is the condition which, when met, causes the display list processing to be terminated early.

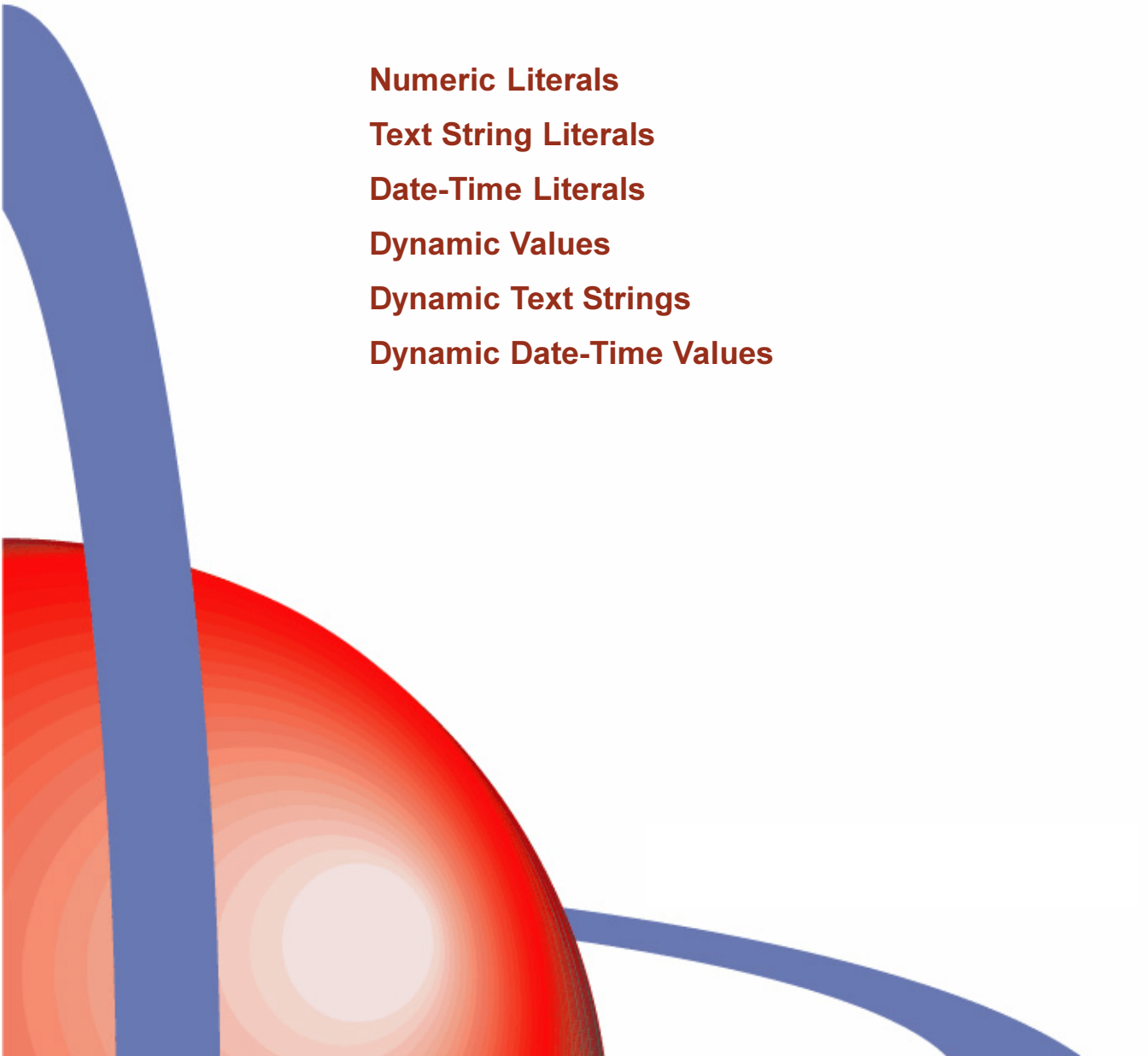
EXAMPLES

Use a BREAK Statement to exit a List Construct within a Loop Construct when an article entitled "Sports" is encountered, and then exit the Loop Construct..

```
<table><tr><td width="600" colspan="2">
`LOOP`
    <a href="`__SERVER`?`__LOGIC`=`__Simple`&amp;\
        Key=`HTTPEncode( URLEncode( Key ) )`\
        &amp;Source=`__CATEGORY`">
    `__CATEGORY_SIZE` articles in `__CATEGORY`
    </a></td></tr><tr><td width="25"> </td>
    <td width=575><table>
    `LIST`
        `IF ( ! _@STRCMP( "Sports", `_Title` ) )`
            `BREAK`
        `ENDIF`
        <tr><td width="475">
            <a href=`_Path` >`_Title`</a></td>
            <td align="right" width="100">
            `_Date`</td></tr>
        <tr><td colspan=2>`_Description`</td></tr>
    `REPEAT`
    </td></tr><tr><td>
    <img src="spacer.gif" width="475" height="1"></td>
    <td><img src="spacer.gif" width="100" height="1">
    </td></tr>
    </table></td></tr><tr><td>
    <img src="spacer.gif" width="25" height="1"></td>
    <td><img src="spacer.gif" width="575" height="1">
    </td></tr>
    `IF ( `__EARLY_EXIT` )`
        `BREAK`
    `ENDIF`
`REPEAT`
</table>
```


SLICCWARE™

Section 3 – Literals and Expressions



Numeric Literals

Text String Literals

Date-Time Literals

Dynamic Values

Dynamic Text Strings

Dynamic Date-Time Values

Section 3.1 – Numeric Literals

A literal is a value defined within the Display Template for use as function arguments, or within an expression. Three kinds of literals are supported: numeric literals, text string literals, and date-time literals.

A numeric literal is either a decimal constant or a hexadecimal constant. A decimal constant is expressed by a string of digits optionally preceded by a plus or minus sign. A hexadecimal constant is expressed by a zero followed by an "x" followed by from 1 to 8 hexadecimal digits (0-f). A numeric literal is always either enclosed within a pair of grave accents or as part of a larger expression enclosed within a pair of grave accents.

EXAMPLES

Compare the literal 2012 with the value in the variable "Value".

`IF ( 2012 == Value )`

Compare the hexadecimal literal for 39 with the value in the variable "Flags".

`IF( 0x0027 == Flags )`

A literal is a value defined within the Display Template for use as function arguments, or within an expression. Three kinds of literals are supported: numeric literals, text string literals, and date-time literals.

A text string literal is a string of text enclosed within a pair of quotation marks. A text string literal must not contain any control characters such as a newline character, carriage return, or tab.

```
`IF ( _@FIND( KeywordString, "politic" ) )`
```

If a quotation mark is to be contained within of the string of text,it must be preceded by a backslash as in the example below.

```
`IF ( _@FIND( KeywordString, "\"Jim Crow\"" ) )`
```

Back-slashes within a text string literal, not found at the end of a line, and not preceding a quotation mark are treated as simple text, and not removed. That way a DOS pathname may be entered just as it would be on a command line.

```
`IF ( _@FIND( SearchPath, "\test\data" ) )`
```

A back-slash at the end of a text string literal must be entered twice to avoid having it mistaken for an attempt to include the terminating quotation mark within the text string literal.

```
`IF ( _@FIND( SearchPath, "\test\data\\" ) )`
```

Section 3.3 – Date-Time Literals

A literal is a value defined within the Display Template for use as function arguments, or within an expression. Three kinds of literals are supported: numeric literals, text string literals, and date-time literals.

A date-time literal is a recognizable date, time, date-time constant, or a time duration value -- enclosed within a pair of quotation marks.

"4:05 pm"	*actual time*
"July 4, 2001"	*actual date*
"4:00 pm July 4, 2001"	*actual date and time*
"1 day"	*a time duration*

A large number of date and time formats are recognized. Some of the recognizable formats for date constants are:

"January 5, 2001"	**"Jan 5, 2001"**	**"20010105"**	**"010105"**
"01/05/2001"	**"01/05/01"**	**"1/5/2001"**	**"1/5/01"**
"01-05-2001"	**"01-05-01"**	**"1-5-2001"**	**"1-5-01"**
"5 January 2001"	**"5 Jan 2001"**		
"05/01/2001"	**"05/01/01"**	**"5/1/2001"**	**"5/1/01"**
"05-01-2001"	**"05-01-01"**	**"5-1-2001"**	**"5-1-01"**

A large number of date and time formats are recognized. Some of the recognizable formats for time constants are:

"4:05:30 PM"	**"4:05:30 pm"**	**"4:05 PM"**	**"4:05 pm"**
"16:05:30"	**"16:05"**	**"160530"**	**"1605"**

Any recognized format for a date constant can be combined with any recognized format for a time constant to produce a date-time constant. The date constant can either precede or follow the time constant. The only exception is the numeric format in which the date must always precede the time literal with a blank seperating them.

"20010105 160530"	*numeric format*
"20010105 1605"	*numeric format*
"010105 1605"	*numeric format*

"January 5, 2001 4:05 pm"	**"05 Jan 2001 4:05 pm"**
"4:05 pm January 5, 2001"	**"4:05 pm 05 Jan 2001"**
"4:05:30 PM 01/05/2001"	**"05-01-01 16:05"**

A time duration value is a numeric value coupled with a time duration unit. For constructing a time duration value, a limitted number of time duration units are recognized. They are:

"minute"	**"min"**	**"minutes"**	**"mins"**
"hour"	**"hr"**	**"hours"**	**"hrs"**
"day"	**"da"**	**"days"**	**"das"**
"month"	**"mo"**	**"months"**	**"mos"**
"year"	**"yr"**	**"years"**	**"yrs"**

Section 3.4 – Dynamic Values

Dynamic data is data, which unlike literals, must be determined at run time. Three types of *dynamic data* exist: *dynamic values*, *dynamic text strings*, and *dynamic date-time values*.

A dynamic value may be an HTML variable, a field value, a value generating function, or a numeric expression. A dynamic value is always either enclosed within a pair of grave accents or as part of a larger expression enclosed within a pair of grave accents.

An HTML variable is a name to which a value has been assigned, either as part of a name-value pair within the query URL, or as the result of an assignment statement within the Logic Template.

To learn more about assigning values to HTML variables see section 2.1 of the Logic Template Reference Manual.

A field value is a value extracted from a numeric field within the record currently being processed. It is expressed simply as the name of the numeric field defined within the Load Definition file.

```
<a href="`URL`"> ` Title` </a>
by `Author`
```

A value generating function is any numeric or string function which returns a numeric value. It is expressed by the function name, followed by the argument list enclosed in paranthesis.

```
`IF ( _@IMATCH( "News", Source ) )`
            . . .          . . .
`ENDIF`
```

To learn more about value generating functions, and to learn how to use them, see sections 4.1 thru 4.14.

A numeric expression is any combination of *HTML variables*, *field values*, *value generating functions*, and *numeric literals*, separated by appropriate operators, and grouped by one or more pairs of parenthesis.

Evaluation of the expression proceeds from the inner-most level of parenthesis outward, and then from left to right within each level. There is no precedence given to any operator over any other.

```
`( 123 + MyValue)`
`( ( ( BaseValue + Increment ) * 3 ) - 1 )`
```

To learn more about what operators are supported within numeric expressions and how to use them, see section 5.

Dynamic data is data, which unlike literals, must be determined at run time. Three types of *dynamic data* exist: *dynamic values*, *dynamic text strings*, and *dynamic date-time values*.

A dynamic text string may be an HTML string variable, a field string, field text block, or a string generating function. A dynamic text string is always either enclosed within a pair of grave accents or as part of a larger expression enclosed within a pair of grave accents.

An HTML variable is a name to which a value has been assigned, either as part of a name-value pair within the query URL, or as the result of an assignment statement within the Logic Template.

To learn more about assigning text strings to HTML variables see section 2.1 of the Logic Template Reference Manual.

A field string is a value extracted from a string field within the record currently being processed. It is expressed simply as the name of the numeric field defined within the Load Definition file.

```
<a href="`URL`"> ` Title` </a>
by `Author`
```

A field text block is a value extracted from a text field within the record currently being processed. It is expressed simply as the name of the numeric field defined within the Load Definition file.

```
<a href="`URL`"> ` Title` </a>
by `Author`
```

A text generating function is any function which returns a text string. It is expressed by the function name, followed by the argument list enclosed in paranthesis. String generating functions may be nested as in the second example below.

```
`_@SUBSTR( MyPath, 16, 255 )`
`_@CAT( "/data/test/", _@SUBSTR( MyPath, 16, 255 ) )`
```

To learn more about text generating functions, and to learn how to use them, see sections 4.15 thru 4.23.

Section 3.6 – Dynamic Date-Time Values

Dynamic data is data, which unlike literals, must be determined at run time. Three types of *dynamic data* exist: *dynamic values*, *dynamic text strings*, and *dynamic date-time values*.

A dynamic date-time value may be an HTML variable, a field date-time value, a relative date value, a relative time value, a relative date-time value, a simple date-time expression, or a complex date-time expression.

A dynamic date-time value can be used within any numerical expression where a date-time variable can be used. If a dynamic date-time value is to be displayed, it must be done using a Format command. Displaying it directly would result in it being displayed as a meaningless unsign integer value.

"today" *relative date*
"this hour" *relative time*
"now" *relative date-time*

Simple Expressions

"today - 3 days"
"1 hour + 30 mins"

define 12:00 noon last February 4th

"last year + 34 days + 12 hours"

Complex Expressions

Use NewDate if present, and OldDate if not, then subtract 3 days to obtain the start date

((NewDate |& OldDate) - "3 days")

Display todays date within a Display Template

`Format( "today", "DATE" )`

An HTML variable is a name to which a value has been assigned, either as part of a name-value pair within the query URL, or as the result of an assignment statement within the Logic Template.

To learn more about assigning dates and times to HTML variables see section 2.1 of the Logic Template Reference Manual.

A field date-time value is a value extracted from a date-time data field within the record currently being processed. It is expressed simply as the name of the date-time data field defined within the Load Definition file.

`_PUB_DATE` *publication date for article*

A relative date value is any one of a number of supported strings enclosed within a pair of quotation marks. The result returned is relative to the current system date.

"today" *relative date*

The following relative date values are recognized:

"yesterday"	*the current date minus one day*
"today"	*the current date*
"tomorrow"	*the current date plus one day*
"last day"	*the current date minus one day*
"this day"	*the current date*
"next day	*the current date plus one day*
"last week"	*Sunday of last week*
"this week"	*Sunday of the current week*
"next week"	*Sunday of next week*
"last month"	*the first of last month*
"this month"	*the first of this month*
"next month"	*the first of next month*
"last year"	*January first of last year*
"this year"	*January first of this year*
"next year	January first of next year

A relative time value is any one of a number of supported strings enclosed within a pair of quotation marks. The result returned is relative to the current system time.

"this hour" *relative time*

The following relative time values are recognized:

"last minute"	*the current date and time to the minute minus one minute*
"this minute"	*the current date and time to the minute*
"next minute"	*the current date and time to the minute plus one minute*
"last hour"	*the current date and time to the hour minus one hour*
"this hour"	*the current date and time to the hour*
"next hour"	*the current date and time to the hour plus one hour*

Section 3.6 – Dynamic Date-Time Values (cont.)

A relative date-time value is any one of a number of supported strings enclosed within a pair of quotation marks. The result returned is relative to the current system date and time.

"now" *relative date-time*

Only the following relative date-time value is recognized:

"now" *the current date and time*

A simple date-time expression can be either a combination of one or more time duration values connected by plus or minus signs; or a combination of one or more time duration values plus a relative date value or a relative time value or a relative date-time value, connected by plus or minus signs. A simple date-time expression is enclosed within quotation marks. No individual components of the expresion are independently enclosed within quotation marks.

Evaluation of the expression proceeds from left to right. There is no precedence given to any operator over any other.

"today - 3 days"
"1 hour + 30 mins"

A simple expression to define
12:00 noon last February 4th
"last year + 34 days + 12 hours"

A complex date-time expression is any combination of simple date-time expressions date, time, or date-time constants; date-time extractions; relative date, time or date-time values; and time duration values, and reasonable numeric functions; grouped by one or more pairs of parenthesis.

Evaluation of the expression proceeds from the inner-most level of parenthesis outward, and then from left to right within each level. There is no precedence given to any operator over any other.

Use NewDate if present, and OldDate if not,
then subtract 3 days to obtain the start date
((NewDate |& OldDate) - "3 days")

To learn more about what operators are supported within complex date-time expressions and how to use them, see section 5.

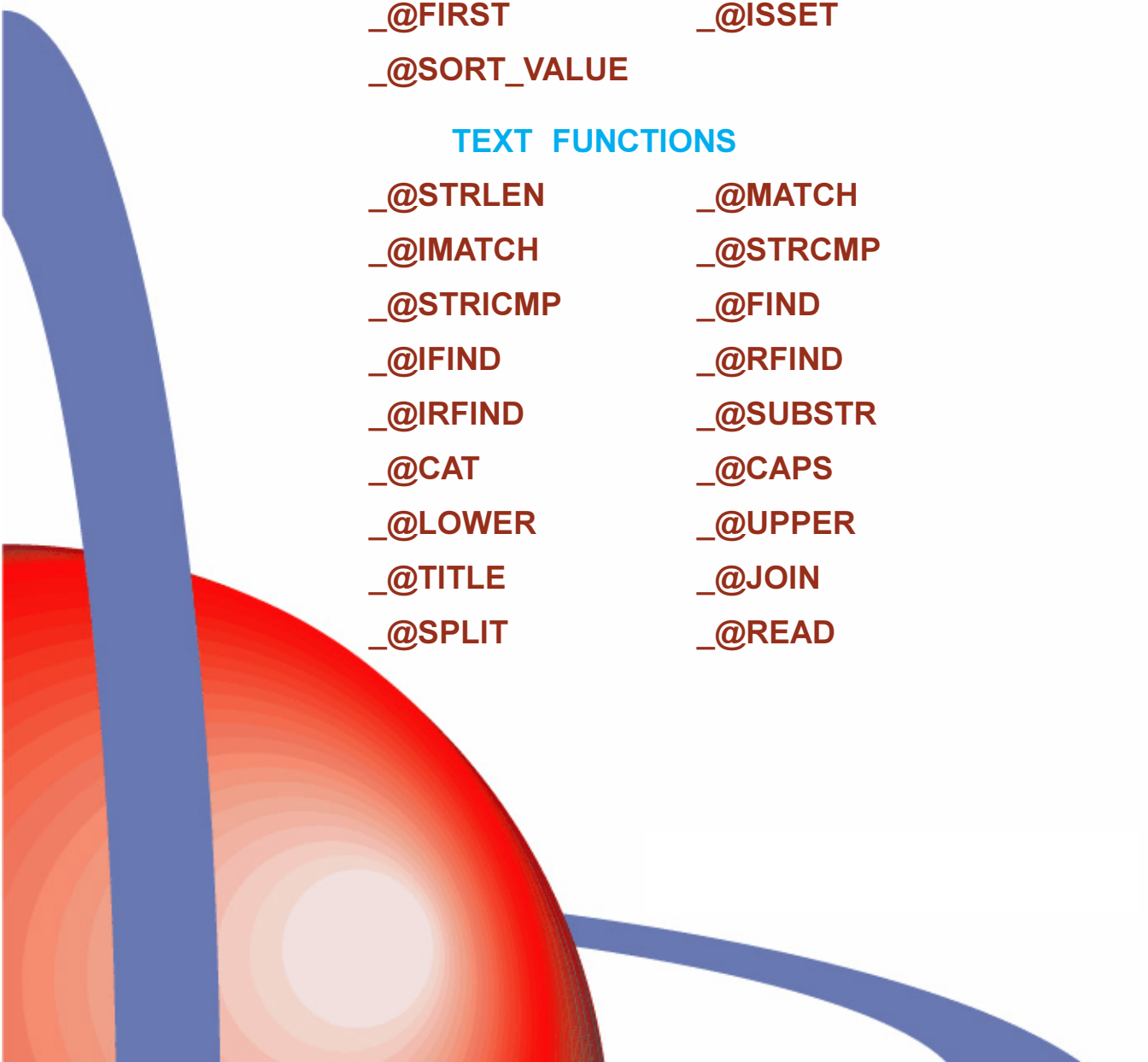
Section 4 – Functions

NUMERIC FUNCTIONS

_@MIN
_@MAX
_@FIRST
_@ISSET
_@SORT_VALUE

TEXT FUNCTIONS

_@STRLEN
_@MATCH
_@IMATCH
_@STRCMP
_@STRICMP
_@FIND
_@IFIND
_@RFIND
_@IRFIND
_@SUBSTR
_@CAT
_@CAPS
_@LOWER
_@UPPER
_@TITLE
_@JOIN
_@SPLIT
_@READ



Section 4.1 – Numeric Function – _@MIN

_@MIN is used to compare two or more values and return the smallest of them.

_@MIN is a value generating numeric function.

FORMAT

_@MIN(val_1, val_2 [, val_2 [...]])

Where:	**val_1**	is the first value to be compared
	val_2	is the second value to be compared
	val_3	is the third value to be compared
	...	continue for addition values

EXAMPLES

```
<!-- ## Return the smallest of the listed prices ## -->
`_@MIN( Price1, Price2, Price3, Price4 )`
```

_@MAX is used to compare two or more values and return the smallest of them.

_@MAX is a value generating numeric function.

FORMAT

_@MAX(val_1, val_2 [, val_2 [...]])

Where:	**val_1**	is the first value to be compared
	val_2	is the second value to be compared
	val_3	is the third value to be compared
	...	continue for addition values

EXAMPLES

```
<!-- ## Return the largest of the listed prices ## -->
`_@MAX( Price1, Price2, Price3, Price4 )`
```

Section 4.3 – Numeric Function – _@FIRST

_@FIRST is used to return the first in a list of values that is non-zero.

_@FIRST is a value generating numeric function.

FORMAT

_@FIRST(val_1, val_2 [, val_2 [...]])

Where:	**val_1**	is the first value to be tested
	val_2	is the second value to be tested
	val_3	is the third value to be tested
	...	continue for addition values

EXAMPLES

```
<!-- ## Return the first recorded date
        or todays date if no date available ## -->

`_@FIRST( PubDate, FileDate, ReleaseDate, "today" )`
```

_@ISSET is used to determine the state of an attribute within a selection mask. If the identified attribute is set within the attribute selection mask, a one is returned. If the identified attribute is not set within the attribute selection mask, a zero is returned.

An attribute selection mask is created using the *Load Selection Mask* command and is used to support filtering of results using attribute matching. The function, *_@ISSET,* can be used to determine whether or not the option associated with the attribute should be set when reflecting the user's selections back to him in the next form.

_@ISSET is a value generating numeric function.

For more information on inputing attribute data from selection lists within HTML forms see section 6.2.

For more information on the *Load Selection Mask* command see Section 2.2 of the *Logic Template Reference Manual*.

For more information of Filtering by attributes see sections 9.25 through 9.30 of the *Logic Template Reference Manual*.

FORMAT

_@ISSET(MaskID, AttrID)

Where: **MaskID** is the ID of the selection mask being tested
AttrID is ID of the individual attribute being tested

EXAMPLES

```
< !-- Select options desired in used car -- >
< select name="Features" >
    . . .
    < option value="11"
        `IF ( _@ISSET( 7, 11 ) )` SELECTED `ENDIF` >
        v-8 < /option >
    . . .
< /select >
```

Section 4.5 – Numeric Function – _@SORT_VALUE

_@SORT_VALUE is used to return the first in a list of values that is non-zero.

_@SORT_VALUE is a value generating numeric function.

FORMAT

_@SORT_VALUE(pass)

Where: **pass** is the sorting pass for which the value used is to be returned

EXAMPLES

```
<!-- ## Return the distance from the prime
        location for data sorted geo-spatially
        during the second pass ## -->

`FormatString( SORT_VALUE( 2 ) , “miles”, 1 )` mi.
```

_@STRLEN returns the number of characters in a text string.

_@STRLEN is a value generating text function.

FORMAT

_@STRLEN(string)

Where: **string** is the text string literal or the name of the text or string data field to be sized

EXAMPLES

```
<!-- ##  Display the length of a file path  ## -->
        The path length is ` _@STRLEN( Path )`.<br>
```

Section 4.7 – Text Function – _@MATCH

_@MATCH is used to compare two text strings. The two text strings are passed as arguments to the function. They are compared on a character by character basis.

Wild cards are supported in the comparison. A question mark (?) matches any character, and an asterisk (*) matches any string of characters.

If the two text strings are identical, the function returns 1.

If the two text strings are not identical, the function returns zero.

_@MATCH is a value generating text function.

FORMAT

_@MATCH(string_1, string_2)

Where: **string_1** is the first text literal or the name of the first text or string data field to be tested
string_2 is the second text literal or the name of the second text or string data field to be tested

EXAMPLES

```
<!-- ## Process  only if searching
        for the single word "politics" ## -->
`IF (  _@IMATCH( Keywords,  "politics" ) )`
                . . .              . . .
`ENDIF`
```

_@IMATCH is used to compare two text strings. The two text strings are passed as arguments to the function. They are compared on a character by character basis without regard to case. That is the two strings "HELLO" and "hello" would be considered identical.

Wild cards are supported in the comparison. A question mark (?) matches any character, and an asterisk (*) matches any string of characters.

If the two text strings when converted to the same case (all upper or all lower) are identical, the function returns 1.

If the two text strings when converted to the same case (all upper or all lower) are not identical, the function returns 0.

_@IMATCH is a value generating text function.

FORMAT

_@IMATCH(string_1, string_2)

Where: **string_1** is the first text literal or the name of the first text or string data field to be tested
string_2 is the second text literal or the name of the second text or string data field to be tested

EXAMPLES

```
<!-- ## Process  only if searching
        for the single word "politics" ## -->
`IF (  _@IMATCH( Keywords, "politics" ) )`
                . . .              . . .
`ENDIF`
```

_@STRCMP is used to compare two text strings just as *strcmp* is used in the *C* programming language. The two text strings are passed as arguments to the function. They are compared on a character by character basis.

Wild cards are supported in the comparison. A question mark (?) matches any character, and an asterisk (*) matches any string of characters.

If the two text strings are identical, the function returns a zero.

If the two text strings are not identical a result of -1 or 1 is returned. The determination of which is made in the following way:

> If the first text string is shorter than the second, but every character in the first text string is an exact match to the corresponding character in the second, a -1 is returned.
>
> If the second text string is shorter than the first, but every character in the second text string is an exact match to the corresponding character in the first, a 1 is returned.
>
> If the text strings do not match, and the first character within the first text string not to match the corresponding character in the second has a lower intrinsic value than the corresponding character in the second, a -1 is returned.
>
> If the text strings do not match, and the first character within the first text string not to match the corresponding character in the second has a higher intrinsic value than the corresponding character in the second, a 1 is returned.

_@STRCMP is a value generating text function.

FORMAT

_@STRCMP(string_1, string_2)

Where: **string_1** is the first text string literal or the name of the first text or string data field to be tested
string_2 is the second text string literal or the name of the second text or string data field to be tested

EXAMPLES

```
<!-- ## Only display cities begining with "M" ## -->
`IF ( ( 0  <=  _@STRCMP( City, "M" ) )
     && ( 0  >  _@STRCMP( City, "N" ) ) )`
          . . .              . . .
`ENDIF`
```

_@STRICMP is used to compare two text strings just as *strcasecmp* is used in the *C* programming language. The two text strings are passed as arguments to the function. They are compared on a character by character basis without regard to case. That is the two strings "HELLO" and "hello" would be considered identical.

Wild cards are supported in the comparison. A question mark (?) matches any character, and an asterisk (*) matches any string of characters.

If the two text strings are identical, the function returns a zero.

If the two text strings are not identical a result of -1 or 1 is returned. The determination of which is made in the following way:

> If the first text string is shorter than the second, but every character in the first text string is an exact match to the corresponding character in the second, a -1 is returned.
>
> If the second text string is shorter than the first, but every character in the second text string is an exact match to the corresponding character in the first, a 1 is returned.
>
> If the text strings do not match, and the first character within the first text string not to match the corresponding character in the second has a lower intrinsic value after being converted to lower case than the corresponding character in the second after being converted to lower case, a -1 is returned.
>
> If the text strings do not match, and the first character within the first text string not to match the corresponding character in the second has a higher intrinsic value after being converted to lower case than the corresponding character in the second after being converted to lower case, a 1 is returned.

_@STRICMP is a value generating text function.

FORMAT

_@STRICMP(string_1, string_2)

Where: **string_1** is the first text literal or the name of the first text or string data field to be tested
string_2 is the second text literal or the name of the second text/string data field to be tested

EXAMPLES

```
<!-- ## Only display cities begining with M or m ## --
>

`IF ( ( 0  <=  _@STRICMP(  City,  "M" ) )
     &&  ( 0  >  _@STRICMP(  City,  "N" ) ) )`
          . . .              . . .
`ENDIF`
```

Section 4.11 – Text Function – _@FIND

_@FIND is used to find if and where one text string is contained within the other. The first text string is searched for the first occurence of the second text string within it. If the second text string is found within the first text string, the location of the first occurence is returned. If not a zero is returned.

A one returned indicates the occurence of the second text string within the first text string begins with the *first* character of the first text string.

The comparison is case-sensitive.

ie: “Politics” would *not* match “politics”

If the text string “Hello!hello!hello!Hello” were searched for the text string “hello”, the result would be 7.

_@FIND is a value generating text function.

FORMAT

_@FIND(string_1, string_2)

Where: **string_1** is the text literal or the name of the text or string data field to be searched
string_2 is the text literal or the name of the text or string data field to be found

EXAMPLES

```
<!-- ## Process  only if searching
        for the word “politics” ## -->

`IF (  _@FIND(  Keywords,  “ politics ” ) )`

                . . .              . . .

`ENDIF`
```

_@IFIND is used to find if and where one text string is contained within the other. The first text string is searched for the first occurence of the second text string within it. If the second text string is found within the first text string, the location of the *first* occurence is returned. If not a zero is returned.

A one returned indicates the occurence of the second text string within the first text string begins with the first character of the first text string.

The comparison is *not* case-sensitive.

ie: “Politics” would match “politics”

If the string “Hello!hello!hello!Hello” were searched for the string “hello”, the result would be 1.

_@IFIND is a value generating text function.

FORMAT

_@IFIND(string_1, string_2)

Where: **string_1** is the text literal or the name of the text or string data field to be searched
string_2 is the text literal or the name of the text or string data field to be found

EXAMPLES

```
<!-- ## Process  only if searching
        for the word “politics” ## -->
`IF (  _@IFIND(  Keywords,  “ politics ” ) )`
              . . .              . . .
`ENDIF`
```

Section 4.13 – Text Function – _@RFIND

_@RFIND is used to find if and where one text string is contained within the other. The first text string is searched for the first occurence of the second text string within it. If the second text string is found within the first text string, the location of the *last* occurence is returned. If not a zero is returned.

A one returned indicates the occurence of the second text string within the first text string begins with the first character of the first text string.

The comparison is case-sensitive.

ie: "Politics" would *not* match "politics"

If the string "Hello!hello!hello!Hello" were searched for the string "hello", the result would be 13.

_@RFIND is a value generating text function.

FORMAT

_@RFIND(string_1, string_2)

Where: **string_1** is the text literal or the name of the text or string data field to be searched
string_2 is the text literal or the name of the text or string data field to be found

EXAMPLES

```
<!-- ## Process  only if searching
        for the word "politics" ## -->
`IF (  _@RFIND(  Keywords,  " politics " ) )`
                . . .              . . .
`ENDIF`
```

_@IRFIND is used to find if and where one text string is contained within the other. The first text string is searched for the first occurence of the second text string within it. If the second text string is found within the first text string, the location of the *last* occurence is returned. If not a zero is returned.

A one returned indicates the occurence of the second text string within the first text string begins with the first character of the first text string.

The comparison is *not* case-sensitive.

ie: “Politics” would match “politics”

If the string “Hello!hello!hello!Hello” were searched for the string “hello”, the result would be 19.

_@IRFIND is a value generating text function.

FORMAT

_@FIND(string_1, string_2)

Where: **string_1** is the text literal or the name of the text or string data field to be searched
string_2 is the text literal or the name of the text or string data field to be found

EXAMPLES

```
<!-- ## Process  only if searching
        for the word “politics” ## -->
`IF (  _@FIND(  Keywords,  “ politics ” ) )`
              . . .              . . .
`ENDIF`
```

_@SUBSTR is used to extract a text string from within another text string. The original text string, the location within the text string to begin copying, and the number of characters to copy are passed as arguments to the function.

If a value of 1 is passed for the location to begin copying, copying begins with the first character. If a value of 2 is passed for the location to begin copying, copying begins with the second character. And, so on.

If the location to begin copying is identified as zero or exceeds the number of characters in the original text string, nothing is copied.

If the number of characters to copy exceeds the number of characters remaining in the original text string, only the remaining characters in the text string are copied.

_@SUBSTR is a text generating text function.

FORMAT

_@SUBSTR(string, start, length)

Where: **string** is the text literal or the name of the text or string data field from which to extract the substring
start is the location within the text string containing the first character to be copied to the new text string. A value of 1 indicates start with the first character in the original text string.
length is the number of characters to be copied from the original text string to the substring

EXAMPLES

```
<!-- ##  Create a new file path with the base path
"/data/test/" and the file name from the original path ## --
>

 /data/test/` _@SUBSTR( Path, 16, 255 )`
```

_@CAT is used to combine two or more text strings into a single text string. The individual text strings to be concatenated are passed to the function, as arguments, in the order to be processed. The text strings being concatenated are joined end-to-end. No blanks are inserted or removed from between the individual text strings.

Within the Display Template, _@CAT is not required to concatenate text strings. To concatenate two text strings, they need only be placed side by side with no intervening blanks.

_@CAT is a text generating text function.

FORMAT

_@CAT(string_1, string_2 [, string_3 [, . . .]])

Where:

string_1	is the first text literal or the name of the first text or string data field to be included
string_2	is the second text literal or the name of the second text or string data field to be included
string_3	is the third text literal or the name of the third text or string data field to be included
. . .	continue in like manor to add text literals or text or string data fields

EXAMPLES

```
<!-- ##  Create a new file path using _@CAT
         with the base path "/data/test/"
         and the file name from the original path ## -->
        `_@CAT(  "/data/test/", _@SUBSTR( Path, 16, 255 ))`


<!-- ##  Create a new file path without using _@CAT
         with the base path "/data/test/"
         and the file name from the original path ## -->
        /data/test/` _@SUBSTR( Path, 16, 255 )`
```

Section 4.17 – Text Function – _@CAPS

_@CAPS returns a copy of the text string passed as an argument, with all words capitalized.

_@CAPS is a text generating text function.

FORMAT

_@CAPS(string)

Where: **string** is the text literal or the name of the text or string data field to be capitalized

EXAMPLES

```
<!-- ##  Display the title capitalized  ## -->
        ` _@CAPS( _ArticleTitle )`<br>
```

_@LOWER returns a copy of the text string passed as an argument, with all characters coverted to lower case.

_@LOWER is a text generating text function.

FORMAT

_@LOWER(string)

Where: **string** is the text literal or the name of the text or string data field to be converted to lower case

EXAMPLES

```
<!-- ##  Display the description in lower case  ## -->
        ` _@LOWER( _Description )`<br>
```

Section 4.19 – Text Function – _@UPPER

_@UPPER returns a copy of the text string passed as an argument, with all characters coverted to upper case.

_@UPPER is a text generating text function.

FORMAT

_@UPPER(string)

Where: **string** is the text literal or the name of the text or string data field to be converted to upper case

EXAMPLES

```
<!-- ##  Display the title in all uppercase  ## -->
        ` _@UPPER( _ArticleTitle )`<br>
```

_@TITLE returns a copy of the text string passed as an argument, with underscores and control-underscores converted to blanks, and all words capitalized.

_@TITLE can be used to reformat strings built previously using the _@JOIN function. _@TITLE acts just as _@SPLIT, with the exception that all resulting individual words are capitalized.

_@TITLE is a text generating text function.

FORMAT

_@TITLE(string)

Where: **string** is the text literal or the name of the text or string data field to be displayed as a title

EXAMPLES

```
<!-- ##  Display the file name as the document title  ## -->
      ` _@TITLE( _FileName )`<br>
```

LOAD DEFINITION FILE

```
; Create a category name for indexing from the folder name

      _Temp2          [@D02]
      _Folder2                `_@JOIN( _Temp2 )`
```

DISPLAY TEMPLATE

```
<!-- ##  Display the number of files (sections) and
        folder (as a chapter title) for each folder ## -->

 `__CATEGORY_SIZE` sections in ` _@TITLE( __CATEGORY )`.
```

Section 4.21 – Text Function – _@JOIN

_@JOIN returns a copy of the text string passed as an argument, with any series of blanks between words converted to a single control-underscore (join character). The join character is recognized by the keyword parsing software as a legitimate character, allowing the entire string to be treated as a single word for indexing and storage.

_@JOIN is normally used within Load Definition Files to allow for the creation of multiple word category names within a keyword index. _@SPLIT is then used within the Display Template to properly display the category names.

_@JOIN is a text generating text function.

FORMAT

_@JOIN(string)

Where: **string** is the text literal or the name of the text or string data field to be converted into a single word

EXAMPLES

LOAD DEFINITION FILE

```
; Create a category name for indexing from the
;  authors name stored in the meta-tag "BYLINE"

        _Author                 BYLINE
        _ByLine                 `_@JOIN( _Author )`
```

DISPLAY TEMPLATE

```
<!-- ##  Display the number of articles and
          author's name for each author category ## -->

 `__CATEGORY_SIZE`  articles by ` _@SPLIT(__CATEGORY )`.
```

_@SPLIT returns a copy of the text string passed as an argument, with all control-underscores (join characters) converted to blanks. The join character only exists within a normal text string as a result of a join function. Replacing all join characters with blanks returns the text string to its original form with excess blanks compressed out.

_@JOIN is normally used within Load Definition Files to allow for the creation of multiple word category names within a keyword index. _@SPLIT is then used within the Display Template to properly display the category names.

_@SPLIT is a text generating text function.

FORMAT

_@SPLIT(string)

Where: **string** is the text literal or the name of the text or string data field to be expanded to its original form

EXAMPLES

LOAD DEFINITION FILE

```
; Create a category name for indexing from the
;  authors name stored in the meta-tag "BYLINE"

        _Author                 BYLINE
        _ByLine                 `_@JOIN( _Author )`
```

DISPLAY TEMPLATE

```
<!-- ##  Display the number of articles and
         author's name for each author category ## -->

 `__CATEGORY_SIZE`  articles by ` _@SPLIT(__CATEGORY )`.
```

Section 4.23 – Text Function – _@READ

_@READ is used to send a command to, and elicit a response from a communications port. The machine address, port number, request or command that is to be written to the port are passed to the function as arguments.

The machine address may be either an IP address or a DNS name. The port must be a valid port number that is being monitored by an application that will be able to respond to the request or command being sent.

A session is opended with the identified port on the identified machine. The identified request is sent to the port and the response is returned by the function after closing the session with the port.

The size of the response must be limitted to 8192 bytes or less.

_@READ is a text generating text function.

FORMAT

_@READ(address, port, request)

Where: **address** is the machine address (IP address or name)
port is the port from which to elicit the response
request is the text string to be written to the socket in order to elicit a text response

EXAMPLES

Send the data string in _USER_UPDATE to port 2048 at IP address 192.168.1.123, and echo the response.

```
` _@READ( "192.168.1.123", 2048, _USER_UPDATE ) `
```

Section 5 – Operators

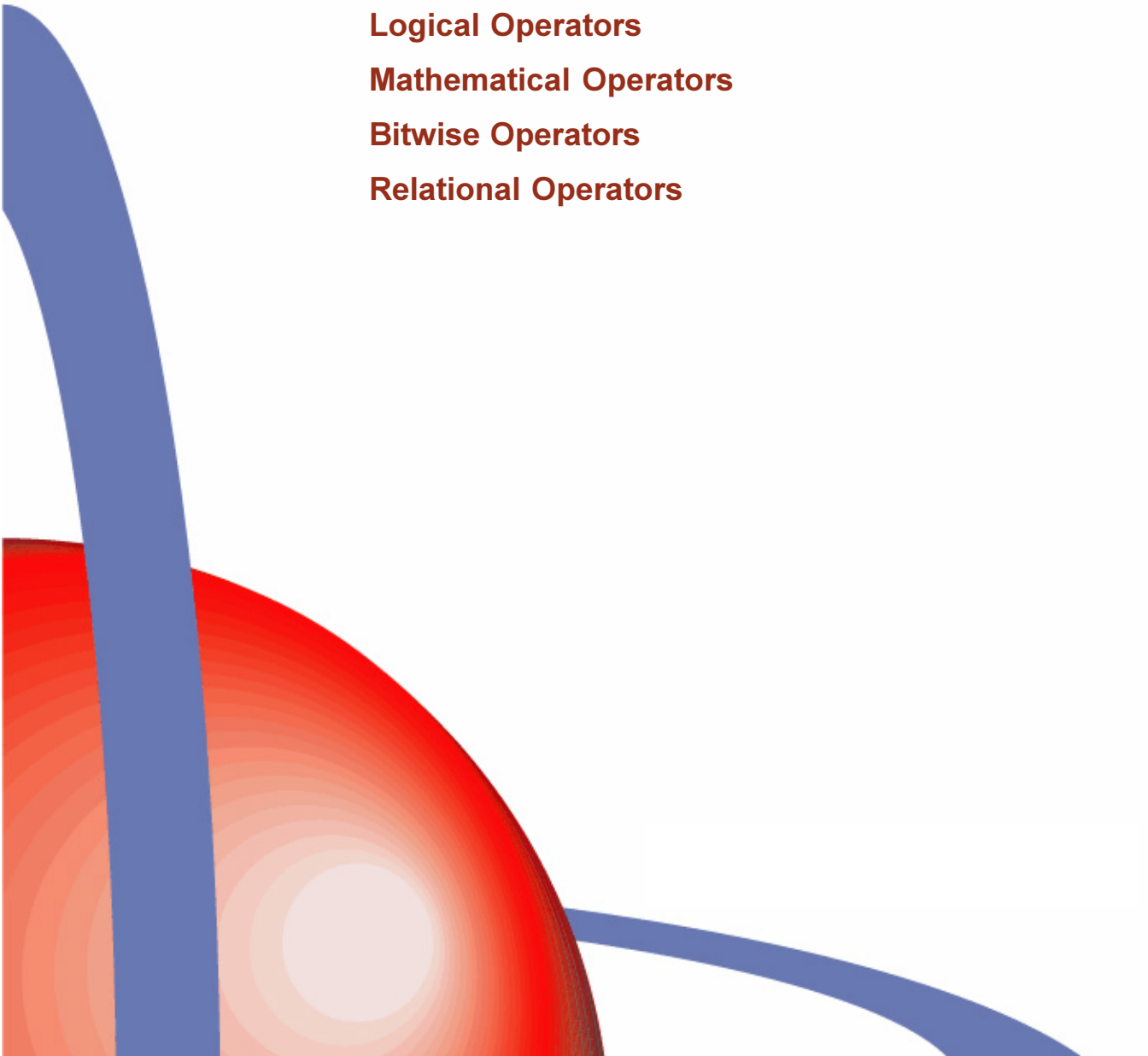
Equivalence Operators

Logical Operators

Mathematical Operators

Bitwise Operators

Relational Operators



Section 5.1 – Equivalence Operators

Operators are an integral part of any expression. What operators are supported determines the power of the software in processing expressions. Flexible Search supports a wide range of operators. Among them are equivalence operators, logical operators, mathematical operators, bitwise operators, and relational operators.

Equivalence operators are operators that compare two operands. Six types of equivalence operators are supported:

"=" or "=="	the binary operator *EQUAL TO* returns 1 if operands are equal
"!=" or "<>"	the binary operator *NOT EQUAL TO* returns 1 if operands are not equal
"<"	the binary operator *LESS THAN* returns 1 if the first operand is less than the second operand
">"	the binary operator *GREATER THAN* returns 1 if the first operand is greater than the second operand
"!<" or ">="	the binary operator *NOT LESS THAN* returns 1 if the first operand is not less than the second operand
"!>" or "<="	the binary operator *NOT GREATER THAN* returns 1 if the first operand is not greater than the second operand

Logical operators are operators that operate on the operands as logical values of *FALSE* or *TRUE*, that is zero or non-zero. Three types of logical operators are supported:

“!”	the unary negation operator *NOT* returns 0 for non-zero operand and 1 for operand of 0
“||”	the binary operator *INCLUSIVE OR* returns 1 if either operand is non-zero otherwise it returns 0
"&&"	the binary operator *RESTRICTIVE AND* returns 1 if both operands are non-zero otherwise it returns 0

Section 5.3 – Mathematical Operators

Mathematical operators are operators that operate on the operands as mathematical values to produce mathematical results. Six types of mathematical operators are supported:

"-"	the unary negation operator minus returns the operand multiplied by minus one
"-"	the binary operator for subtraction returns the 1st operand minus the 2nd operand
"+"	the binary operator for addition returns the 1st operand plus the 2nd operand
"*"	the binary operator for multiplication returns the 1st operand multiplied by the 2nd operand
"/"	the binary operator for integer division returns the result of the 1st operand divided by the 2nd operand and discards the remainder
"%"	the binary operator for modular division returns the remainder of the 1st operand divided by the 2nd operand and discards the result

Bitwise operators are operators that operate on the operands as collections of bits. Six types of bitwise operators are supported:

"~"	the unary negation operator *NOT* returns the operand with all bits inverted
"<<"	the binary operator *LEFT SHIFT* returns the 1st operand with the individual bits shifted, not rotated, to the left by the amount in the 2nd operand. Bits shifted off are lost. Bits shifted in from the right are 0.
">>"	the binary operator *RIGHT SHIFT* returns the 1st operand with the individual bits shifted, not rotated, to the right by the amount in the 2nd operand. Bits shifted off are lost. Bits shifted in from the left are 0.
"&"	the binary operator *RESTRICTIVE AND* returns for each pair of corresponding bits in the 1st and 2nd operand, a 1 if both bits are 1 and a 0 otherwise.
"|"	the binary operator *INCLUSIVE OR* returns for each pair of corresponding bits in the 1st and 2nd operand, a 1 if either bits is 1 and a 0 otherwise.
"^"	the binary operator inclusive *OR* returns for each pair of corresponding bits in the 1st and 2nd operand, a 0 if the two bits are identical and a 1 otherwise.

Section 5.5 – Relational Operators

Relational operators are operators compare the two operands and return one of the operands as a result. Three types of relational operators are supported:

"&<"	the binary operator *MAX* returns the larger of the two operands. A list of values seperated by the *MAX* operator returns the largest value in the list.
"&>"	the binary operator *MIN* returns the smaller of the two operands. A list of values seperated by the *MIN* operator returns the smallest value in the list.
"&|"	the binary operator *FIRST* returns the 1st operand if the value of the 1st operand is other than 0, and the 2nd operand otherwise. A list of values seperated by the *FIRST* operator returns the first non-zero value in the list.

Section 6 – HTML Forms

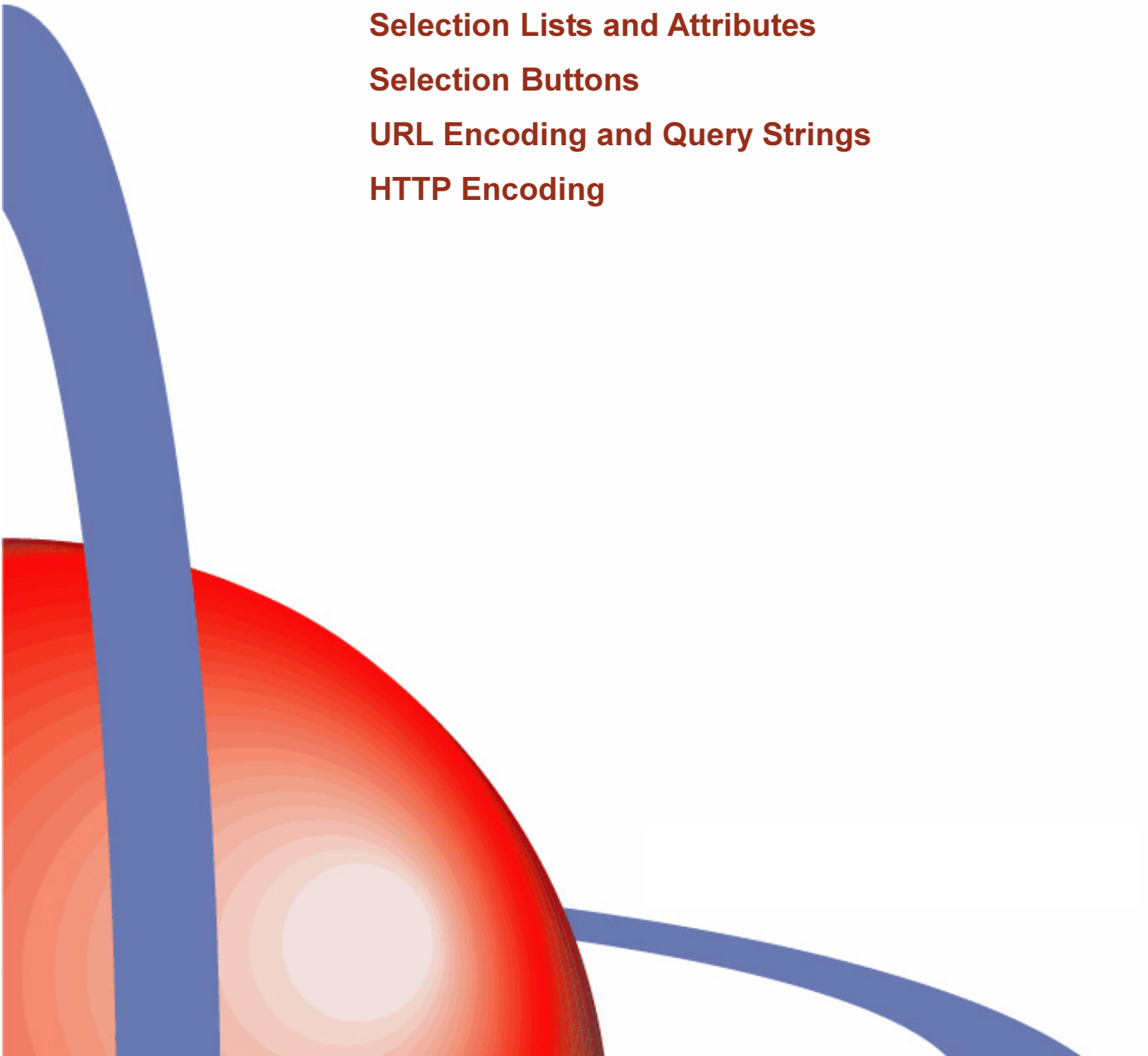
HTML Variables

Selection Lists and Attributes

Selection Buttons

URL Encoding and Query Strings

HTTP Encoding



Section 6.1 – HTML Variables

A search request is normally entered into the system as the result of an individual filling out an HTML form. In response to the user's input, the internet browser on the computer generates a query string and sends it to the search server as part of the URL.

A query string is a question mark, followed by a list of name value pairs terminated by two line feed characters. Each name value pair contains the name of an HTML variable, followed by an equals sign, followed by the value assigned to that HTML variable -- with special characters encoded to avoid confusion. Each name-value pair within the query string is seperated from any adjacent name- value pair by an ampersand. Values assigned to HTML Variables are treated as string data. See Figure 6.1.1.

Normally query strings within a URL are the result of a request sent from an HTML Form. In that case, each HTML Variable corresponds to a field within the form. Query strings may, however, be sent via a simple socket connect from another application with or without all the HTTP protocol wrappings.

A single name may be used more than once within a query string. When this occurs, each successive value string is concatenated to the previous value string with a single space intervening. The fully concatenated string becomes the resulting value assigned to the HTML variable. In this way multiple selection is supported within drop boxes. See Figure 6.1.2.

An HTML variable may also be assigned a value within the Logic Template whether or not a corresponding field exists with the same name within the query string. If the HTML variable already has been assigned a value string, the new value string is concatenated to the previous value string after an intervening blank.

Of course, the HTML variable can, in turn, be used to initialize the data value for the corresponding field the next time the form is displayed. If there is any possibility of special characters within the data stored by the variable, the data should be HTTP encoded.

EXAMPLES

Load the variable Keywords with input from an HTML form, and use that same variable to initialize the field the next time the form is displayed. Encode the string contained in the variable for HTTP transfer to avoid problems with special characters.

```
< input  name="Keywords"
         value="`HTTPEncode( Keywords )`" >
```

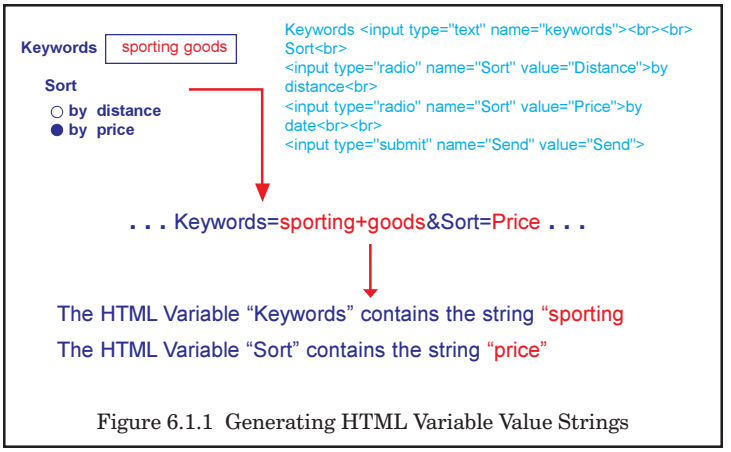


Figure 6.1.1 Generating HTML Variable Value Strings

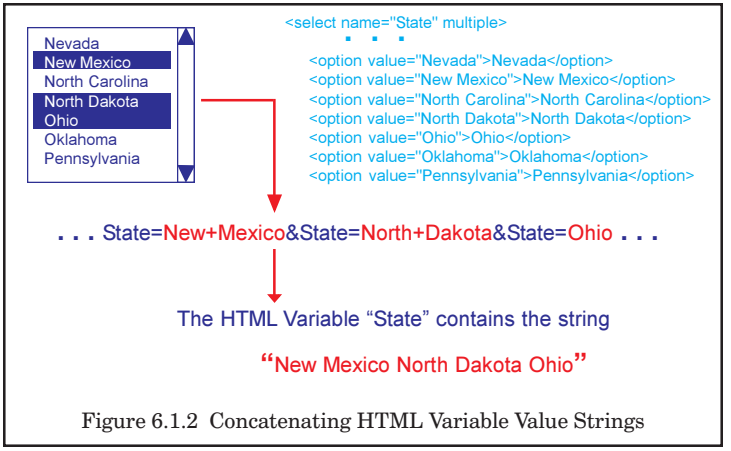


Figure 6.1.2 Concatenating HTML Variable Value Strings

Load the variable Count with input from selection list in an HTML form, and use that same variable to identify the selected entry the next time the form is displayed.

```
< select name="Count" >
    . . .
    < option value="20"
            `IF ( 20 == Count )` SELECTED `ENDIF` >
    20 < /option >
    . . .
< /select >
```

Section 6.2 – Selection Lists and Attributes

A *Selection List* can be used to set one or more attributes within an attribute array. To do this, the *Selection List* is defined as multi-select, and each *Option* in the *Selection List* is assigned a value from *1* to *n*, where *n* is the number of attributes in the attribute array. The variable with the same name as the *Selection List* is assigned the values selected. That variable is then used as part of a *Load Selection Mask* command within a *Logic Template* to set the appropriate attributes within an attribute selection mask. See Figure 6.2.1.

The next time the form is displayed the appropriate attributes within selection mask can be tested using the function *_@ISSET* to identify which options within the *Selection List* have been selected.

EXAMPLES

Load the variable Features with input from selection list in an HTML form, and use that variable to load a selection mask with ID 7 within the Logic Template for testing. Use the selection mask with ID 7 to identify the selected entry the next time the form is displayed.

DISPLAY TEMPLATE

```
< !-- Select options desired in used car -- >
< select name="Features" >
    . . .
    < option value="11"
        `IF ( _@ISSET( 7, 11 ) )` SELECTED `ENDIF` >
        v-8 < /option >
    . . .
< /select >
```

LOGIC TEMPLATE

```
// Load attributes into selection mask
LoadMask( 7, Features );

// Filter items without all attributes selected
AttributeSetFilter( MATCH_ALL, Options, 7 );
```

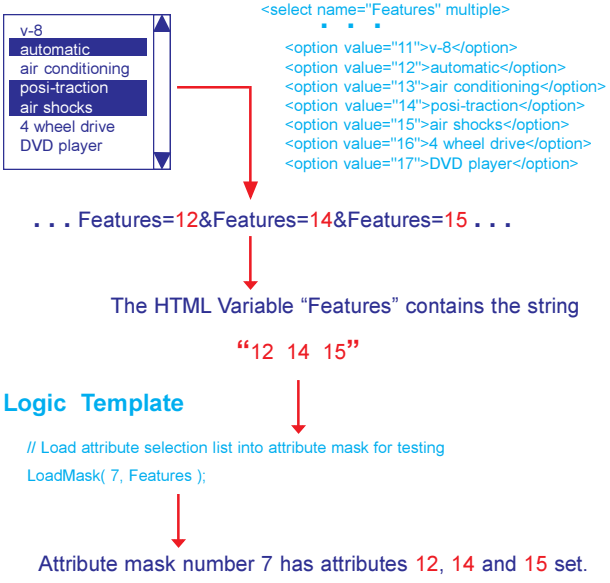


Figure 6.2.1 Concatenating HTML Field Data

Section 6.3 – Selection Buttons

A *Selection Button* is an extension to HTML, supported exclusively by Flexible Search, which allows a send button or image to identify the first item in the results list to be displayed. An ordinary HTML send button or image is converted to a *Selection Button* by renaming the HTML widget to *__NEW, __PRIOR* or *__NEXT*.

The *__NEW* button identifies the first item returned from the search as the first item to be displayed.

The *__PRIOR* button identifies the first item to be displayed as an item with a lower ordinal value than the first item in the current display. The ordinal value is calculated automatically by Flexible Search and can be obtained by accessing the corresponding system value *__PRIOR* directly using the format `*__PRIOR*`. If there are no prior results to be displayed, the sytem value *__PRIOR* contains zero.

The *__NEXT* button identifies the first item to be displayed as the item with the next higher ordinal value than the last item in the current display. The ordinal value is calculated automatically by Flexible Search and can be obtained by accessing the corresponding system value *__NEXT* directly using the format `*__NEXT*`. If there are no further results to be displayed, the sytem value *__NEXT* contains zero.

EXAMPLES

Define a numeric value button using an HTML back button.

```
`IF ( __PRIOR )`
<input type="submit" name="__PRIOR" value="<<">
`ENDIF`
```

Define a numeric value button using an HTML new search button.

```
<input type="submit" name="__NEW" value="Search">
```

Define a numeric value button using a next image.

```
`IF ( __NEXT )`
    <input type="image" src="next.gif"    width="36"
    height="24" name="__NEXT" value=">>">
`ENDIF`
```

A URL is a specially encoded text string that can be sent as part of an HTTP request to receive information from a server. A URL consists of a server address, followed by either a file path or a query string. A query string is a question mark (?) followed by a series of name-value pairs, each seperated from the other by an ampersand (&).

Each name-value pair consists of an HTML variable name (field name if from an HTML form), followed by an equals sign (=), followed by the value string to be assigned to the HTML variable. There are a number of special characters which the field string must not contain. If such characters are present within the field, they must be encoded for the URL to function properly.

The URLEncode command properly encodes those special characters to ensure the URL functions as it should. The URLEncode command should not be applied to the entire URL, entire query string, or even a complete name-value pair. Doing that would incorrectly mask the ampersands (&), question marks (?) and equals signs (=) which are special characters. the URLEncode command should only be applied to the value string being assigned in each name-value pair.

FORMAT

_@URLEncode(string)

Where: **string** is the text literal or the name of the text or string data field to be encoded

EXAMPLES

Build a hyperlink to continue the current search while limiting results to within the category of Mexican Cuisine. The back-slash at the end of each line allows the URL being created to span multiple lines without intervening blanks or new-line characters. The string "&" within the query string is the HTTP encoding for an ampersand. *See section 6.5 for more information.*

```
<a href="http://`_SERVER`:`_PORT`/?\
SearchString=`URLEncode( SearchString )`&amp;amp;\
Cuisine=`URLEncode( "Mexican Cuisine" )`">
<b>Mexican Cuisine</b></a>
```

Section 6.5 – HTTP Encoding

HTML identifies a number of characters as special characters. These include quotation mark (“), ampersand (&), greater-than (>), and less-than sign (<) from the 7-bit ascii set as well as a number of other characters outside that set. Any time a special character appears within the text portion of an HTML document, or within a string being used to define an HTML tag, and not part of the format of the HTML tag, the encoded form of the character should be used.

Many special characters have two encoded forms. All special characters have a numeric form: which is an ampersand(&), followed by the ascii decimal value for the character, followed by a semi-colon (;). Those that have two forms also have a mnemonic encoded form. The mnemonic form is an ampersand(&), followed by the mnemonic, followed by a semi-colon (;).

Any data retrieved from a search and being displayed as part of the search results list should be HTTP encoded. Also, any HTML text string variables being displayed should be HTTP encoded. That guarantees that special characters will be displayed correctly.

Finally, if constructing a URL, the ampersands seperating name-value pairs should be replaced with the encoded version “&”.

FORMAT

_@HTTPEncode(string)

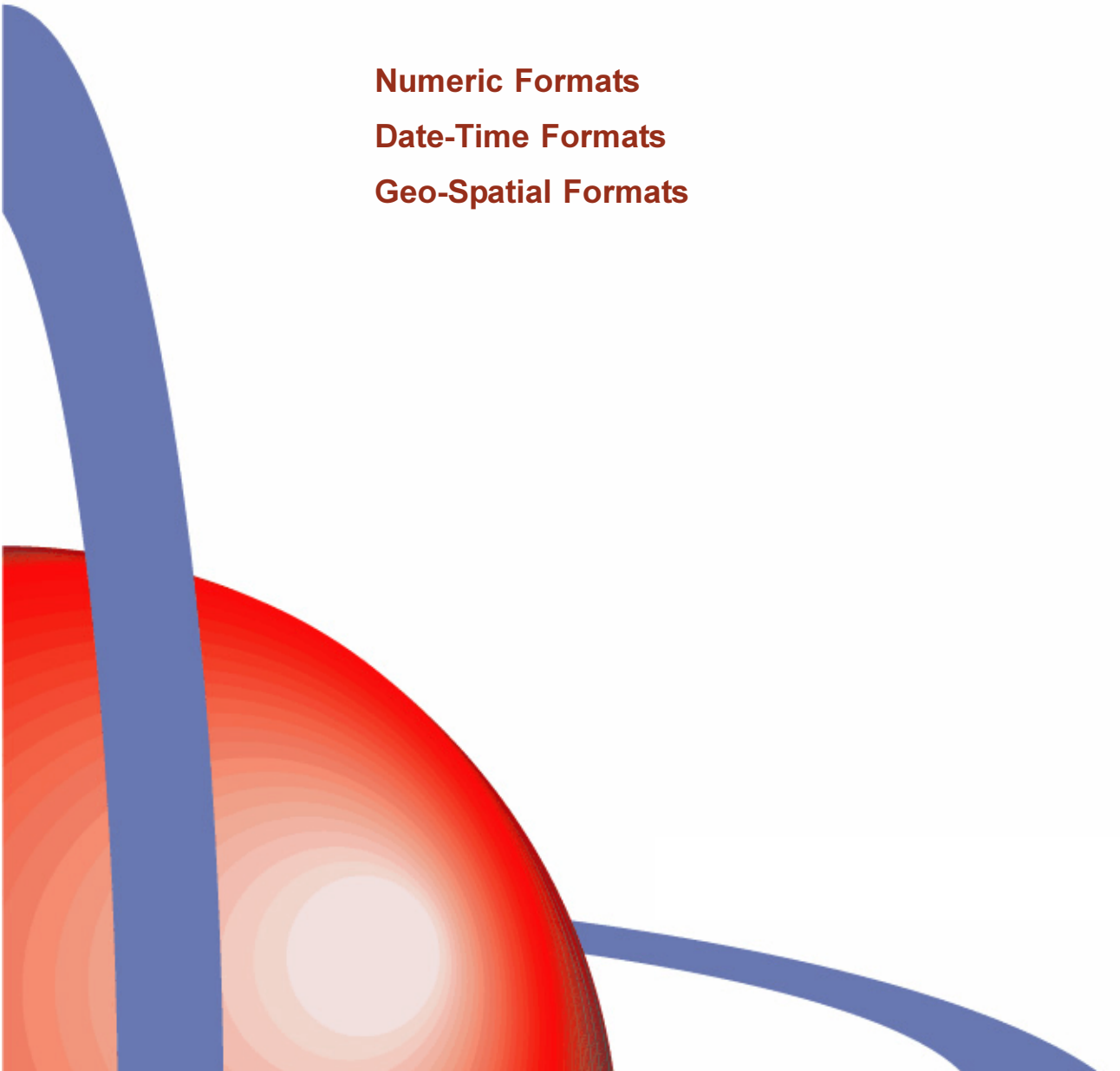
Where: **string** is the text literal or the name of the text or string data field to be encoded

EXAMPLES

Build a hyperlink to continue the current search while limiting results to within the category of Mexican Cuisine. The back-slash at the end of each line allows the URL being created to span multiple lines without intervening blanks or new-line characters. The system value __PARMS which contains the URL encoded search parameters is HTTP encoded for proper processing by the client browser. The string “&” within the query string is the HTTP encoding for an ampersand.

```
<a href="http://`__SERVER`:`__PORT`/?\
`HTTPEncode( __PARMS )`&amp;amp;\
Cuisine=`URLEncode( “Mexican Cuisine” )`”>
<b>Mexican Cuisine</b></a>
```

Section 7 – FormatString Statement



Numeric Formats

Date-Time Formats

Geo-Spatial Formats

Section 7.1 – Numeric Formats

The *FormatString* statement can be used to display numeric data in any of five supported numeric formats:

SIGNED	used to display numeric data which may be either positive or negative. Positive values are displayed unsigned while negative values are displayed with a leading minus sign.
UNSIGNED	used to display numeric data that can only be positive.
HEX	used to display numeric data as a hexadecimal value.
FIXED POINT	used to display fixed point numeric data.
CURRENCY	used to display numeric data as a currency value.

The entire *FormatString* statement, including parenthesis and arguments, must be enclosed within a pair of grave accents.

FORMATS

FormatString(value, "SIGNED")

Where: **value** is the numeric data field, variable, or expression to be formatted

FormatString(value, "UNSIGNED" [, size])

Where: **value** is the numeric data field, variable, or expression to be formatted
size is the number of digits to be displayed

FormatString(value, "HEX")

Where: **value** is the numeric data field, variable, or expression to be formatted

FormatString(value, "FIXED POINT", size [, count])

Where: **value** is the numeric data field, variable, or expression to be formatted

size is the number of decimal places implied within the value to be displayed

count is the number of digits to be displayed to the right of the decimal point

FormatString(value, "CURRENCY", units[, count])

Where: **value** is the numeric data field, variable, or expression to be formatted

units is the modular value used to determine what portion of the value to be displayed on either side of the decimal point. For a US dollar or mexican peso, it is 100 if cents or centavos are the storage unit.

count is the number of digits to be displayed to the right of the decimal point

EXAMPLES

Section 7.2 – Date-Time Formats

The *FormatString* statement can be used to display numeric data in any of ten supported *Date-Time Formats*:

DATE	used to display a date in conventional month-day-year format. ie: Jan 1, 2000.
TIME	used to display time in conventional hour-minute-am/pm format. ie: 11:00 pm.
DATE TIME	used to display date-time in conventional month-day-year-hour-minute-am/pm format. ie: Jan 1, 2000 11:00 pm.
TIME DATE	used to display date-time in conventional hour-minute-am/pm-month-day-year format. ie: 11:00 pm Jan 1, 2000.
12HR TIME	used to display time in conventional hour-minute-am/pm format. ie: 11:00 pm.
24HR TIME	used to display time in 24-hour-minute format. ie: 23:00.
12HR TIME DATE	used to display date-time in conventional hour-minute-am/pm-month-day-year format. ie: 11:00 pm Jan 1, 2000.
24HR TIME DATE	used to display date-time in 24-hour-minute-am/pm-month-day-year format. ie: 23:00 Jan 1, 2000.
DATE 12HR TIME	used to display date-time in conventional month-day-year-hour-minute-am/pm format. ie: Jan 1, 2000 11:00 pm.
DATE 24HR TIME	used to display date-time in month-day-year-24-hour-minute format. ie: Jan 1, 2000 23:00.

The entire *FormatString* statement, including parenthesis and arguments, must be enclosed within a pair of grave accents.

FORMATS

FormatString(data, "DATE")

Where: **data** is the date-time variable, expression or numeric data field to be formatted

FormatString(data, "TIME")

Where: **data** is the date-time variable, expression or numeric data field to be formatted

FormatString(data, "DATE TIME")

Where: **data** is the date-time variable, expression or numeric data field to be formatted

FormatString(data, "TIME DATE")

Where: **data** is the date-time variable, expression or numeric data field to be formatted

FormatString(data, "12 HR TIME")

Where: **data** is the date-time variable, expression or numeric data field to be formatted

FormatString(data, "24 HR TIME")

Where: **data** is the date-time variable, expression or numeric data field to be formatted

FormatString(data, "12 HR TIME DATE")

Where: **data** is the date-time variable, expression or numeric data field to be formatted

FormatString(data, "24 HR TIME DATE")

Where: **data** is the date-time variable, expression or numeric data field to be formatted

FormatString(data, "DATE 12 HR TIME")

Where: **data** is the date-time variable, expression or numeric data field to be formatted

FormatString(data, "DATE 24 HR TIME")

Where: **data** is the date-time variable, expression or numeric data field to be formatted

EXAMPLES

The *FormatString* statement can be used to display numeric data in any of fuve supported *Geo-spatial Formats*:

GEO DEGREES	used to display a latitude or longitude in degrees with a possible decimal fraction.
GEO MINUTES	used to display a latitude or longitude in degrees and minutes.
GEO SECONDS	used to display a latitude or longitude in degrees, minutes, and seconds.
MILES	used to display a distance used in geospatial searching, filtering or sorting in miles.
KILOS	used to display a distance used in geospatial searching, filtering or sorting in kilometers.

The entire *FormatString* statement, including parenthesis and arguments, must be enclosed within a pair of grave accents.

FORMATS

FormatString(coord, "GEO DEGREES" [, count])

Where: **coord** is the longitude or latitude in internal geo-spatial coordinate units
count is the number of digits to be displayed to the right of the decimal point

FormatString(coord, "GEO MINUTES" [, size])

Where: **coord** is the longitude or latitude in internal geo-spatial coordinate units

FormatString(coord, "GEO SECONDS")

Where: **coord** is the longitude or latitude in internal geo-spatial coordinate units

Section 7.3 – Geo-Spatial Formats (cont.)

FormatString(dist, "MILES" [, count])

Where: **dist** is the numeric data field, variable, or expression to be formatted
count is the number of digits to be displayed to the right of the decimal point

FormatString(dist, "KILOS" [, count])

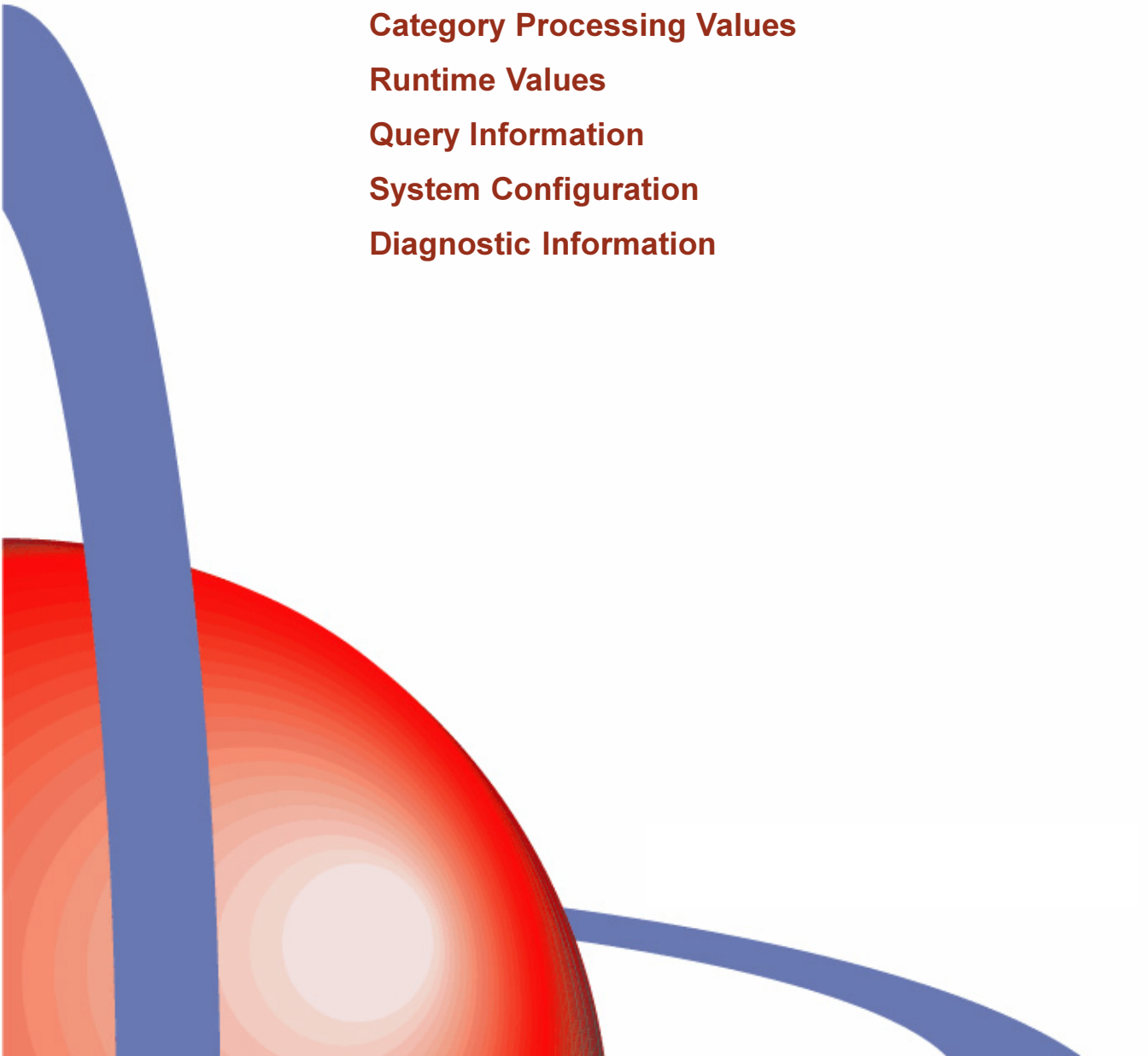
Where: **dist** is the numeric data field, variable, or expression to be formatted
count is the number of digits to be displayed to the right of the decimal point

EXAMPLES

```
<!-- ## Return the distance from the prime
        location for data sorted geo-spatially
        during the second pass ## -->

`FormatString( SORT_VALUE( 2 ) , "miles", 1 )` mi.
```

Section 8 – System Values



Basic Processing Values

Category Processing Values

Runtime Values

Query Information

System Configuration

Diagnostic Information

Section 8.1 – Basic Processing Values

System values are values used to define necessary constants, control processing, return information about the system or log activity through time. Some system values can be set within the *logic template,* however, most system values are read-only.

Each system value is identified by a name in full caps preceded by two underscores.

BASIC PROCESSING VALUES

__REQUEST_CNT
: Number of items requested to be displayed on each page of the search results.

__TOTAL
: The total number of items found matching the search criteria.

__COUNT
: Number of items to be displayed on the current page of the search results.

__FIRST
: The ordinal number (1 thru __TOTAL) of the first item to be displayed on the current page of the search results.

__PRIOR
: The ordinal number (1 thru __TOTAL) of the first item to be displayed on the previous page of the search results.

__NEXT
: The ordinal number (1 thru __TOTAL) of the first item to be displayed on the next page of the search results.

__LAST
: The ordinal number (1 thru __TOTAL) of the last item to be displayed on the current page of the search results.

__ORDINAL
: The ordinal number (1 thru __COUNT) of the current item being processed.

__ODD
: TRUE (1) if the value of __ORDINAL is odd. FALSE (0) if it is even.

CATEGORY PROCESSING VALUES

__DISTRIBUTED_TOTAL
: Total number of individual items found, among all the categories, matching the search criteria.

__CATEGORY_TOTAL
: Total number of categories found having items matching the search criteria.

__FIRST_CATEGORY
: Ordinal number (1 thru __CATEGORY_TOTAL) of the first category to be displayed.

__CATEGORY_COUNT
: Number of categories being displayed on the current page of the results.

__RUNNING_COUNT
: Total number of items displayed, up to this point, from all categories.

__CATEGORY
: Keyword (or base value if mapped to a range) which defines the category.

__CATEGORY_DELTA
: For category lists mapped to a range, the size of an individual subrange.

__CATEGORY_SIZE
: Number of items found within the category matching the search criteria.

RUNTIME VALUES

__CURRENT_DATE
Current local date.

__CURRENT_TIME
Current local time.

__CURRENT_DT
Current local date and time.

__TIME_STAMP
Current date and time in timestamp format.

__RANDOM_NUMBER
A simulated random number for use in generating uncacheable ad URLs among other things.

__THREAD
Thread performing the request.

__KEYWORD_SET
A search request of a keyword index has been made.

__RANGE_SET
A search request of a range index has been made.

__TIMELINE_SET
A search request of a timeline index has been made.

__SPATIAL_SET
A search request of a spatial index has been made.

__GEO_SPATIAL_SET
A search request of a geo-spatial index has been made.

__PACKAGE_SET
A search request of a package index has been made.

__HAS_INPUT
A search request of an index has been made.

__SEARCH_PERFORMED
A search was performed against at least one index.

__EARLY_EXIT
TRUE (1) if the recently exited loop did not run to completion. FALSE (0) if it did run to completion.

__PARMS
URL-encoded name-value pairs for all variables whose names do not begin with an underscore.

QUERY INFORMATION

__CLIENT_IP
IP address of the client machine sending the query.

__CLIENT_PORT
Port address of the client machine sending the query.

__REFERING_ITEM
Refering web page as extracted from the HTTP header.

__USER_AGENT
User agent as extracted from the HTTP header.

__LANGUAGE
Language identified by the HTTP header.

__ACCESS_MODE
The format of the query received:

1	Simple socket request
2	HTTP get operation
3	HTTP post operation
4	Simple echo test

__QUERY
The query received from the client.

__STATUS
The status of the current request.

__TRANSFER_SIZE
Number of bytes sent in response to query.

__SECURE_MODE
TRUE (1) indicates using SSL encryption. FALSE (0) indicates using insecure communication.

SYSTEM CONFIGURATION

__SERVER
: The IP address or DNS name of the server machine processing the template.

__PORT
: The port being used by the server to service insecure queries.

__SSL_PORT
: The port being used by the server to service secure queries using the SSL security protocol.

__LOGIC
: Resource ID of the Logic Template used to process the request.

__DISPLAY
: Resource ID of the Display Template used to display the results.

__LOG
: Resource ID of the Logging Template used to generate the transaction log.

DIAGNOSTIC INFORMATION

__START_DT
: Date and time at which application was launched.

__MEM_ALLOCATED
: Number of 8K blocks allocated from the system for use in loading indexes and processing requests.

__MEM_AVAILABLE
: Number of allocated 8K blocks not currently in use..

__MEM_PARTITIONED
: Number of allocated 8K blocks partitioned into smaller allocation units.

__CONNECT_COUNT
: Number of queries received since the status tabulations were last reset.

__DISCONNECT_COUNT
: Number of queries experiencing which timed out during transmission since the status tabulations were last reset.

__SUCCESS_COUNT
: Number of queries returning results since the status tabulations were last reset.

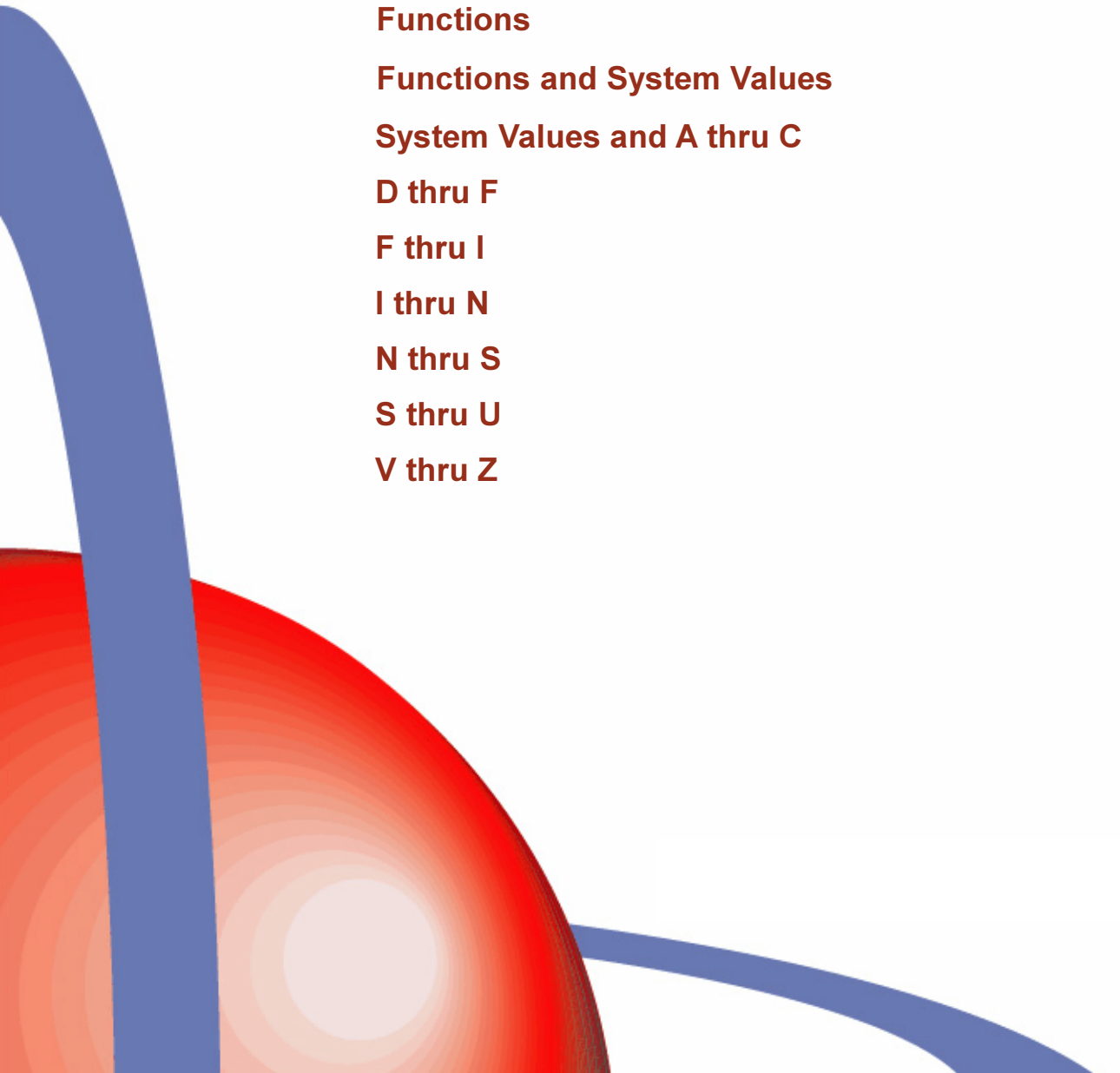
__FAILURE_COUNT
: Number of queries returning no results since the status tabulations were last reset.

__ERROR_COUNT
: Number of queries experiencing processing errors since the status tabulations were last reset.

__STATUS_RESET_DT
: Date and time at which the tabulation values were last reset.


SLICCWARE™

INDEX



Functions

System Values

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