

**SALSA Quick Reference:  
Object Creation, Modification, Input, and Output Commands**

(**Note:** The SALSA Language is **not** case sensitive. Use double hyphens ('--') to start a comment, which continues to the end of the line. Use the tilde character ('~') to indicate that a command continues on the next line.)

LANGUAGE COMMANDS	
Create	<p><b>Description:</b> Use the <b>create</b> command to create new variables, arrays, and array indexes (variables that reference array cells).</p> <p><b>Examples:</b></p> <pre>create array a1 with 5 cells --creates a new array 'a1' with 5 cells create array a2 with 2 rows and 4 columns --creates a new 2 row by 4 column array 'a2' create variable v1 --creates a new variable 'v1'; value defaults to 0 create variable i1 as index of a1 --creates new array index variable 'i1' at a1[0] create variable i2 as index 2 of a1 --creates new array index variable 'i2' at a1[2]</pre>
Set	<p><b>Description:</b> Use the <b>set</b> command to create new variables and array indexes (variables that reference array cells), as well as to change the values and properties of existing variables, arrays, and array indexes.</p> <p><b>Examples:</b></p> <pre>set v1 to 5 --variable 'v1' is created if it doesn't already exist set i1 to index 0 of a1 --array index 'i1' now references cell 0 of a1; i1 is created --if it doesn't already exist set a1[1] to true --sets the variable at array location a1[1] to true</pre>
Input	<p><b>Description:</b> Use the <b>input</b> command to prompt the user for a variable's value (integer, string, float, boolean); the variable is created if it doesn't already exist.</p> <p><b>Examples:</b></p> <pre>input v1 -variable 'v1' is assumed to be an integer input v2 as integer --forces the input of variable 'v2' to be an integer value input v3 as integer between 1 and 10 --forces the input to be integer between 1 and 10 input elements of a1 as integers -'a1' is an array whose elements are to be inputted</pre>
Populate	<p><b>Description:</b> Use the <b>populate</b> command to fill the empty cells of an existing array with variables.</p> <p><b>Examples:</b></p> <pre>populate a1 with random ints between 1 and 100 in ascending order --fills array 'a1' --with random integers sorted in ascending order populate a2 with random floats between 1.0 and 5.0 --fills array 'a2' w/random floats populate a3 with random strings of length 2 --fills array 'a3' with random strings populate a4 with random booleans --fills array 'a4' with random true/false values</pre>
Math	<p><b>Description:</b> Use the <b>math</b> commands (<b>add</b>, <b>subtract</b>, <b>multiply</b>, <b>divide</b>) to change an integer or float variable's value by applying a mathematical operation involving another integer or float value.</p> <p><b>Examples:</b></p> <pre>add 20 to v1 --adds 20 to the variable 'v1' subtract v1 from v2 --subtracts the value of variable 'v1' from value of variable 'v2' multiply value of v3 by 2.4 --multiplies the value of v3 by 2.4 divide a1[3] by 2 --The value of the variable at a1[3] is divided by 2</pre>
Print	<p><b>Description:</b> Use the <b>print</b> command to output a text string to the user. Use the &amp; character to concatenate strings together, as illustrated below.</p> <p><b>Examples:</b></p> <pre>print "The value of v1 is" &amp; v1 --Assuming v1 = 3, prints out "The value of v1 is 3" print "Array a1 has " &amp; cells of a1 &amp; " cells" --Assuming 'a1' has 5 cells, prints out --"Array a1 has 5 cells"</pre>

**SALSA Quick Reference:  
Conditional and iterative Execution Commands**

**LANGUAGE COMMANDS**

<b>If-Elseif-Else</b>	<p><b>Description:</b> Use the <b>if...elseif...else</b> construct to specify blocks of code that execute conditionally based on the results of true-false tests.</p> <p><b>Example:</b></p> <pre> <b>if</b> a1[left] = a1[right] --equality test   <b>print</b> a1[left] &amp; " equals " &amp; a1[right] <b>elseif</b> a1[left] &lt; a1[right] --less than test   <b>print</b> a1[left] &amp; " is less than " &amp; a1[right] <b>else</b>   <b>print</b> a1[left] &amp; " is greater than " &amp; a1[right] <b>endif</b>  <b>if</b> a1[i] <b>is-above</b> a1[j] --spatial test   <b>print</b> a1[i] " lies above " a1[j] <b>elseif</b> a1[i] <b>is-left-of</b> a1[j]   <b>print</b> a1[i] " lies left of " a1[j] <b>endif</b> </pre>	<p><b>Tip:</b> Below is a table of legal true-false (boolean) operators:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Operator</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>=</td> <td>is equal to</td> </tr> <tr> <td>&gt;</td> <td>is greater than</td> </tr> <tr> <td>&lt;</td> <td>less than</td> </tr> <tr> <td>&lt;=</td> <td>is less than or equal to</td> </tr> <tr> <td>&gt;=</td> <td>is greater than or equal to</td> </tr> <tr> <td>&lt;&gt;</td> <td>is not equal to</td> </tr> </tbody> </table> <p><b>Tip:</b> To enhance readability, you may enclose a true-false test in parentheses.</p> <p><b>Tip:</b> You can apply the spatial operators <b>is-above</b>, <b>is-below</b>, <b>is-left-of</b>, and <b>is-right-of</b> to array locations, as illustrated in the second example on the left.</p>	Operator	Meaning	=	is equal to	>	is greater than	<	less than	<=	is less than or equal to	>=	is greater than or equal to	<>	is not equal to
Operator	Meaning															
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<=	is less than or equal to															
>=	is greater than or equal to															
<>	is not equal to															
<b>While</b>	<p><b>Description:</b> Use the <b>while...endwhile</b> construct to specify a loop that executes as long as its true-false condition evaluates to true.</p> <p><b>Example:</b></p> <pre> <b>while</b> i1 &lt; cells <b>of</b> a1 --continue looping while                                 --array index 'i1' refers                                 --to a valid cell in 'a1'   <b>if</b> a1[i1] &gt; currentMax     <b>set</b> currentMax <b>to</b> a1[i1]   <b>endif</b>   <b>add</b> 1 <b>to</b> i1 <b>endwhile</b> </pre>	<p><b>Tip:</b> True-false tests for <b>while</b> loops are the same as those in <b>if...elseif...else</b> statements; consult the table above for legal operators.</p>														

**SALSA Quick Reference:  
Data Movement Commands**

**LANGUAGE COMMANDS**

<b>Move</b>	<p><b>Description:</b> Use the <b>move</b> command to move a variable, array, or array index to a new location.</p> <p><b>Examples:</b></p> <pre> <b>move</b> v2 <b>to</b> a1[3] --moves variable 'v2' to cell 3 of a1, which must not be occupied. <b>move</b> a1[x] <b>to</b> a1[x+1] --moves variable at a1[x] one cell to the right <b>move</b> i1 <b>left</b> --moves array index 'i1' left 1 cell <b>move</b> i1 <b>right</b> 2 <b>cells</b> --moves array index 'i1' right 2 cells <b>move</b> i1 <b>to start of row</b> --moves index 'i1' to first cell in the array </pre>	
<b>Swap</b>	<p><b>Description:</b> Use the <b>swap</b> command to cause two variables or array indexes to swap positions.</p> <p><b>Examples:</b></p> <pre> <b>swap</b> a1[i] <b>with</b> a2[j] --exchanges two variables in different arrays <b>swap</b> a1[i] <b>with</b> a1[i+1] --exchanges two adjacent variables in same array exchange </pre>	