



How to Use the Build Array Function Tutorial

Functions -> Programming -> Array  -> Build Array 

To place a Build Array function, open the Functions palette and select the Programming sub-palette. Then select the Array palette where you should find the Build Array function.

The Build Array function takes in a series of inputs and forms an array of appropriate dimension and size. The order of the inputs is shown in Figure 1. (Note that the context help window can be accessed with Ctrl + h) To increase or decrease the number of inputs, simply click and drag that bottom of the Build Array function until you get the desired number of inputs as shown in Figure 1.

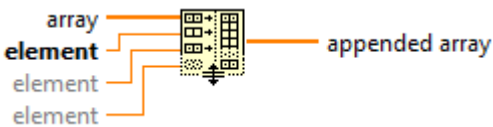


Figure 1

The Build Array Function for the One Dimensional Inputs

The elements get appended to the input array in the order that they are supplied. The elements also get appended to the end of the array so originally if the input array is [1 2 3 4] and the sequence of elements to append are 5, 6, and 7, to produce [1 2 3 4 5 6 7] we would wire the Build Array function as shown in Figure 2.

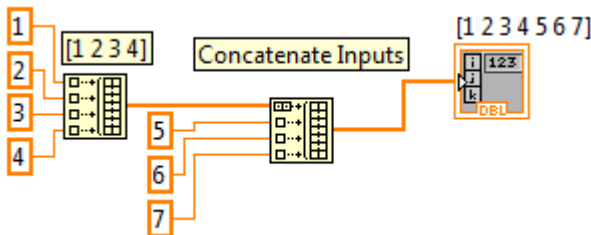


Figure 2

Notice in Figure 2, we can also initialize an array using the Build Array function starting off with a single element. This is because the Build Array function treats a single value as a 1 x 1 array of one value.

Also notice that if the initial value for the “array” input is a single numeric value then the Build Array function treats this element as a one dimensional array of length 1 and simply appends the other elements accordingly.

The Build Array Function for Higher Dimensional Inputs

It is also possible to append arrays or use arrays and single numeric inputs to the Build Array function at the same time. Figure 3 demonstrates the same operation as Figure 2 but constructs two

arrays and appends them as opposed to concatenating individual inputs to a pre-initialized array. In Figure 4, you can see that the Build Array function can take in both arrays and single numeric values when concatenating inputs.

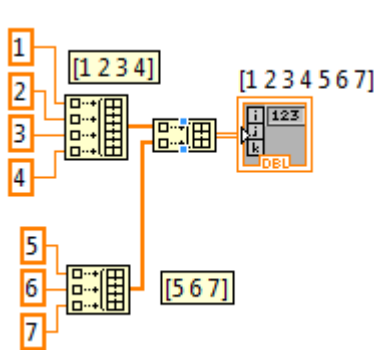


Figure 3

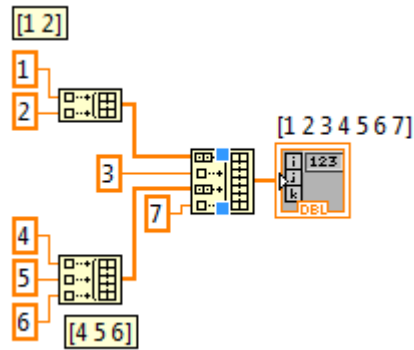


Figure 4

To append two dimensional arrays, the Build Array function simply appends the input to the original array by rows. So if we append a 2 x 2 array with a 1 x 5 array, then the resulting array places the 1 x 5 array as a third row of the 2 x 2 array as shown in Figure 6. Notice that the new array size must accommodate the maximum dimension so the new array is 3 x 5. The block diagram for this example is shown in Figure 5.

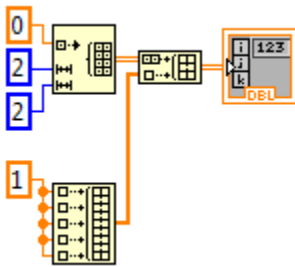


Figure 5

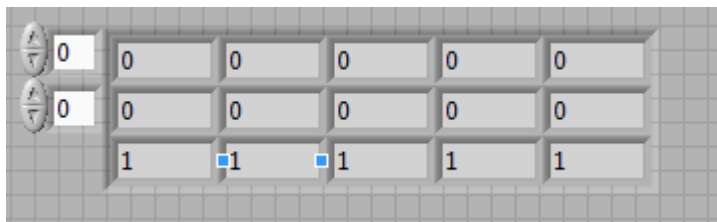


Figure 6

In this example we can see where the 1 x 5 array of 1s gets appended to the 2 x 2 array of 0s. For higher dimensional arrays, generally the subsequent input arrays are appended such that each input regardless of its dimension is treated like an element and put into a one dimensional array. The one dimensional array is then adjusted to account for array dimensions. For instance, if we were given matrices A, B, and C with dimensions 2 x 2, 1 x 9, and 3 x 3 respectively, the Build Array Function would produce the following array as shown in Figure 7.

