LabVIEW Intro

Pasco-Ray Programming Guide

Team RUSH 27 LabVIEW

Matt Pasco

Michael Ray

LabVIEW Intro

Table of Contents

6 Arrays

7 Arrays Continued

8 Loops Continued

a Image of Loops in LabVIEW

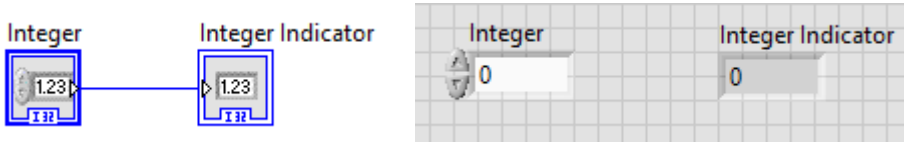
Intro to Variables, Types, and Loops

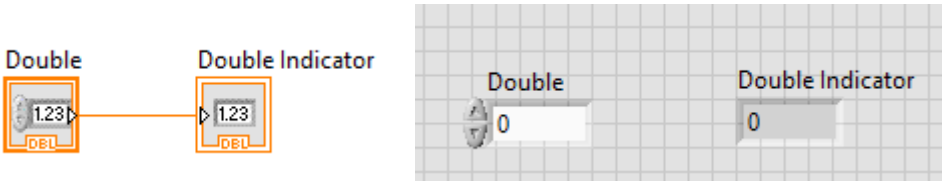
- **Data Types**
  - Data types are the main Variable types you will be using in LabVIEW. They are color coded and easy to see. They consist of
  - Integer
  - Numeric/Double
  - String
  - Boolean
  - Comparison Tablets

- **Loops**
  - Loops are specific amounts of code that you want to run for the specified amounts of times for certain parameters until something is completed. They Consist of
  - For Loops
  - While Loops
  - Case Structures
  - Timed Structures
  - Disabled Diagrams

- Flat Sequenced

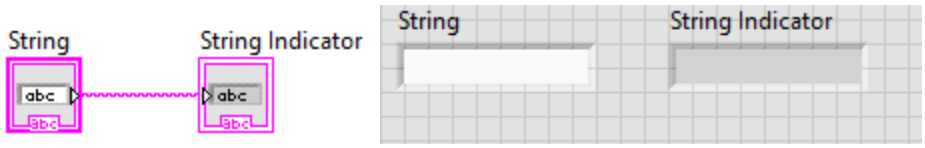
Data Types

- **Integers**
  - **Color Code: Blue**
  - Integers are any **whole** number from -∞ to +∞
  - Example
    - A counter used to count Number of Balls in Robot
  - 

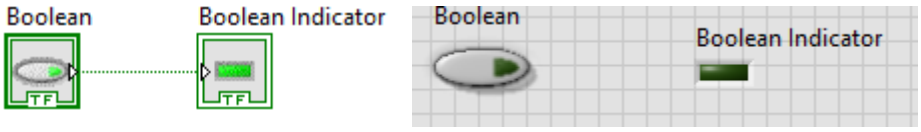
- **Numeric/Double**
  - **Color Code: Orange/Yellow**
  - Any number (can include Decimals) from -∞ to +∞
  - Example
    - Counting Encoder Rotations (has decimals to represent half turns
  - 

- **String**
  - **Color Code: Pink**

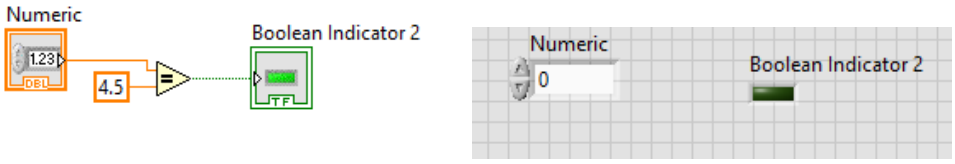
- Letters/Words
- Example
  - Read the name of a text file that is place on the cRIO



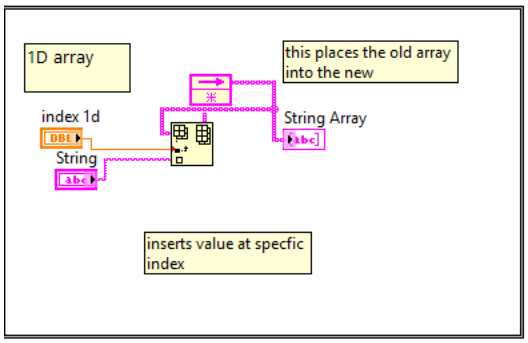
- **Booleans**
  - **Color Code: Green**
  - True or False/ ON or OFF
    - When a button on a gamepad is hit it becomes True

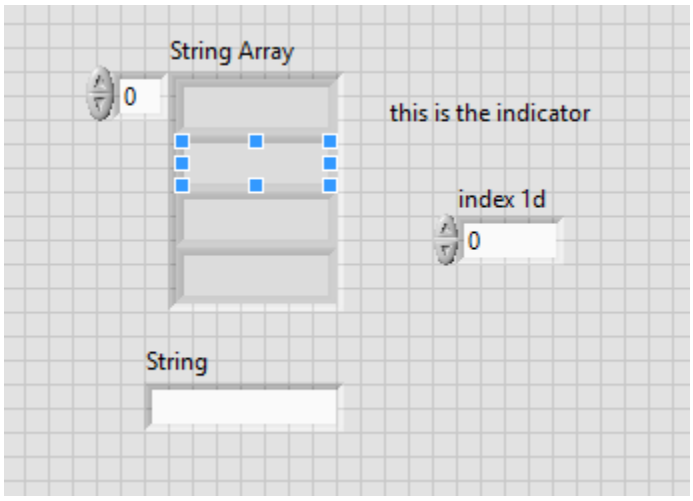


- **Comparison**
  - **Color Code: Green can be changed**
  - Used to compare two variables of the same data type
  - Example
    - Check to see if the encoder rotations are greater than

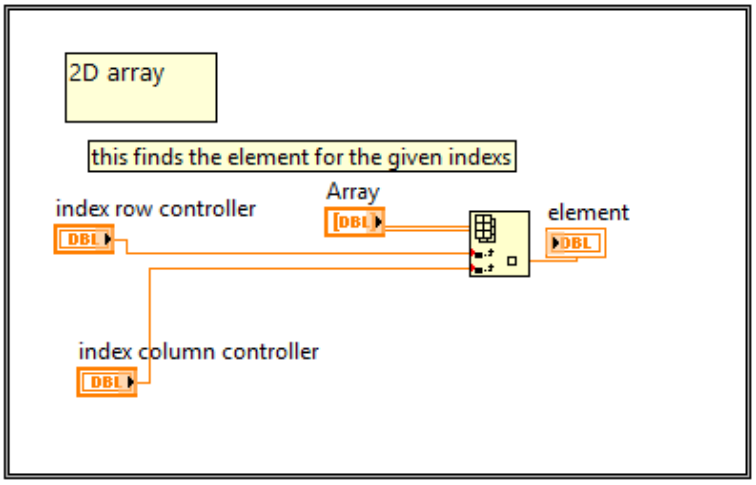


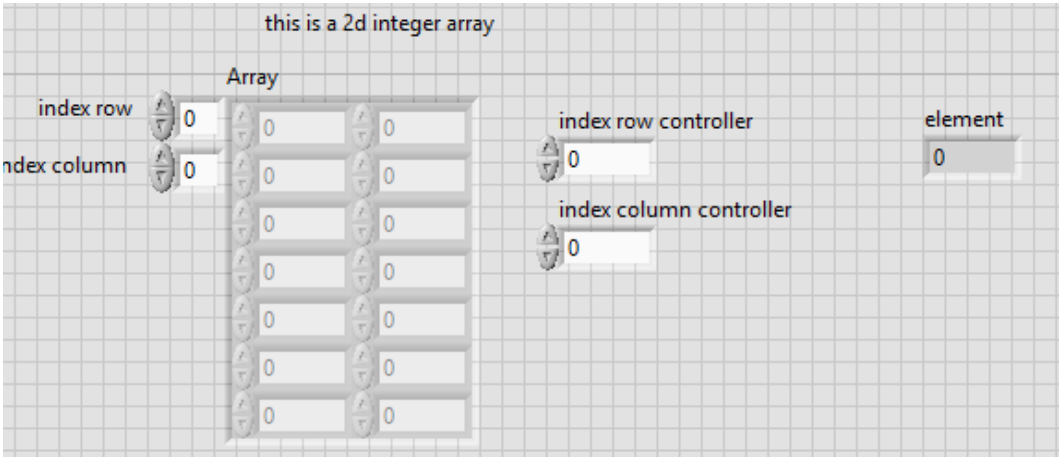
Arrays

- **Index**
  - think of it as a coordinate point or as a cell in excel
  - **ALWAYS STARTS AT 0**
  - **1D array**
    - It will only have a single index (x coordinate)
  - 

  - 

- **2D array**
  - It will have two (x coordinate and one for y coordinate)





- **Data**
  - **YOU CAN ONLY HAVE ONE DATA TYPE**
  - ex
    - You can have an array of only booleans, you **cannot** have an array of booleans and strings
- **Example**
  - We use arrays for auton storing motor values, direction and case selector values (see page 6) as integers and index 0 be case selector, 1 heading, 2 power, ect...
  - here is an array called string_array
    - string_array(0)= “hello”
    - string_array(1)= “bye”
    - string_array(2) = “robots”
  - So if we send an index value of 1 it will send back “bye”

Loops

- **For Loops**
  - A loop that runs for a set amount of times
  - **NOTE:** The number of times includes 0 so if you set it for 4 it will repeat 5 times for 0,1,2,3,4.
  - **Example**

        - I want the counter to update x times

- **While**
    - A loop that repeats until a set condition is met
    - **NOTE:** The loop must be able to repeat
    - **Example**
        - I want to drive the motors while my distance is less than 3ft.
- **Case Structure**
    - A loop that can do different things depending on what is inputted into the case
    - Any variable can be put into it (see page 3 “Data Types”)
    - **Example**
        - If Boolean is true I want my counter to add 1 but if it is false subtract 1.
- **Timed Structures**
    - A loop that iterates every x amount of time
    - **Example**
        - I want to add 1 to the time every 1000ms
- **Disable Diagram**
    - Used for disabling code

-
- **Example**
  - Disabling code that is not complete to test other parts

- **Flat Sequence**
  - Chooses what will run from left to right
  - **Example**
    - I want to turn *then* I will drive *then* I will shoot