Project 2: Row of LED Blink

Description:

We will now wire 8 LED lights into the Arduino board and use these lights to create patterns (Chase, all on, all off, alternate blink . . .)
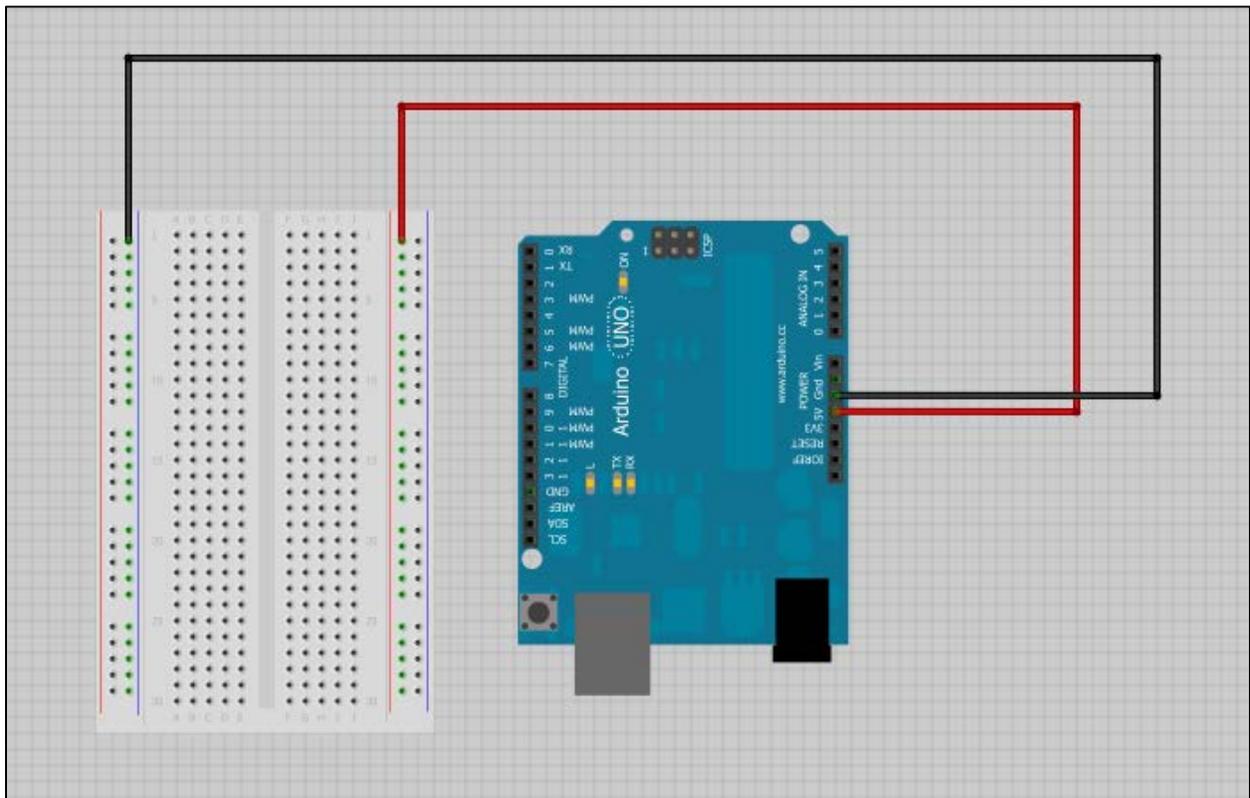
Build and Wiring:

You will need:

1. 8 LED bulbs (Any color)
2. 8 330 Ohm resistors
3. Red Wire
4. Black or dark colored wire
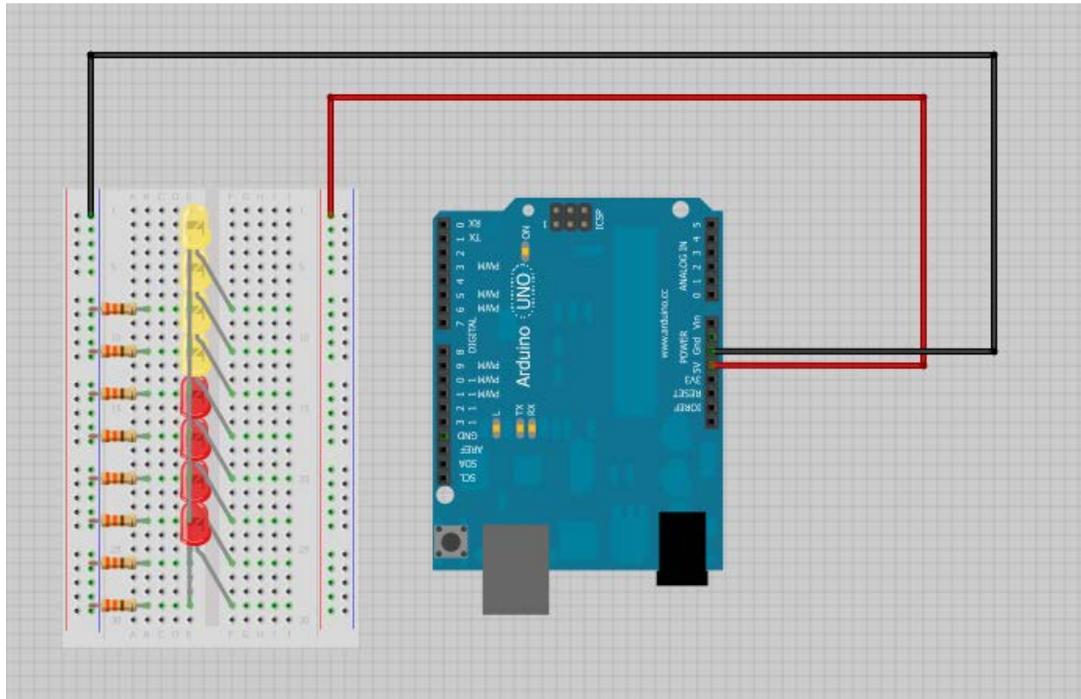5. 8 light colored (white) signal wires

Process:

1. Start with the LED setup from Project 1. Remove the LED bulb and Resistor. You will be left with the red wire for 5V and the black wire for Ground.
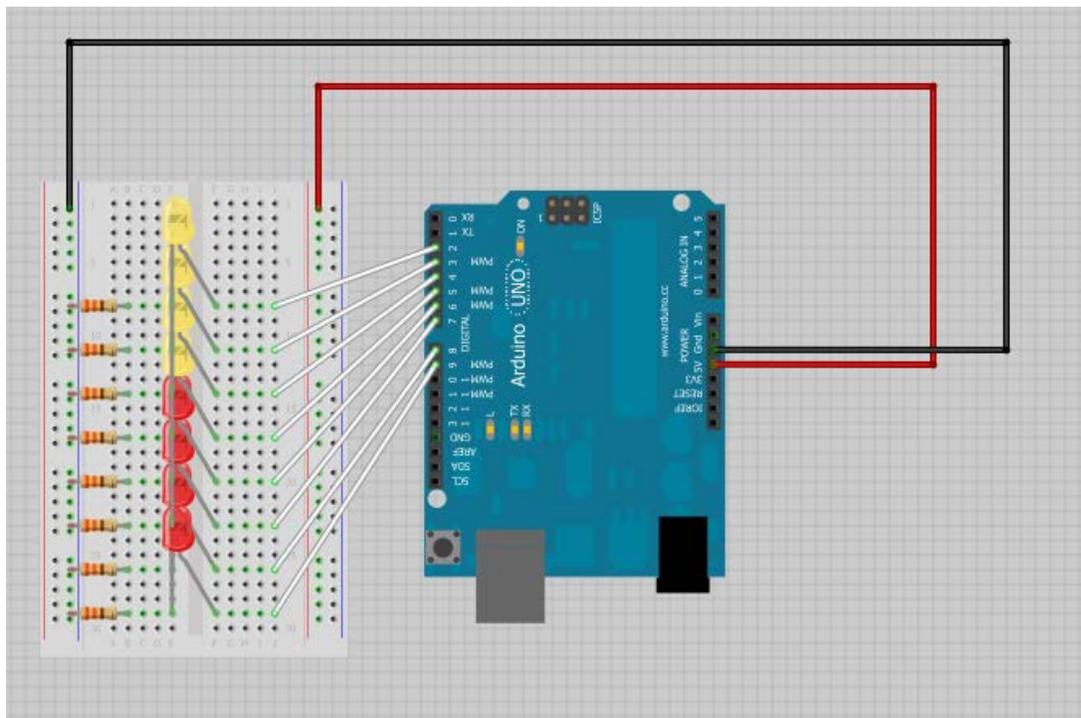
2. Place the 8 LED bulbs down the center of the Breadboard. (Colors do not matter)
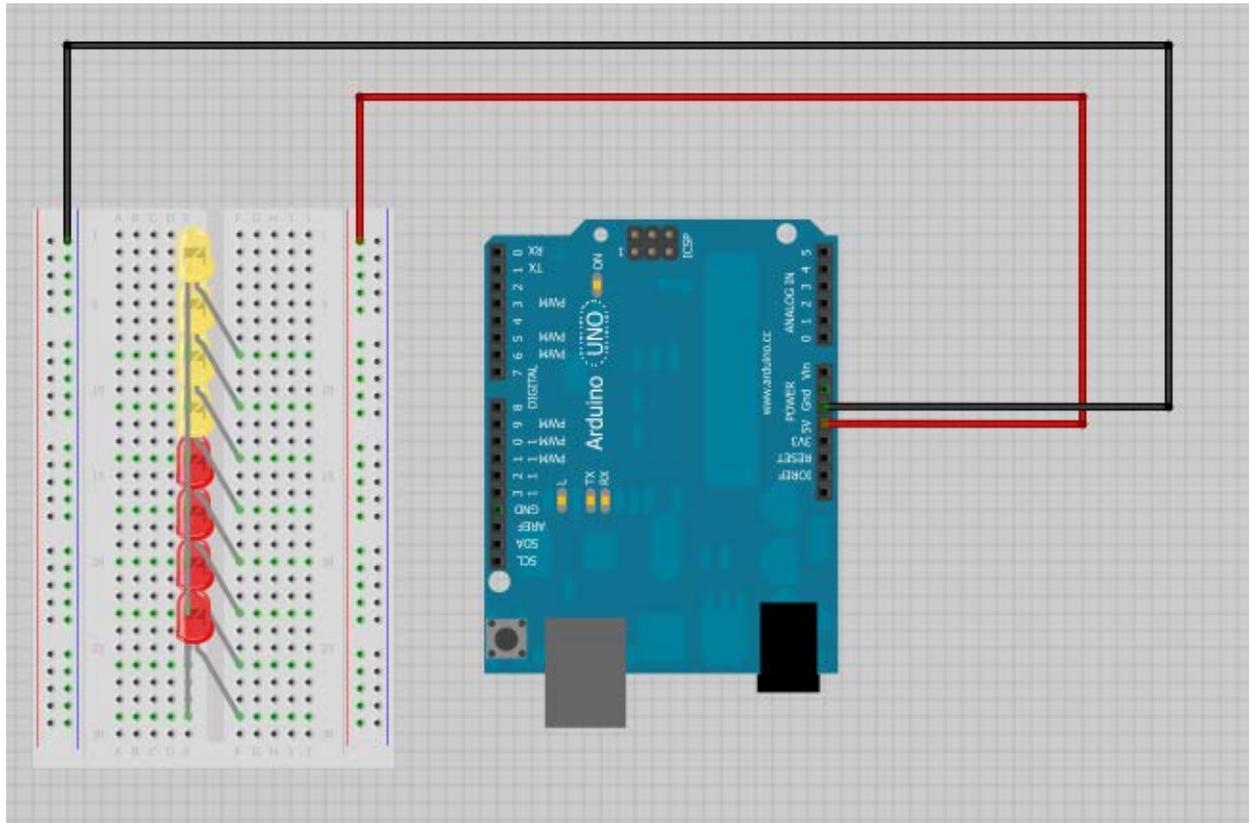
3. Place a 330 Ohm resister on each LED connecting to ground.

4. Connect Pins 2, 3, 4, 5, 6, 7, 8, 9 to the LED Pins with white or light colored wires.

5. You are done! Move to the next section to program the Arduino Board to light the row of lights.
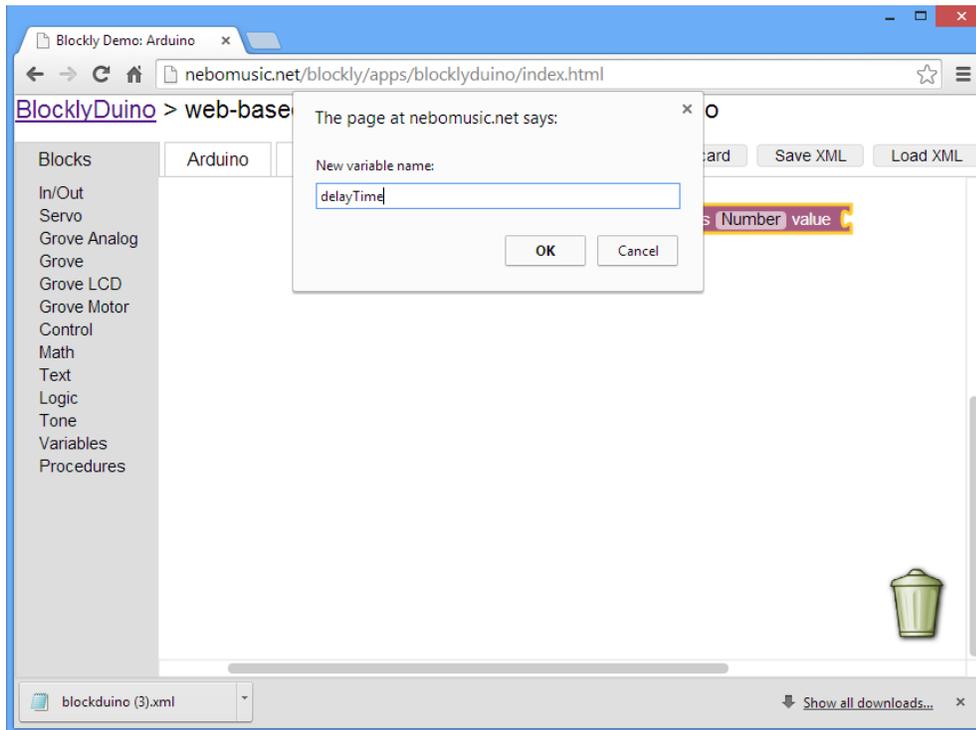
Blockly Programming:

1. Go to the website: http://nebomusic.net/blockly/apps/blocklyduino/index.html

2. Delete any code that is in the block editor.

3. We will start by declaring a variable that will represent the delay time. Click on Variables and drag a 'Declare' block to the programming area.
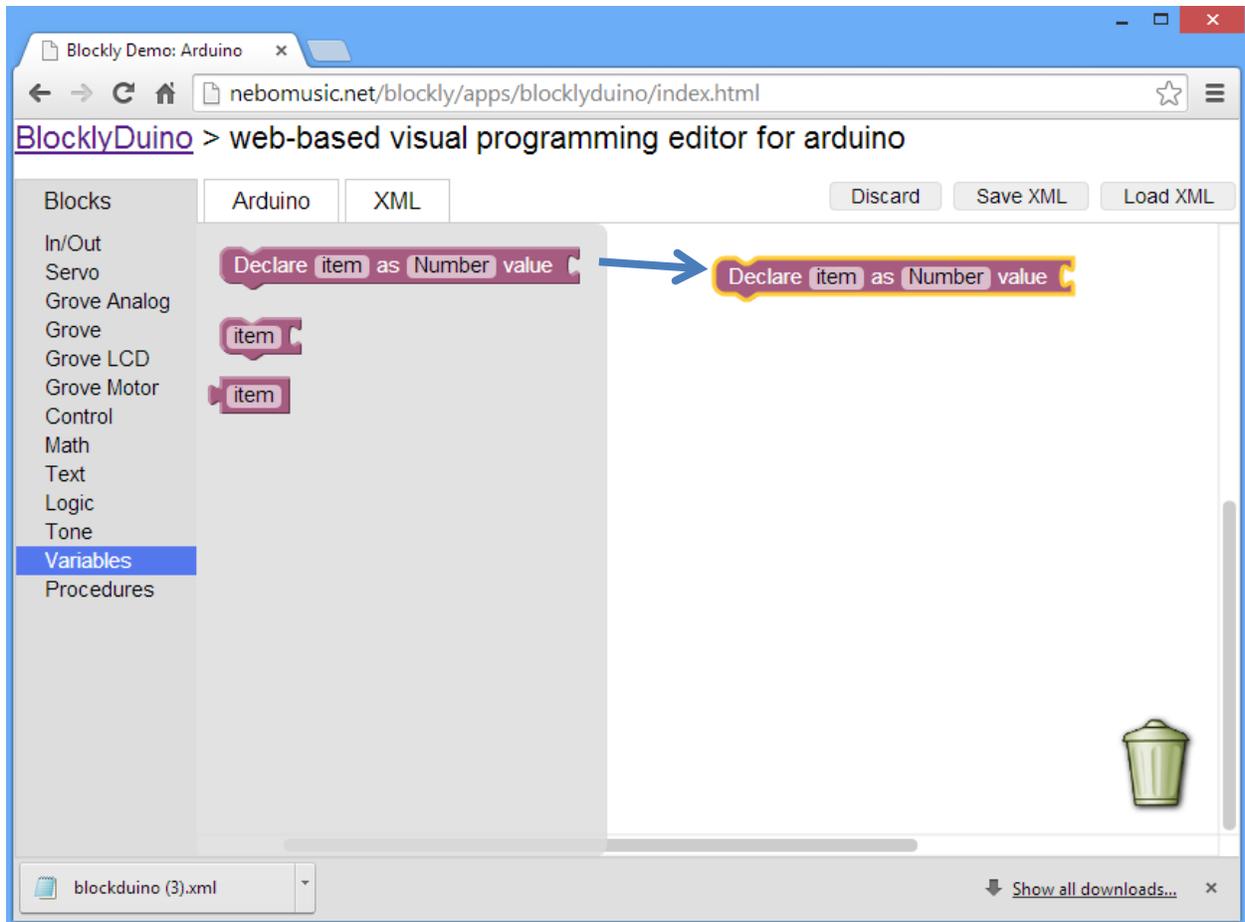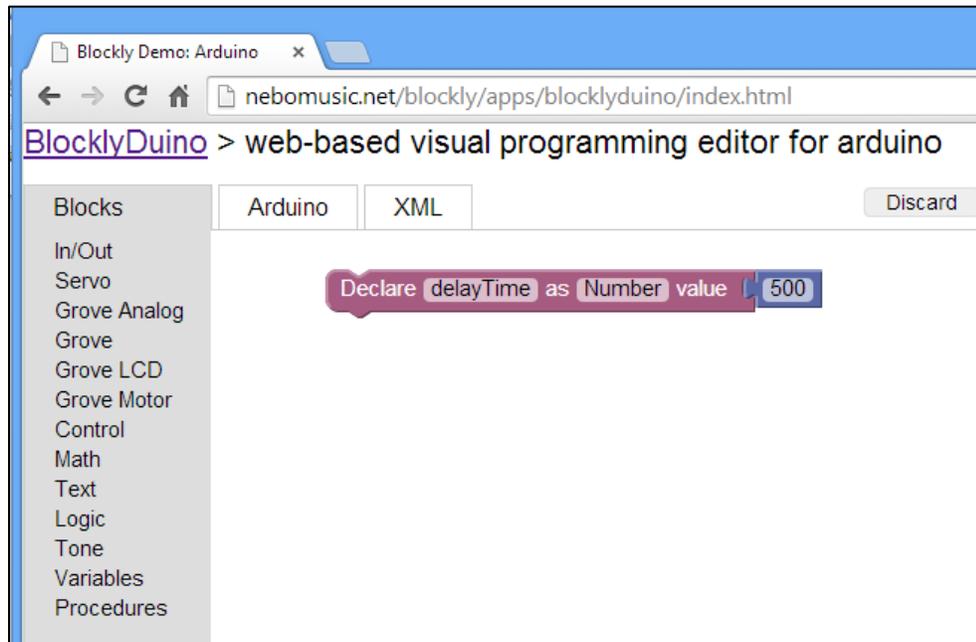

4. Click on 'item' and select 'New variable'
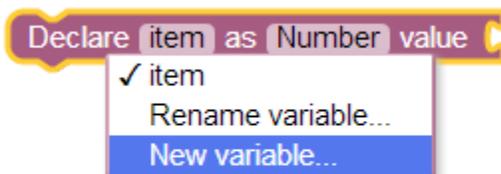
5. Name the variable 'delayTime' and click OK.

6. Place a number value 500 in the value socket.

7. We will now define a procedure to turn the LEDs on one at a time. Drag a procedure block to the programming area and name the procedure 'blinkRowOn'

BlocklyDuino > web-based visual programming editor for arduino

| Blocks | Arduino | XML |

In/Out
Servo
Grove Analog
Grove
Grove LCD
Grove Motor
Control
Math
Text
Logic
Tone
Variables
Procedures

Declare delayTime as Number value 500

blinkRowOn
do

8. Like the LED blink project, drag a 'DigitalWrite PIN#' block and a delay block and place it inside the 'blinkRowOn' procedure. Change the PIN# to 2. (The first LED and pin on our device.)
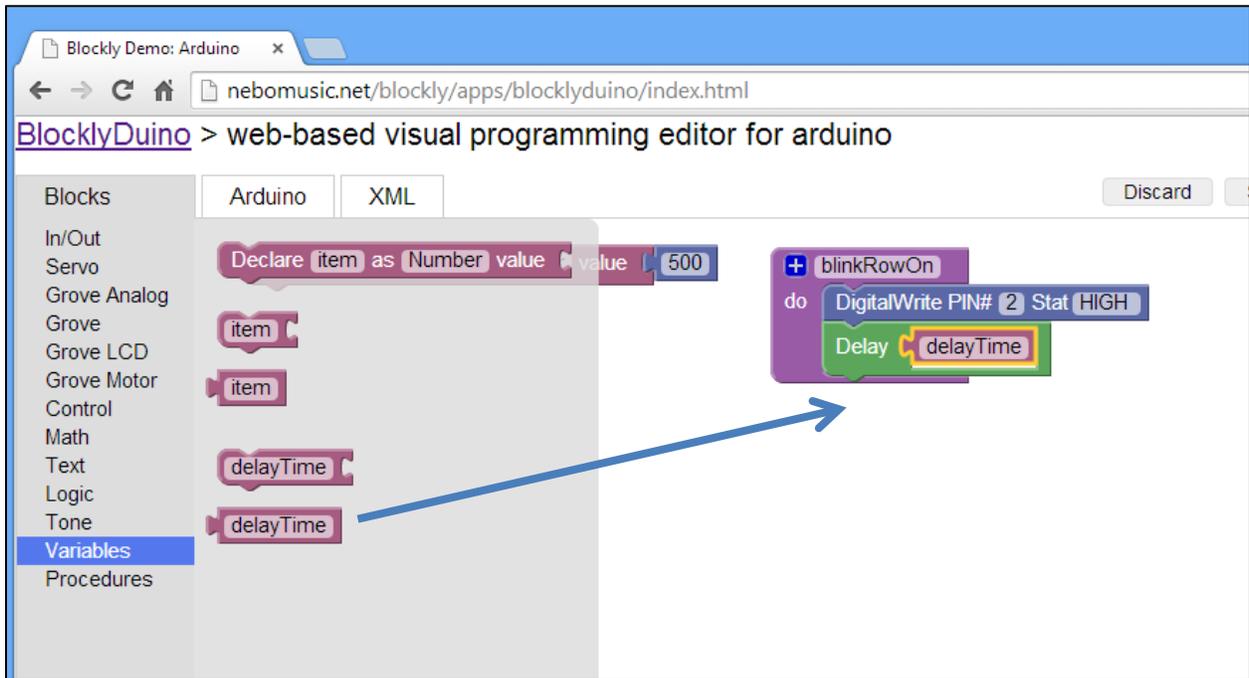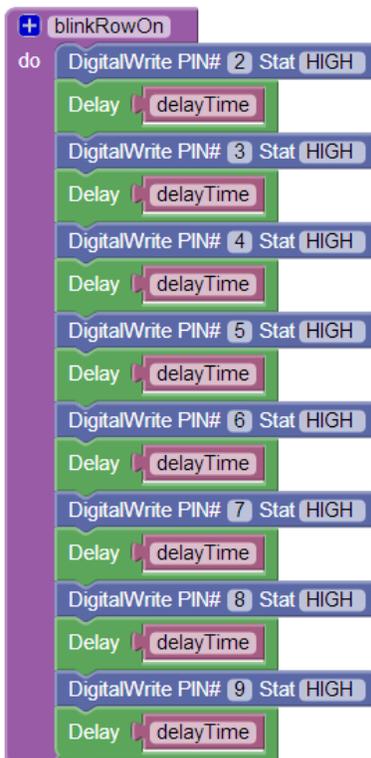
blinkRowOn
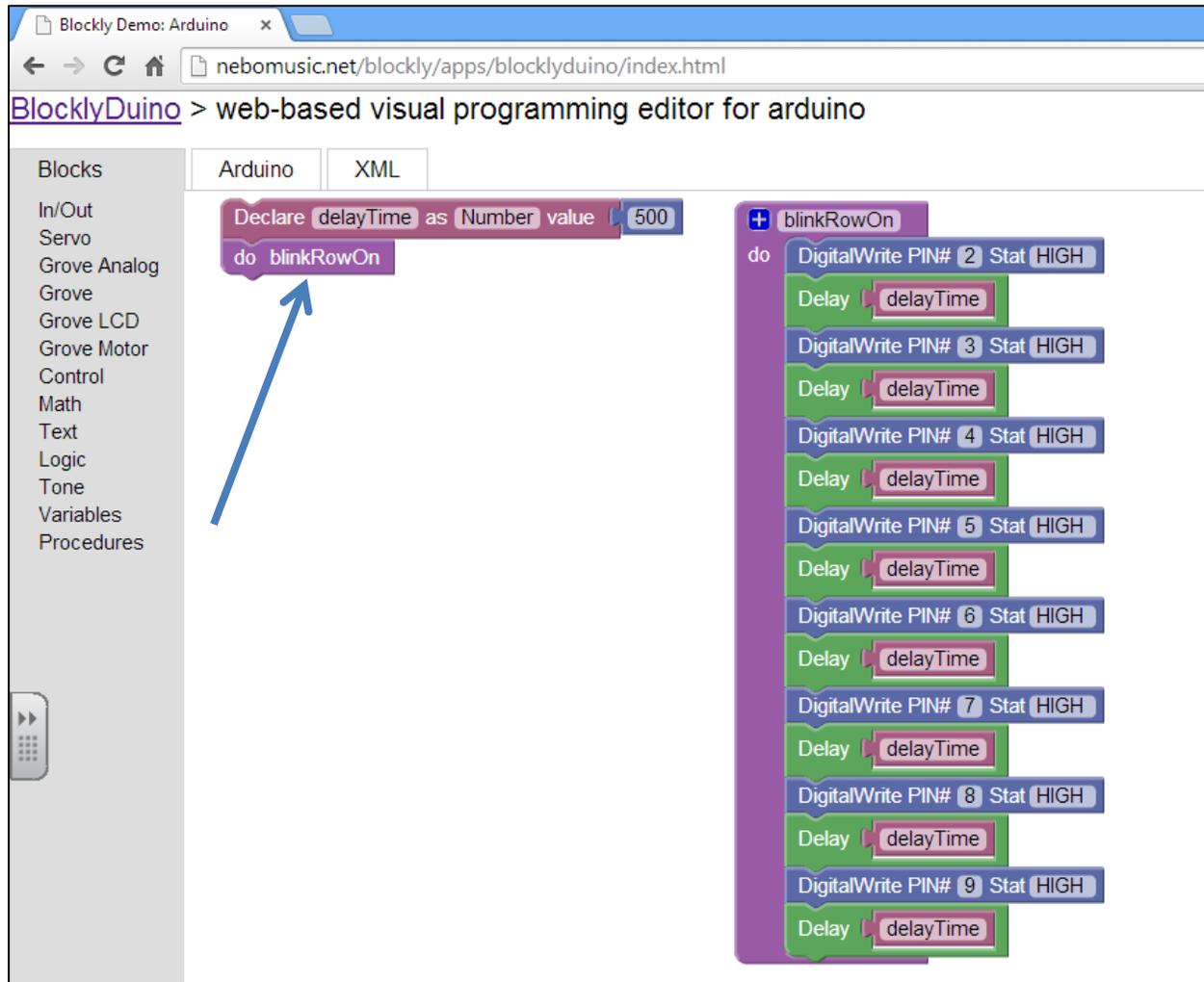do   DigitalWrite PIN# 2 Stat HIGH
      Delay

9. Click on 'variables' and drag a 'delayTime' value block to the 'Delay' block.

10. We will continue the pattern of 'DigitalWrite PIN#3, 4, 5, 6, 7, 8, 9' and 'Delay' to account for all the LED lights we want to switch on.

11. Click on 'Procedures' and drag a 'do blinkRowOn' block and connect it to the 'Declare' block.


12. Click on the 'Ardunio' tab and copy the code to the Arduino Sketch Program. Download the code to the Arduino and run. You should see the row of lights light up one at a time. (See steps from Project 1 for a reminder of how to copy and download the code.)

13. We now need to turn the LED lights off one at a time. Click on Procedures and drag a procedure block to the programming area. Name the block 'blinkRowOff'.

14. Think of the pattern we established for the 'blinkRowOn' procedure. For the 'blinkRowOff' we want to set all the values to 'LOW'. Here is the example:
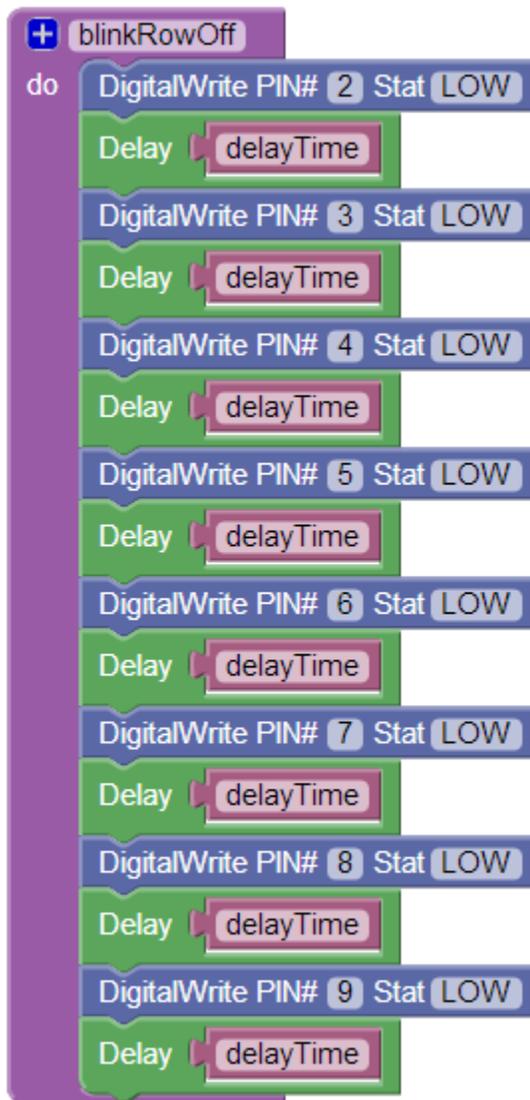
```
+ blinkRowOff
do  DigitalWrite PIN# 2 Stat LOW
    Delay  delayTime
    DigitalWrite PIN# 3 Stat LOW
    Delay  delayTime
    DigitalWrite PIN# 4 Stat LOW
    Delay  delayTime
    DigitalWrite PIN# 5 Stat LOW
    Delay  delayTime
    DigitalWrite PIN# 6 Stat LOW
    Delay  delayTime
    DigitalWrite PIN# 7 Stat LOW
    Delay  delayTime
    DigitalWrite PIN# 8 Stat LOW
    Delay  delayTime
    DigitalWrite PIN# 9 Stat LOW
    Delay  delayTime
```

15. The main block of the code would look like:
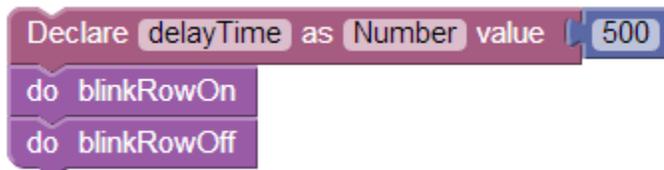
```
Declare delayTime as Number value  500
do  blinkRowOn
do  blinkRowOff
```

Other Ideas to Try:

Write functions for:
  allOn
  allOff
  alternateOn
  alternateOff
  upAndDown

Vocabulary:

Variable: Stores number or letter information in computer memory for access later across the program.