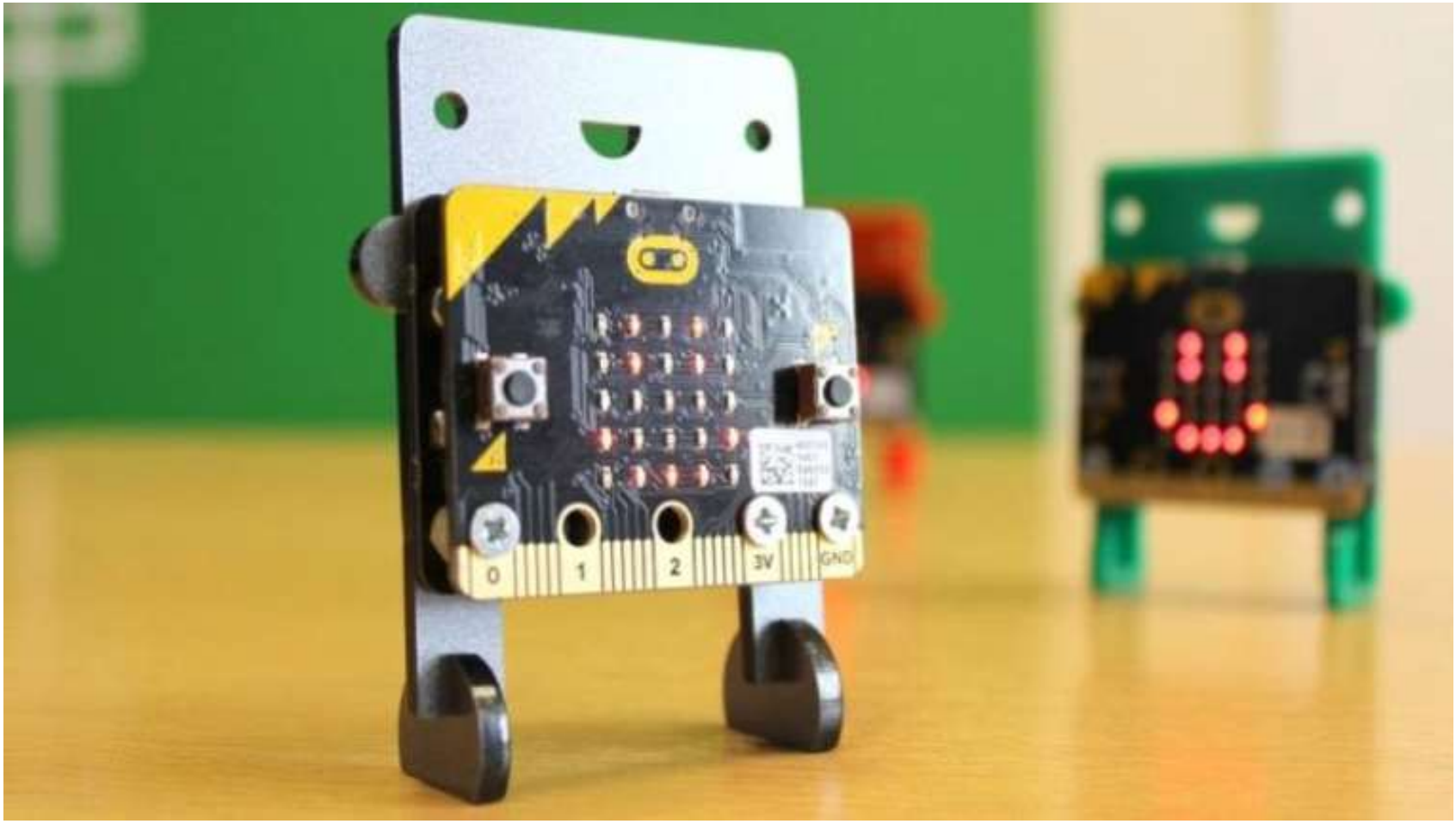


Introduction to Programming and Computer Science/Electronics

Lesson 2

Variables

Computer programs process information. Some of the information that is input, stored, and used in a computer program has a value that is **constant**, meaning it does not change throughout the course of the program. An example of a **constant** in math is 'pi' because 'pi' has one value that never changes. Other pieces of information have values that **vary** or change during the running of a program. Programmers create **variables** to hold the value of information that may change. In a game program, a variable may be created to hold the player's current score, since that value would change (hopefully!) during the course of the game.

Variables

- What pieces of information have values that don't change during the course of a single day (constants)?
- What pieces of information have values that do change during the course of a single day (variables)

Constants and variables can be numbers and/or text.

Variables

Examples

In one school day...

- Constants: The day of the week, the year, student's name, the school's address
- Variables: The temperature/weather, the current time, the current class, whether they are standing or sitting...

Variables

Variables hold a specific type of information. The micro:bit's variables can keep track of numbers, strings, booleans, and sprites. The first time you use a variable, its type is assigned to match whatever it is holding. From that point forward, you can only change the value of that variable to another value of that same type.

- A number variable could hold numerical data such as the year, the temperature, or the degree of acceleration.
- A string variable holds a string of alphanumeric characters such as a person's name, a password, or the day of the week.
- A boolean variable has only two values: true or false. You might have certain things that happen only when the variable called gameOver is false, for example.
- A sprite is a special variable that represents a single dot on the screen and holds two separate values for the row and column the dot is currently in.

Keeping Score

Let's Play Rock, Paper, Scissors!

Keeping Score

Scorekeeper

Create a program that will be a scorekeeper for your next Rock, Paper, Scissors Game

What are the variables that are needed ?

Scorekeeper

Variables

.The number of times a player wins

.The number of times a player loses

.The number of ties

Scorekeeper

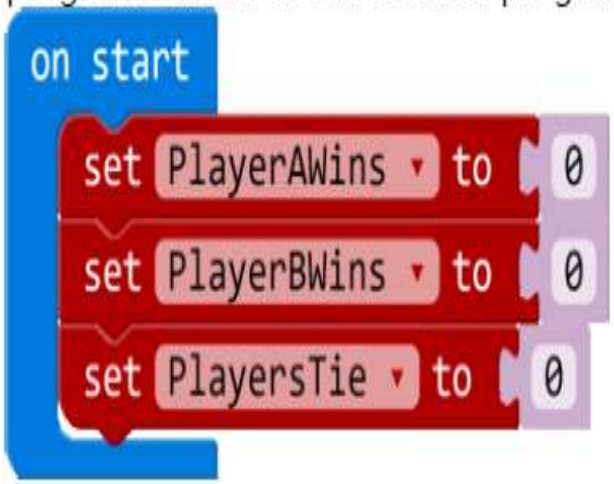
Variables
.Create and naming variables
.Create meaningful names
.PlayerAWins, AbuttonCount, PAW etc.

Scorekeeper

Scorekeeper

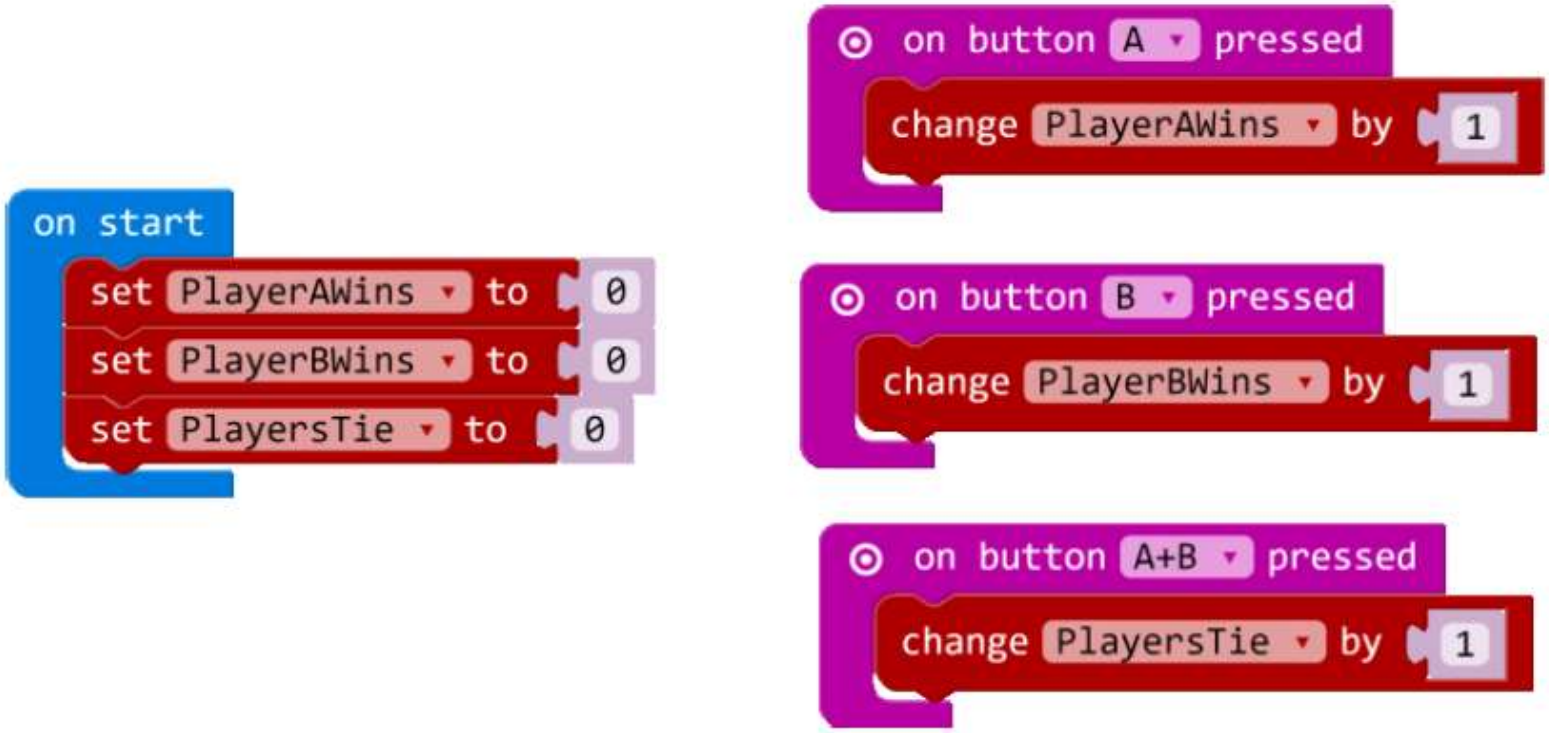
Initializing the variable value

It is important to give your variables an initial value. The initial value is the value the variable will hold each time the program starts. For our counter program, we will give each variable the value 0 (zero) at the start of the program.



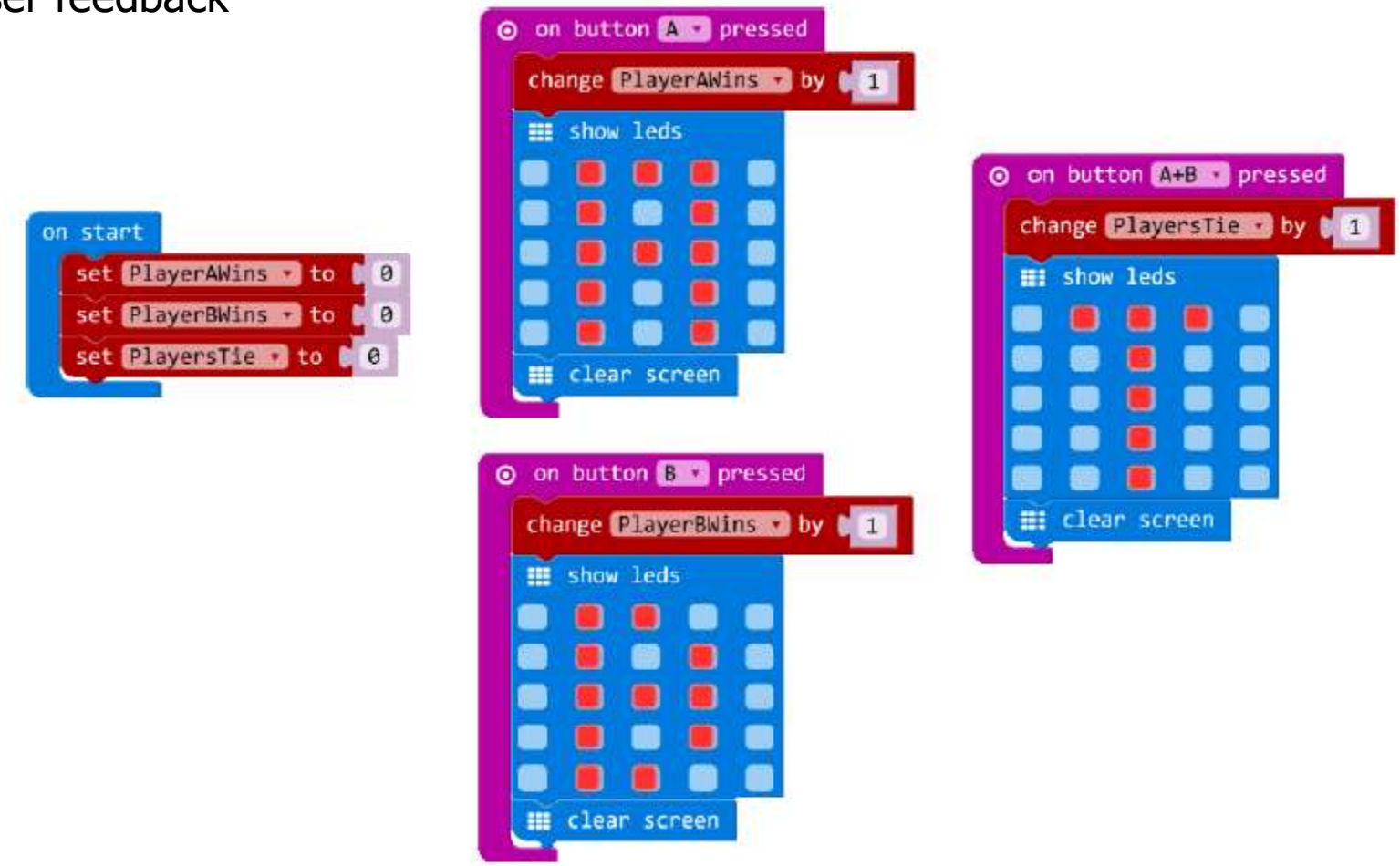
Scorekeeper

Increment by 1 when button is pressed



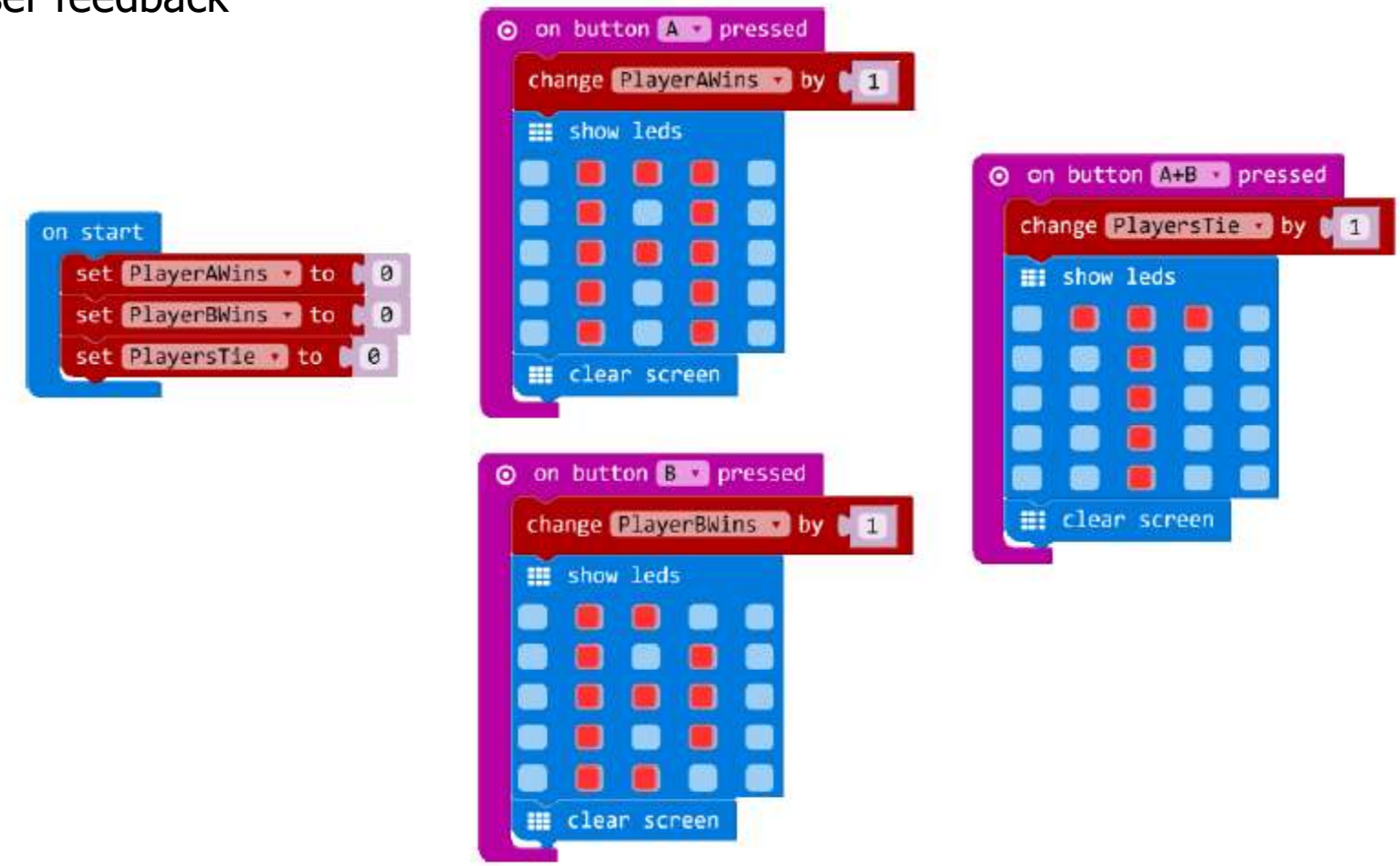
Scorekeeper

User feedback



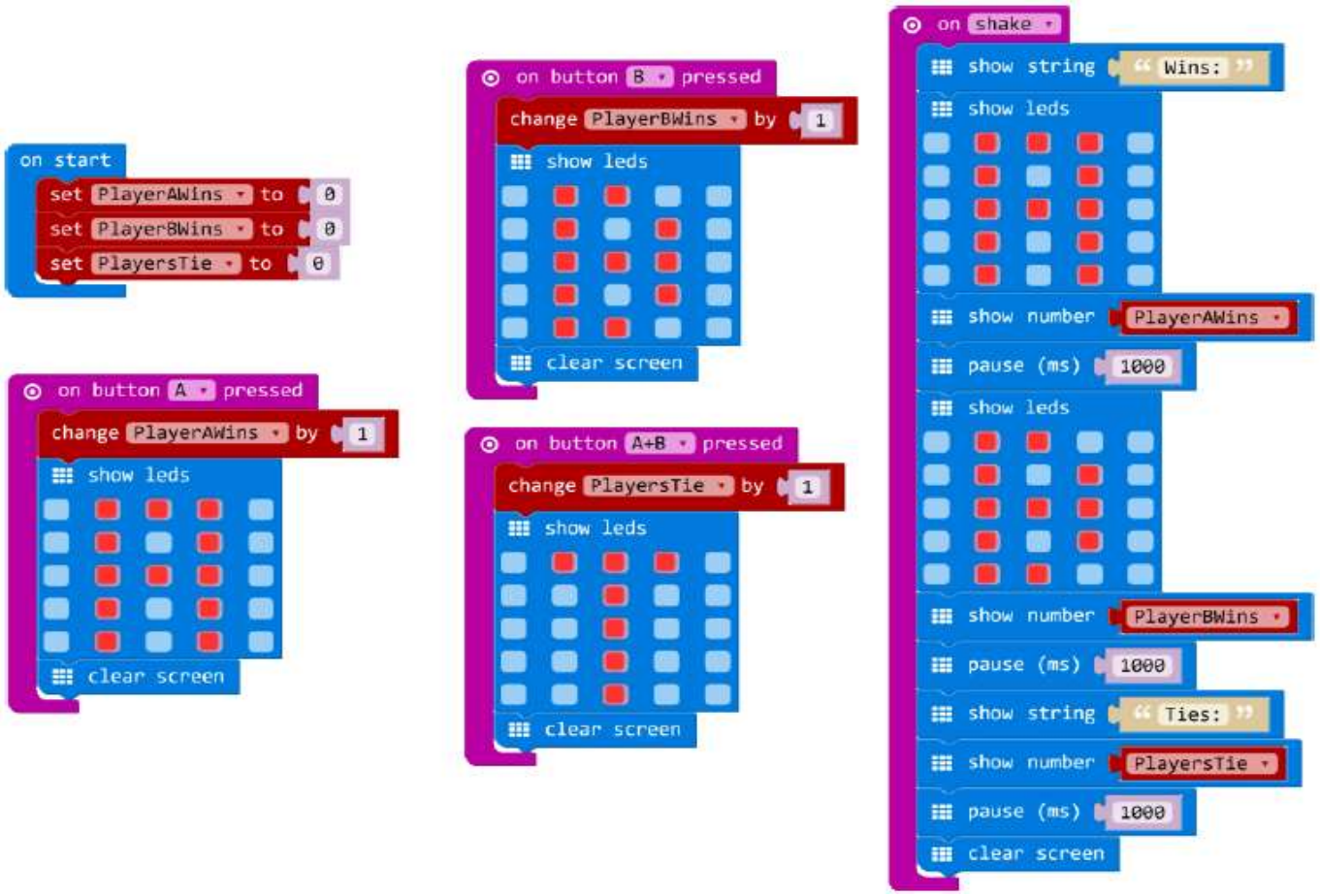
Scorekeeper

User feedback



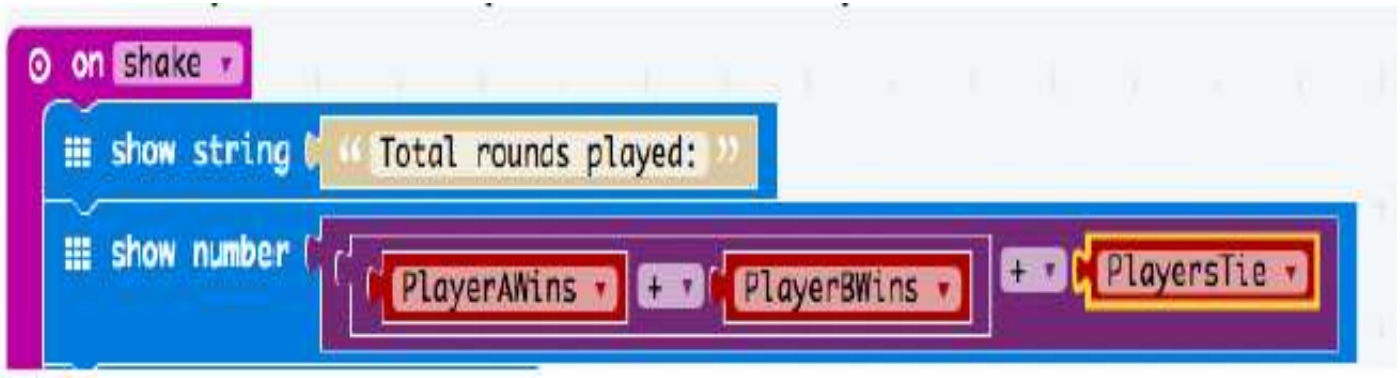
Scorekeeper

Showing final value of variables



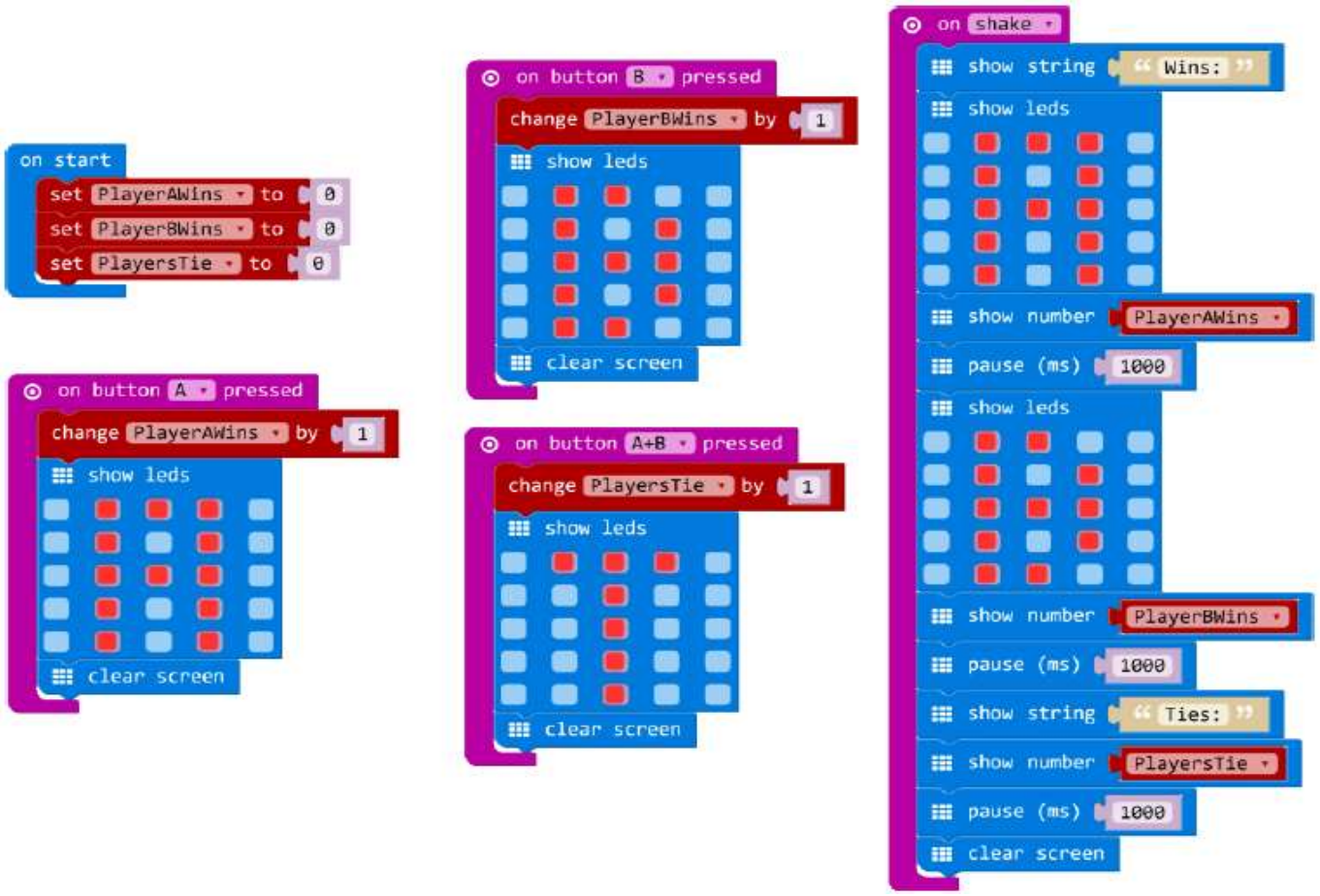
Scorekeeper

Additional Items



Scorekeeper

Showing final value of variables

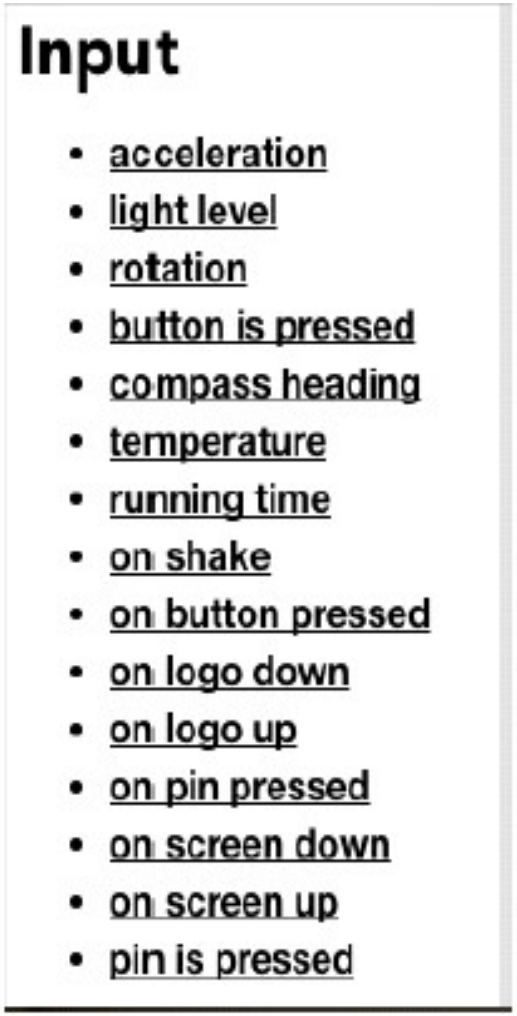


Project

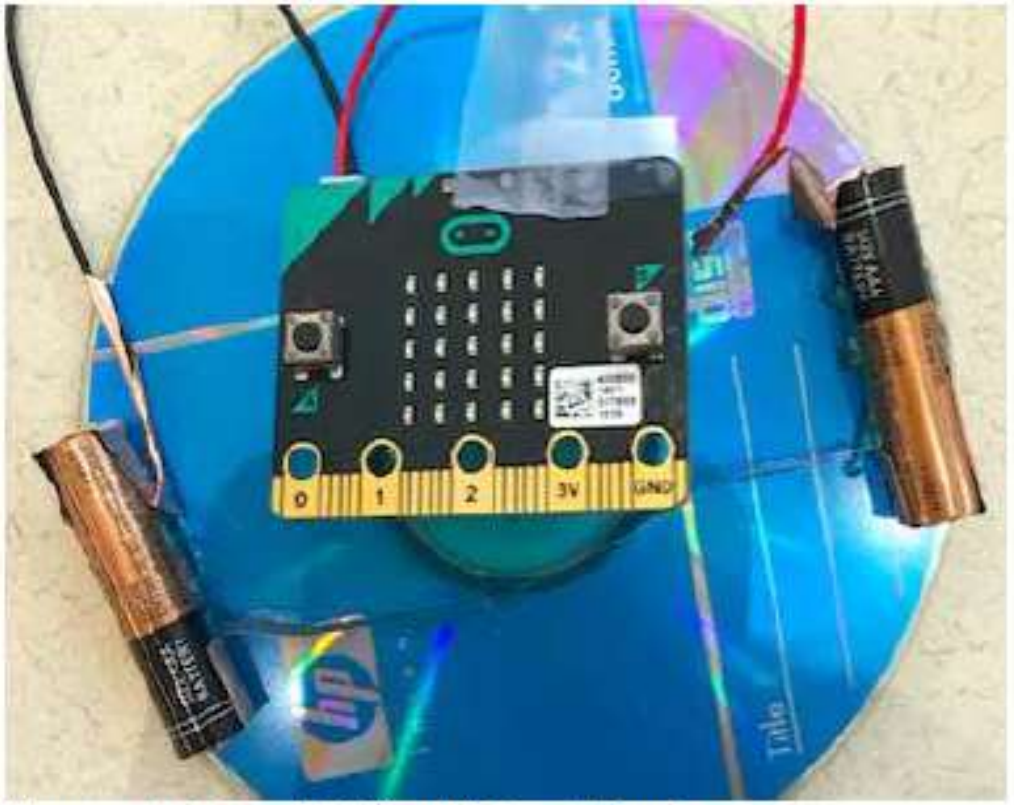
Create a

Program

That Counts Something



Project Examples



Homemade Top with Micro:bit Revolution Counter