

Robots week 4b

Lesson 6: Containers Programming Solutions

Containers

- **Containers** are global variables.
 - Can be used anywhere in the program.
 - Can be used to store (remember) numbers.
 - **Container values** are the numbers stored in the containers.
- Three basic containers: red, blue, yellow.
 - Containers found in the modifiers sub-menu.
 - Container *functions* found in the containers sub-menu.
 - Arithmetic functions (*fill container*, *add to container*)
 - Logic functions (*and/or*)
 - Can fill with values from sensors, timers, etc.

Container Wait For, Loop, and Fork

- Same as other *wait for*, *loop*, and *fork* commands.
- **Container wait for** causes the program to wait until the specified container is equal to the integer value specified.

Integer math

- Containers **ONLY** work with integers: 1,2,3,4,....
 - $3/2$ does not equal 1.5, because 1.5 is not an integer.
 - In integer math $3/2=1$.

Tasks

- The RCX can run more than one task at a time.
 - Similar to having multiple windows open on your computer.
- Tasks are independent. Every task must end with its own stop light.
 - Tasks can cause hardware conflicts.
- Start a task with a **task split** command.
- You cannot merge tasks, you can only merge forks.

Tips

- Displaying data to the LCD panel is a common way of debugging a program.
- See presentation *I6_containers.ppt* and *I5_multi_task_timers.ppt* for programming examples.

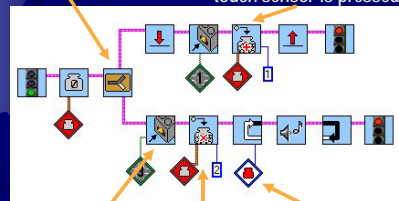
Exercise 1

This program requires 2 touch sensors. The program “remembers” how many times the first touch sensor is pressed. When the second touch sensor is pressed, it plays twice as many beeps as the number of times the first touch sensor was pressed.

Exercise 1: Solution

I used 2 tasks, one for each touch sensor.

The first task adds 1 to the container every time the first touch sensor is pressed.



When the 2nd touch sensor is pressed...

The number in the container is doubled.

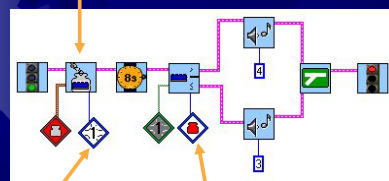
Then its value is used in the loop.

Exercise 2

When the program is started, the value of the light sensor is stored. Then, after an 8 second delay, if the light sensor reads a greater value than the value that is stored, a rising sweep sound is played. Otherwise, if the light sensor reads a value that is less than or equal to the stored value, a descending sweep sound is played.

Exercise 2: Solution

Store the light sensor's reading in the container.



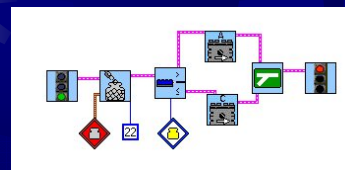
Don't forget to use the value of the sensor port.

Then use its value in the light sensor fork.

Lesson 6: Containers Troubleshooting Tips

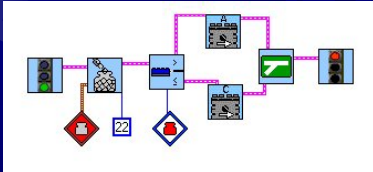
Problem 6a

This program wants to use the value of the red container, which is 22, in the light sensor fork. What's wrong?



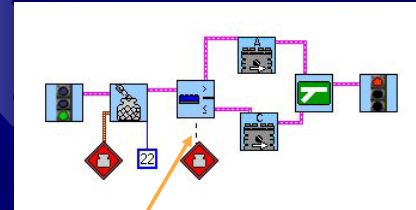
Solution 6a

The number 22 was stored in the red container, but the light sensor fork was using the value of the yellow container.



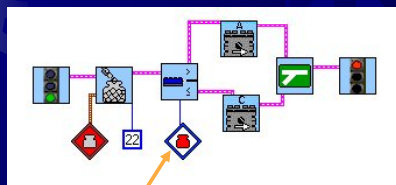
Problem 6b

Why is there a bad wire in this program?



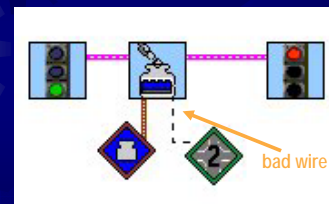
Solution 6b

Remember, forks and loops need to use the value of the container (modifier with white background).



Problem 6c

Why is there a bad wire in this program?



Solution 6c

To store a sensor value in a container, you must use the sensor port's value.

