Politecnico di Milano — Scuola di Design — A.A. 2018/2019

TECHNOLOGIES FOR CONNECTED PRODUCTS AND SYSTEMS

Hands-on number 1.

Preamble

- To gain points in the PDS evaluation, each group is required to submit a deliverable of this homework by October 9th at 23:59 on Beep. The deliverable should be submitted in the "`TCPS - Hands-on work`" folder.
- The overall weight of the homework in TCPS is 5% of the PDS evaluation.
- This homework will weigh 1% of 5%.

Deliverable format

- The deliverable you have to upload is a **single `pdf` file** containing snapshots of your Makecode program (as you can grab from the browser) together with a link to the program itself, using the link sharing functionality of Makecode.
- Please indicate, at the beginning of the pdf file, all the members of the group that participated in the homework.
- Only a deliverable sent through Beep in `pdf` form will be accepted for TCPS evaluation.
- **Deliverable naming**: the pdf file to be submitted must have a name as follows:

  ```
  handson_num_name.pdf
  ```

  where `<num>` is the number of the handson, as at the top of this page, while `<name>` must be the last name of the contact person of the group (all lower case). For example, if I had to submit a deliverable with this naming, that would be:

  ```
  handson_1_zaccaria.pdf
  ```

What you will learn in this exercise

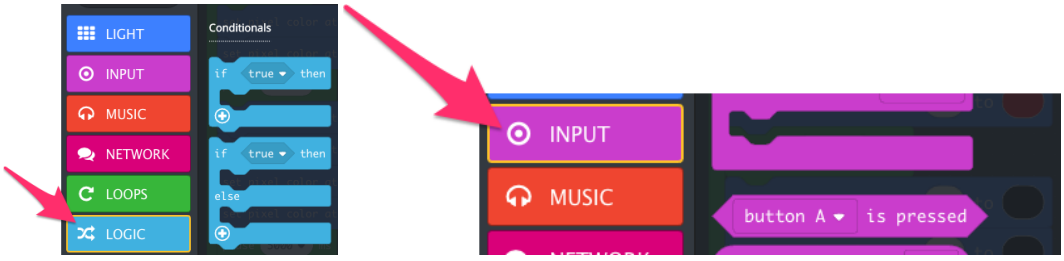
This hands-on is designed to make you work on the programming basics of the Adafruit Circuit Playground express. You will learn how to specify repetitive operations on the board by using infinite loops and other techniques.

Assignments

Assignment n. 1

- This assignment will make you acquainted with managing events coming from buttons on the board.
- Change the semaphore sketch you've already seen in order to go green only if the user presses a button, i.e., the loop should be as follows:
  1. The semaphore stays red until the user presses either button A or B
  2. When the user presses the button, the semaphore goes green
  3. After 5 seconds it goes yellow, then red again
  4. repeat from step 1.
- Once you have successfully checked in the browser, download it to run on the board.

Suggestions
Use both the "Logic" and "Input" toolbox in Makecode. Have a look at the "if-then-else" block available.



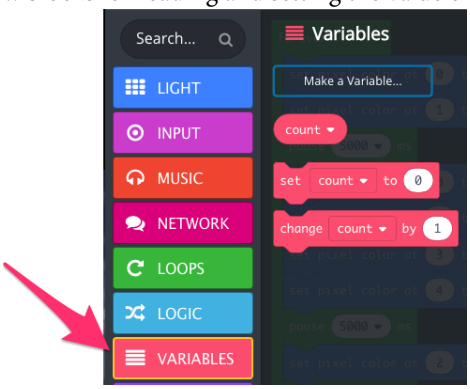
Assignment n. 2

- This assignment will make you acquainted with variables
- Start with a new sketch and create a program that counts button presses, as follows

  1. The board waits for a button (either A or B) press
  2. If the button is pressed, increment a variable counter
  3. Only if the variable counter reaches 5, emit a beep.
  4. Reset the counter and start from 1.

Suggestions

Create a variable counter in the "Variables toolbox", give it a name (e.g., `count`) and then you will be allowed to use new blocks for reading and setting the value of the variable.

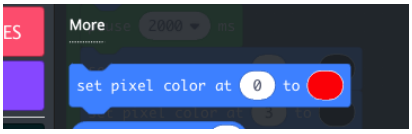


Assignment n. 3

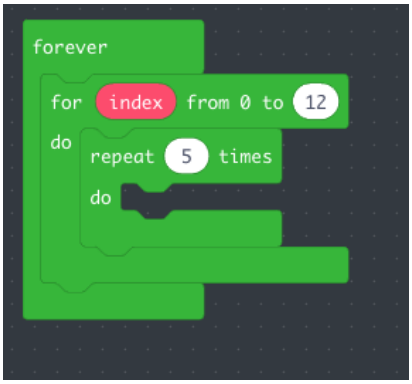
- This assignment will make you acquainted with a more complicated loops
- Make the led in position 0 flash for 5 times, then move to the next and so on. When you reach the last led, restart from the beginning.

Suggestions

- To make a particular led turn to a certain color, use the "Light" toolbox (`set pixel color at`).



- Try to nest blocks that make repeating actions easily, e.g.:


forever
for
index
from 0 to
12
do
repeat
5
times
do