June 2020

Programming 2.0

Micro:bit Sensors – Week 3

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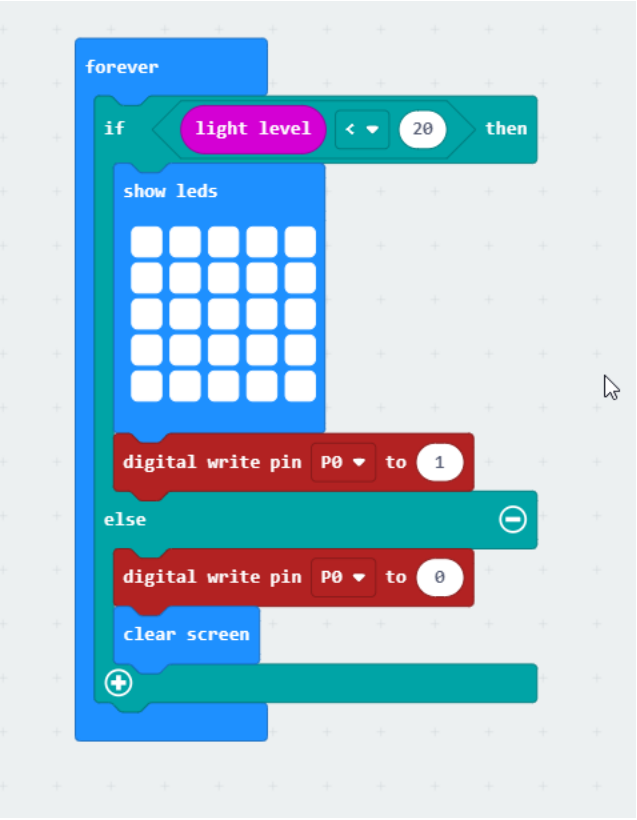
Agenda – Week 2

- Review
- Home work discussion
- Arrays example
- Variable example
- Sensors – Light
- Sensors – Temperature
- Sensors – Compass
- Review
- Homework – 2

Homework

- Light sensor
  - Father’s day – Night light for your dad

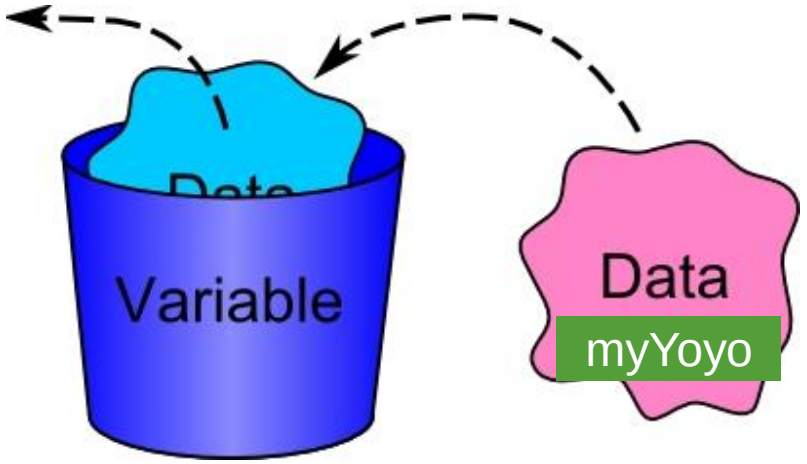


Home work 1 – Night light

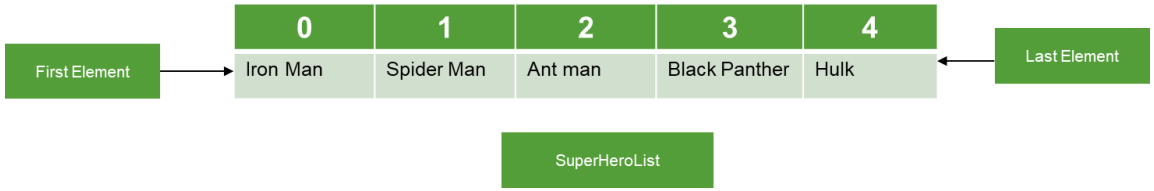
- How light sensor works?
- Watch video
- https://www.youtube.com/watch?v=TKhCr-dQMBY&t=125s

Review – Week 2 - Data

- Data is stored in computers.
- Data can be split into two parts: the name and the value
- Data types - The kind of value that a variable can hold
  - Numbers
  - Strings
  - Booleans – true/false
- Variables

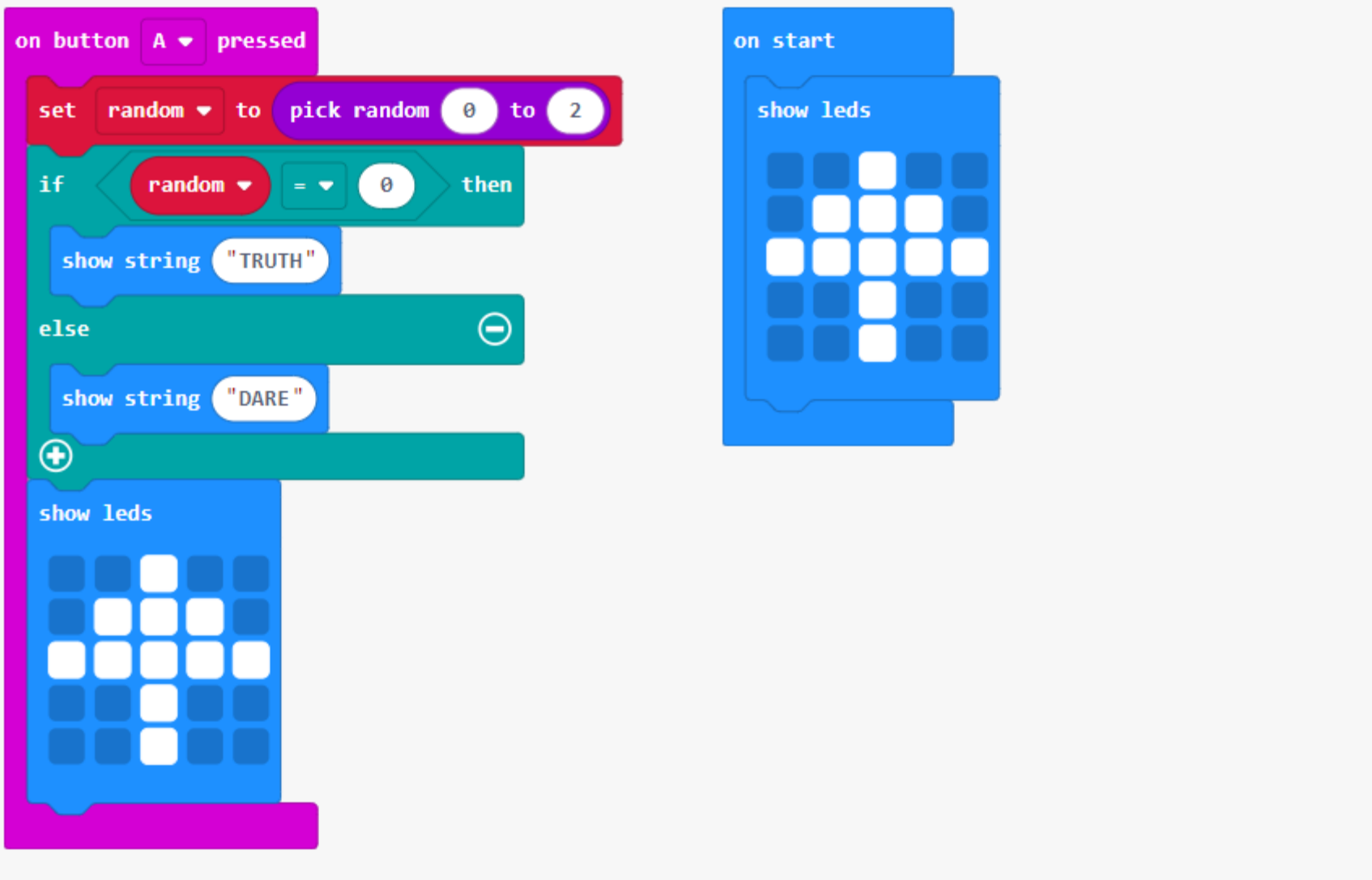


- Arrays - collection of items stored at contiguous memory locations
  - Zero-based indexing
  - Get items from any position
    - SuperHeroList[0] → Iron Man
    - SuperHeroList[4] → Hulk



- How is data is collected?
  - Light sensor
  - Temperature sensor

Truth/Dare

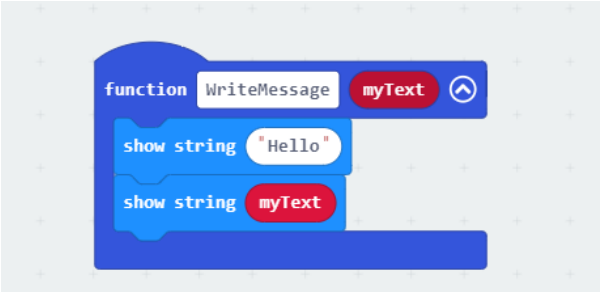

on button A pressed
set random to pick random 0 to 2
if random = 0 then
show string "TRUTH"
else
show string "DARE"
show leds
on start
show leds

Array – Activity Selector

- Activity List
  - Watch Movie
  - Read book
  - Jogging
- Length of an array
- First index
- Last index
- Activity chooser

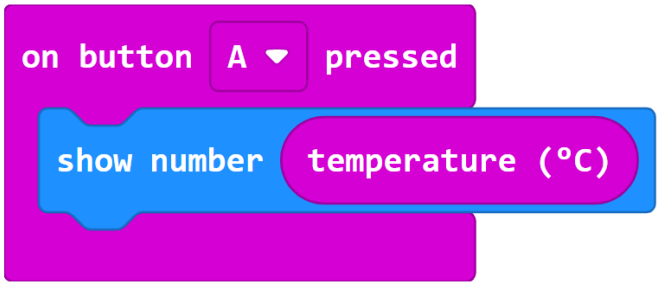
Functions

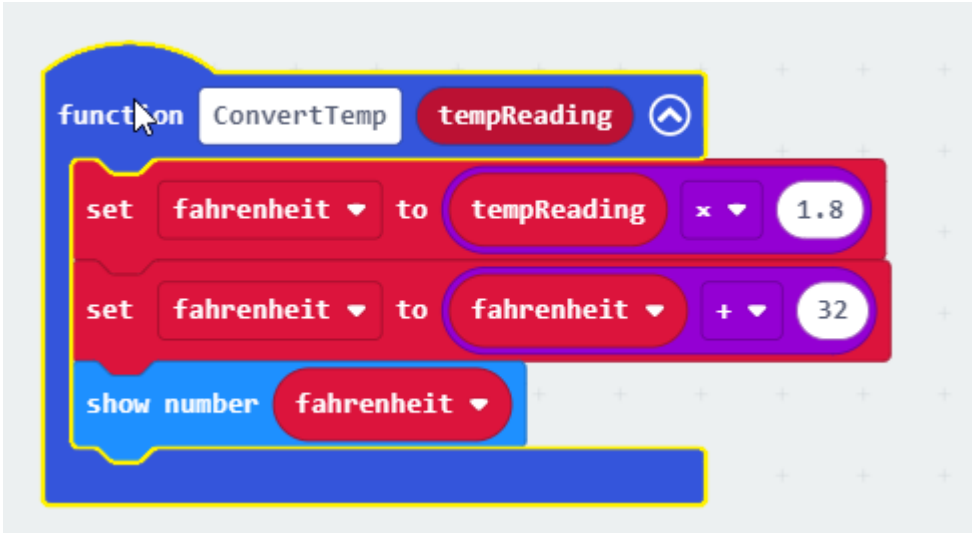
- Every programming language allows us to write some functions
- Modules of code that accomplish a specific task
- Design program as a bunch of sub-steps
- Allow us to reuse code instead of rewriting it
- All programming functions have input and output
- The function contains instructions used to create the output from its input.
- Example



Sensors

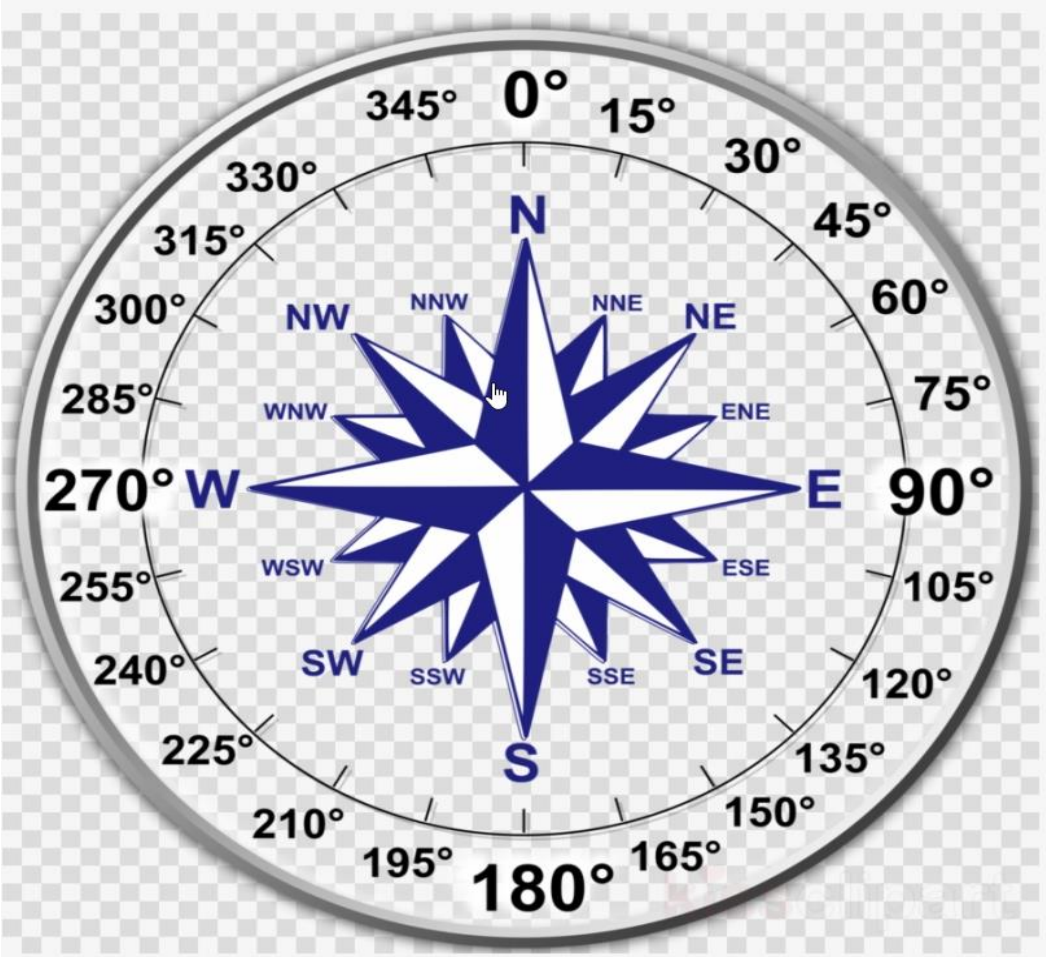
+ Temperature sensor





Sensors

+ Compass sensor




```
on button A pressed
    show number compass heading (°)
```

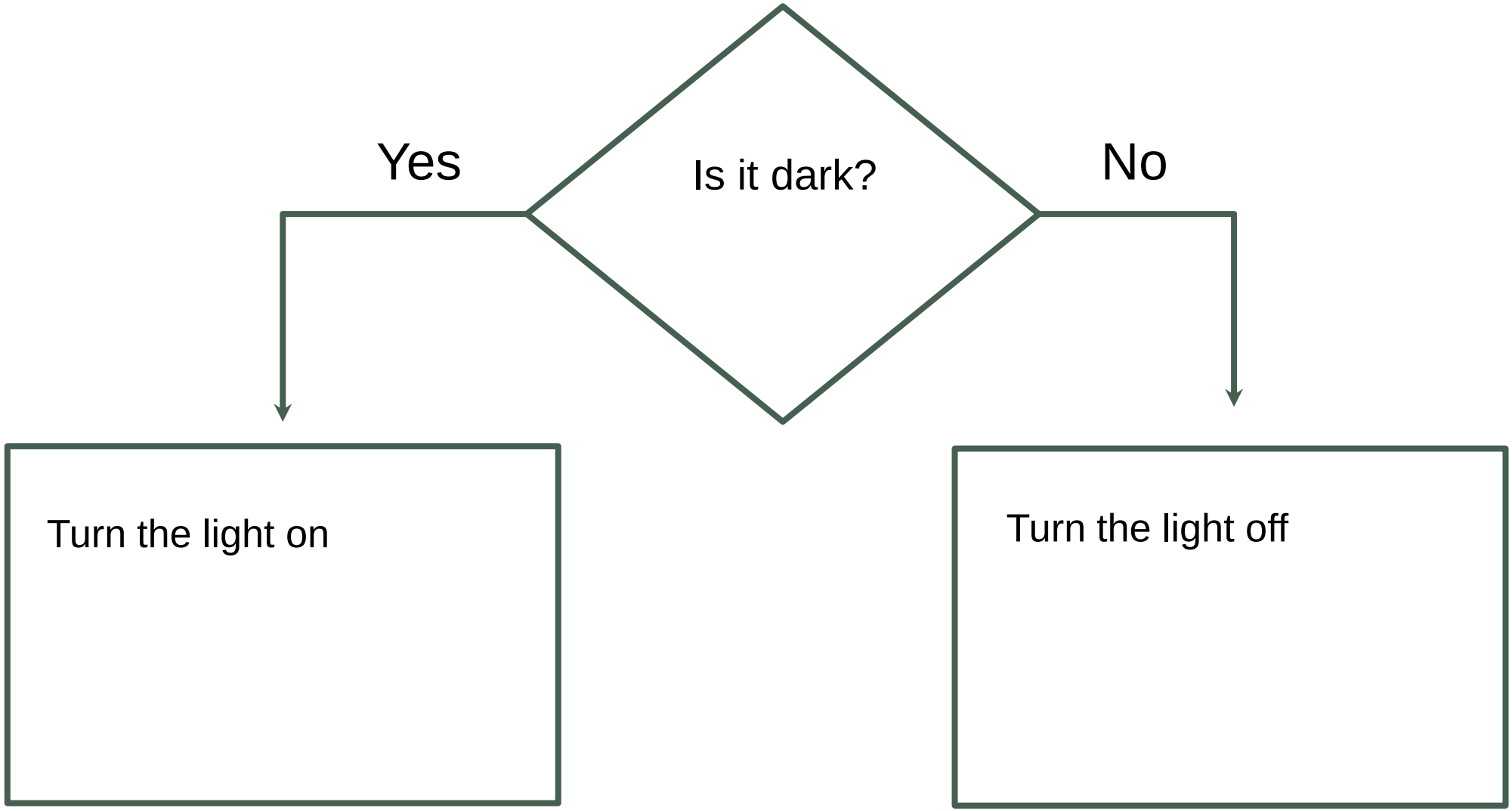
Sensors

- Compass sensor
  - If Reading < 45 → N
  - If Reading between 45 & 135 → E
  - If Reading between 135 & 225 → S
  - If Reading < between 225 & 315 → W

Review

- Data
- Data Types
- How do they collect the data?
- Sensors

Flowchart



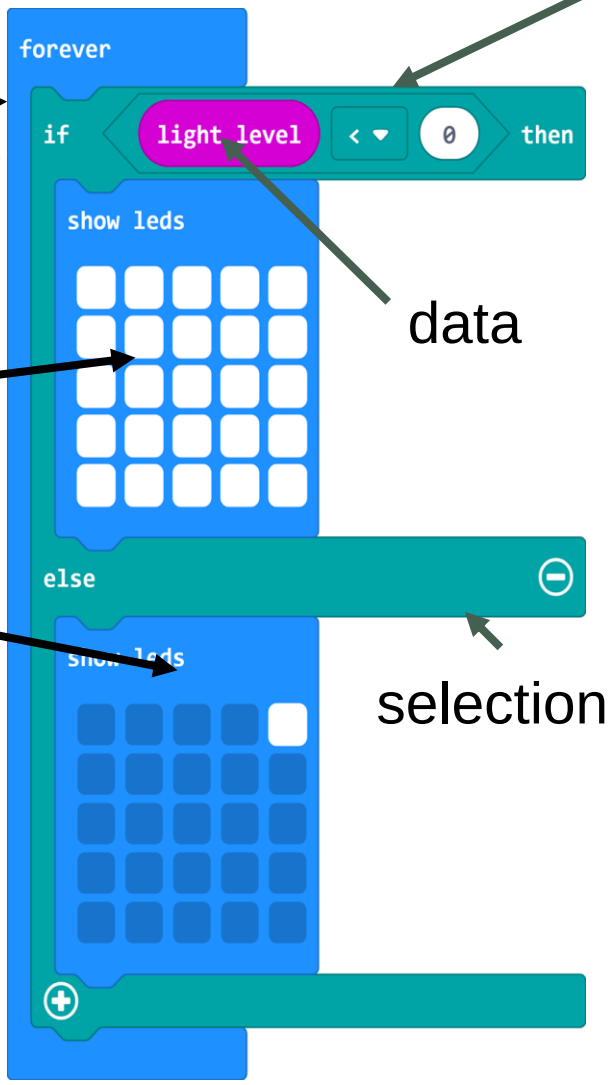
Algorithms and Programs

FOREVER

IF it is dark

THEN turn light on

ELSE turn light off



References

+ Micro:bit Educational Foundation microbit.org