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# Programming 2.0

Data – Week 2

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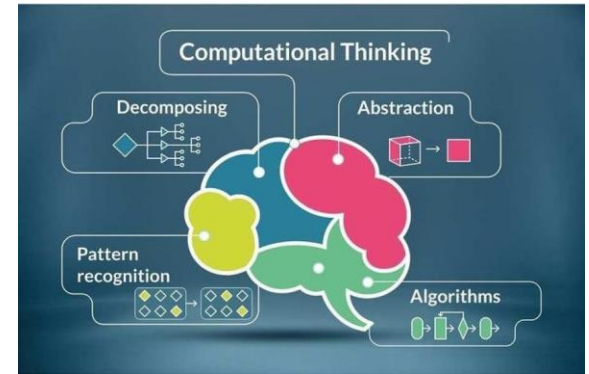
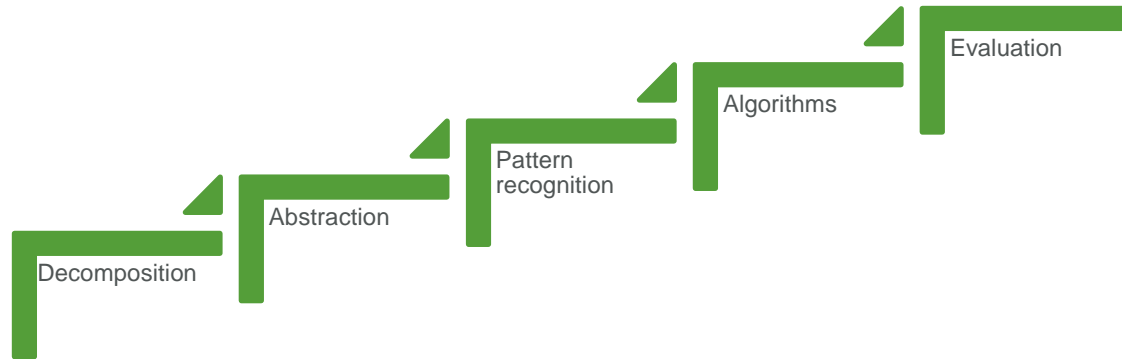
# Agenda – Week 2

- + Review
- + Home work discussion
- + Project
- + Data
- +
- + Review
- + Homework – 2



# Review – Week 1

+ Computational thinking – Considering a problem in a way that a computer can help us to solve it.



## + Programming

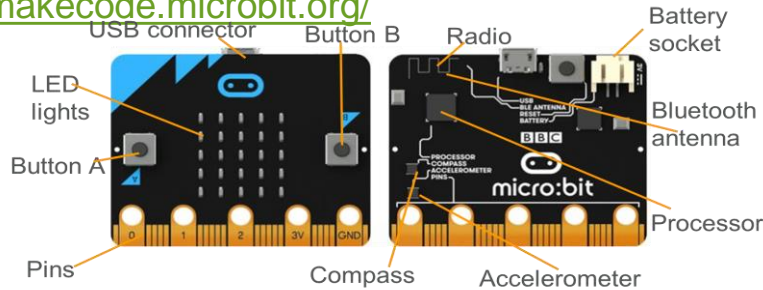
- + The process of writing computer code to create a program
- + Selection
- + Iteration

## + Micro:bit – Introduction

+ <https://makecode.microbit.org/>

```
forever
  if button B is pressed then
    repeat 3 times
      do
        play tone Low C for 1/2 beat
        pause (ms) 1000
    else
      play tone High B for 1 beat
      pause (ms) 1000
```

```
on button B pressed
  repeat 3 times
    do
      play tone Low C for 1/2 beat
      pause (ms) 1000
```

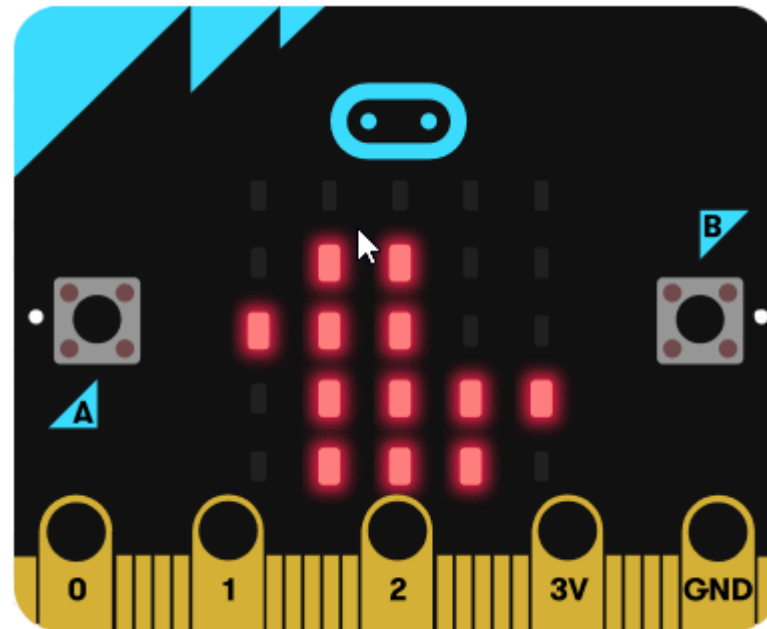
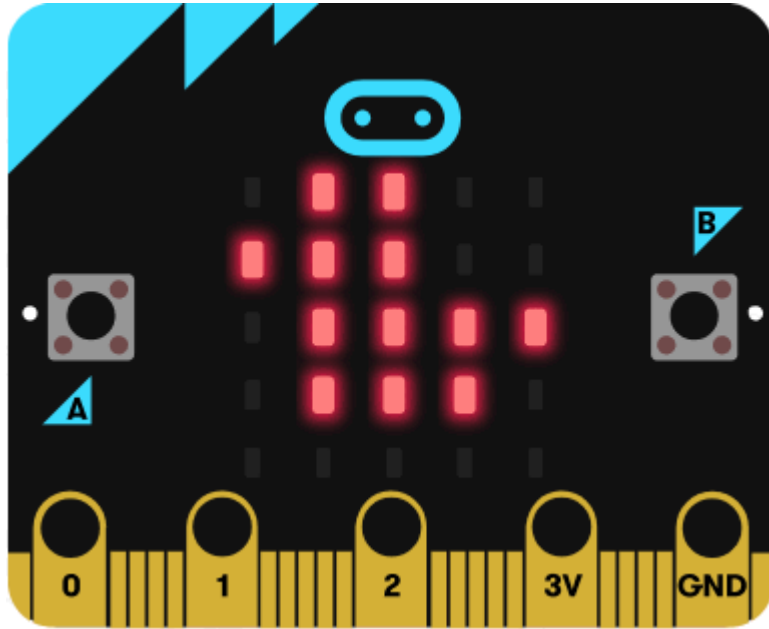


# Home work 1

Configuration	Micro:bit	Laptop
Processor	32-bit ARM Cortex M0 microprocessor (16MHz)	Intel core @2.7 Ghz
Storage	256kB Flash	1 Tb
Memory	16kB RAM	16 GB
I/O	LED, buttons	Monitor, keyboard



## Home work 2 - Animated animals



# Who am I?

first name:

last name:

favorite color:

age:

date of birth:



my photo

place of birth:

number of siblings:

favorite emoji:

home:



# Data

- + Data is stored in computers.
- + Data can be split into two parts: the name and the value
- + Data types
  - + Numbers
    - + Score
    - + Age
  - + Strings
    - + Name
    - + Place
  - + Booleans – true/false
    - + Is today is Monday?
    - + Is it hot today?
    - + Can we go out today?
    - + Is it my birthday today?



## Data name & Values - School Treasure Hunt

Data Name	Data Value
Your Name	K.T.Murphy
Year school opened	2001
Number of teachers	50
Telephone number	(203) 977-4516
Zip code	06902
Number of students	552
Length of school day	8 hours
Principal	Sherri Prendergast
Number of doors	6
Number of Photocopiers	4
School end date	06/15/2020





# Grouping the data

	Data Value
Data written in words	Your Name
	Year school opened
	Number of teachers
	Telephone number
	Zip code
	Number of students
Data written in numbers	Length of school day
	Principal
	Number of doors
	Number of Photocopiers
	School end date



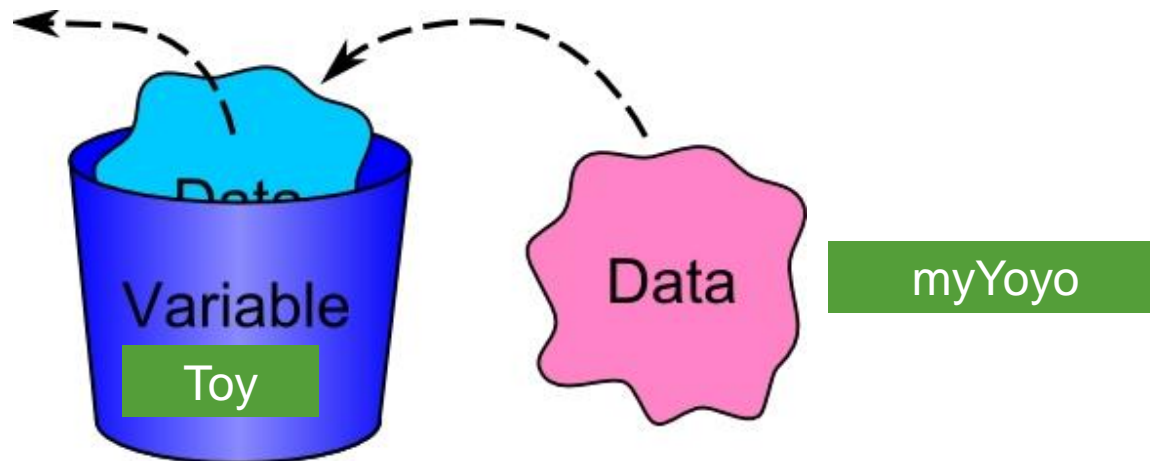
# Who has data?

	Data Value
School	
Doctor	
Online account	



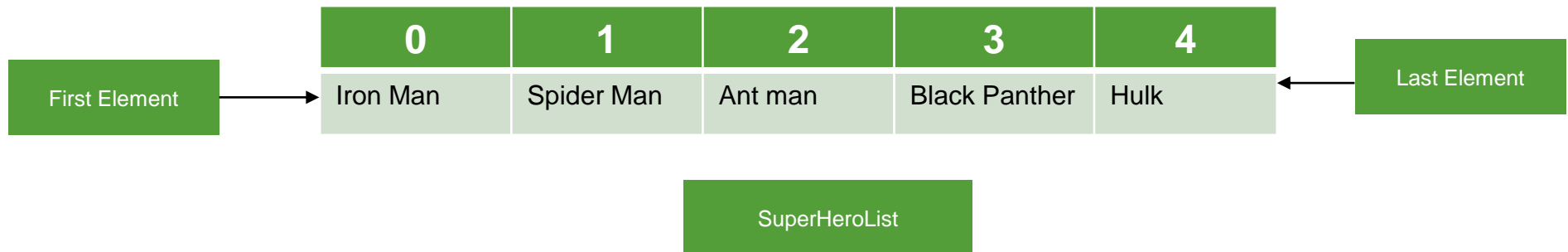
# Variables

- + Container that holds information that you can access.
  - + Bucket that contains something
- + Variable has a name and contains a value
- + A variable can store a single type of value
- + Data Type - The kind of value that a variable can hold



# Arrays

- + An array is collection of items stored at contiguous memory locations
- + Store multiple items of same type together
- + Zero-based indexing
- + Get items from any position
  - + SuperHeroList[0] → Iron Man
  - + SuperHeroList[4] → Hulk
  - + SuperHeroList[2] → ???



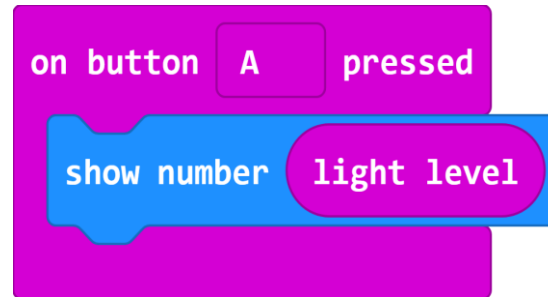
# How is your data collected?

- + Many of us have internet connected device in our homes such central heating systems, smart tv, digital assistants, etc.
- + What data might such devices be collecting?
- + How might they use this data?
- + Micro:bit – Light sensor



# Sensors

- + Sensors are devices that monitor a given thing. Temperature sensors monitor temperature.
  - + When a change is sensed in the thing it is monitoring, the sensor can make something happen
- + Micro:bit sensors



# Homework

+ Light sensor

+ Father's day – Night light for your dad



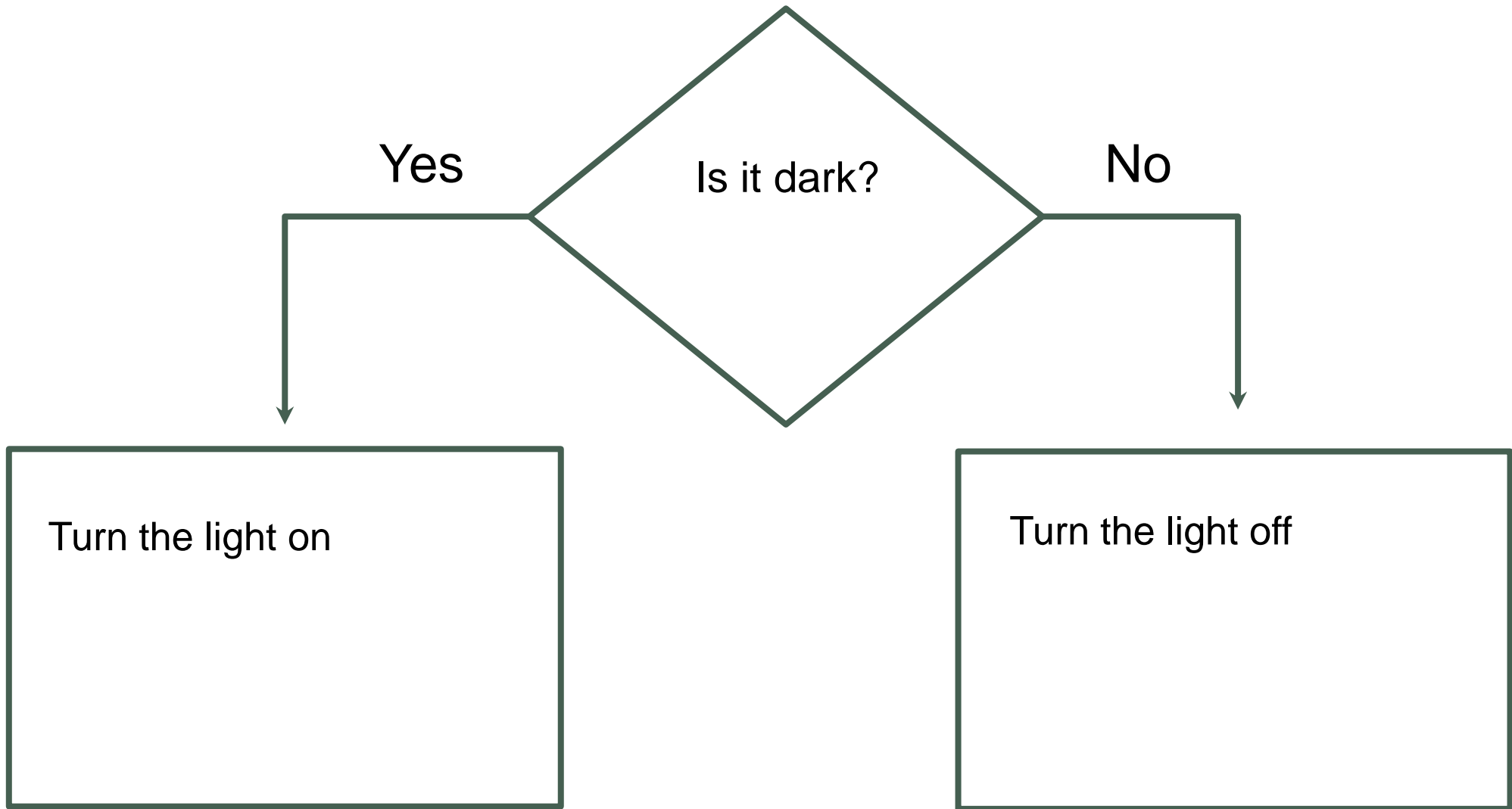
# Review

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





# Flowchart



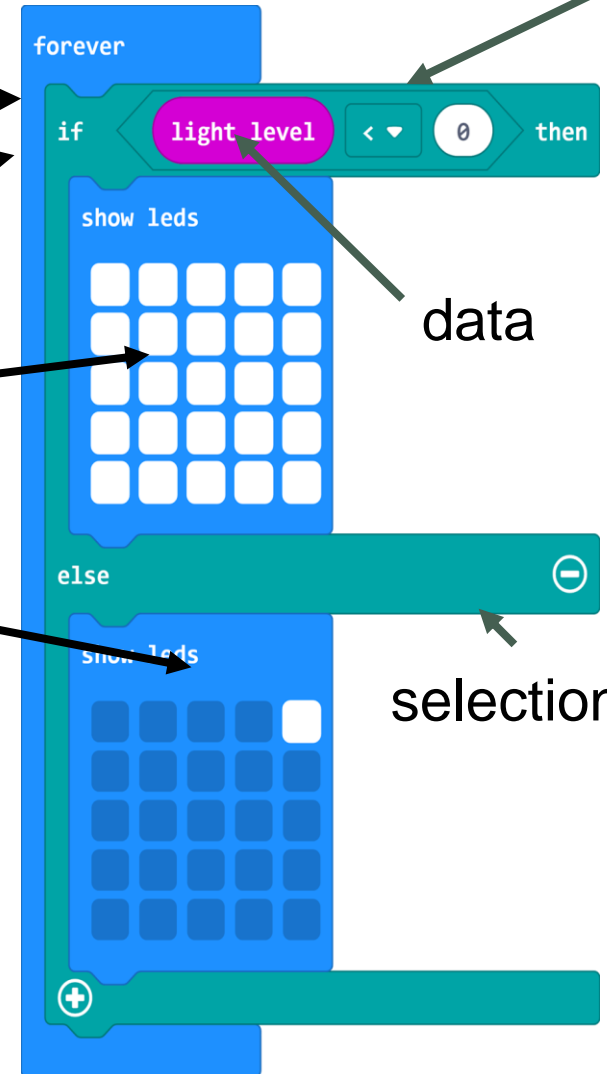
# Algorithms and Programs

**FOREVER**

**IF** it is dark

**THEN** turn light on

**ELSE** turn light off



repetition

data

selection



# References

+ Micro:bit Educational Foundation [microbit.org](https://microbit.org)

