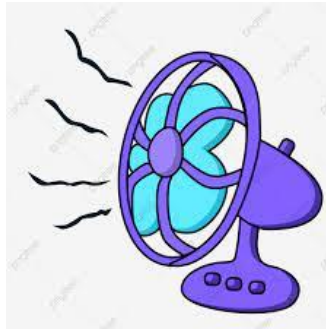


## Activity:

# Temperature Fan controller



### Description:

Modify the Temperature indicator 3 program by turning on/off a fan. The program should be able to turn either the red LED or the green LED on. If the red LED is on then turn on the fan, else if the green LED is on then turn the fan off.

### Vocabulary and Concepts:

**Variable:** An element, feature, or factor that is liable to change; in a programming language, a symbolic representation of some state or property of the program.

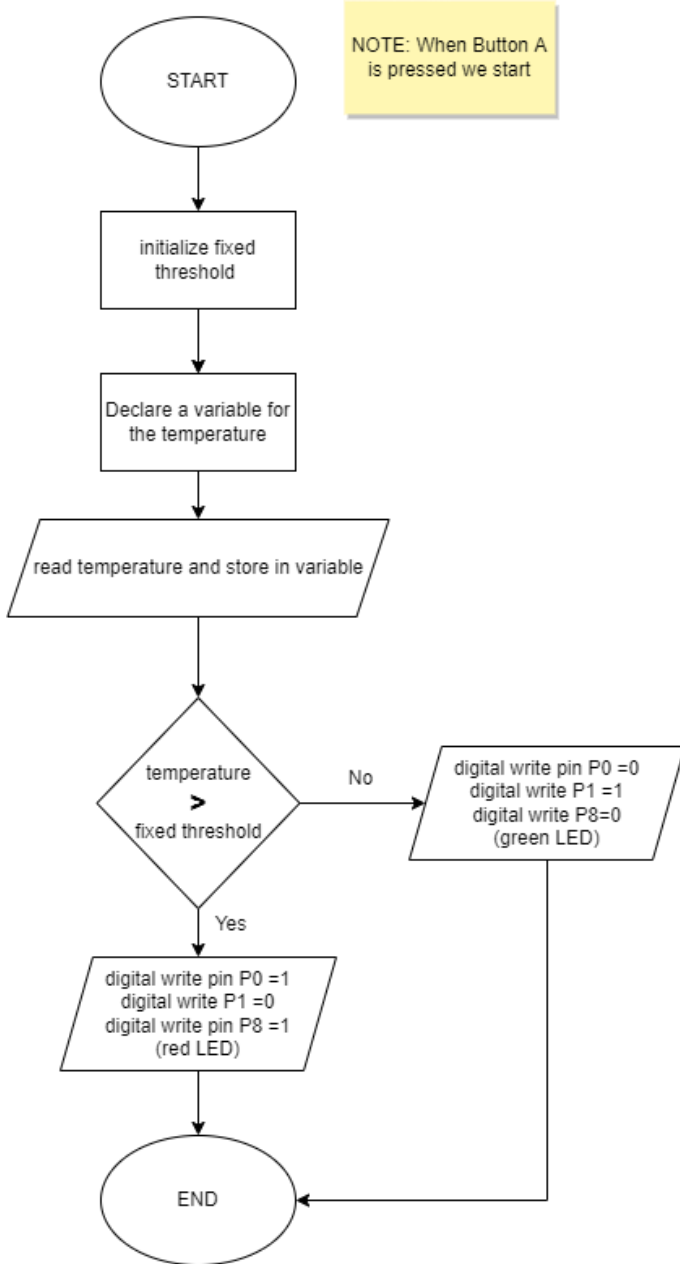
**Sensor:** An input device that reads or measures a physical property and converts it to a numerical value.

**Temperature Sensor:** a sensor that measures the temperature in degrees Celsius (scientific units)

**Control:** The power to direct the course of actions. In programming, the use of elements of programming code to direct which actions take place and the order in which they take place. A programming (code) structure that implements control. Selection (“if” statements) and loops are examples of control structures.

### Flowchart:

A flowchart is a way of representing the step-by-step process (algorithm) of your program. For this program, the flowchart is



## Build the Circuit:

### Materials Required:

- Edge I/O Adapter for micro:bit
- Micro:bit battery pack **(2xAA or 2xAAA)**
- Two Crocodile clip wires
- Eight jumper wires
- 5V high/low level trigger relay
- One Crocodile clips
- DC Motor
- Fan
- Two LEDs (red and green)
- Two resistors

## Hardware Hookup:

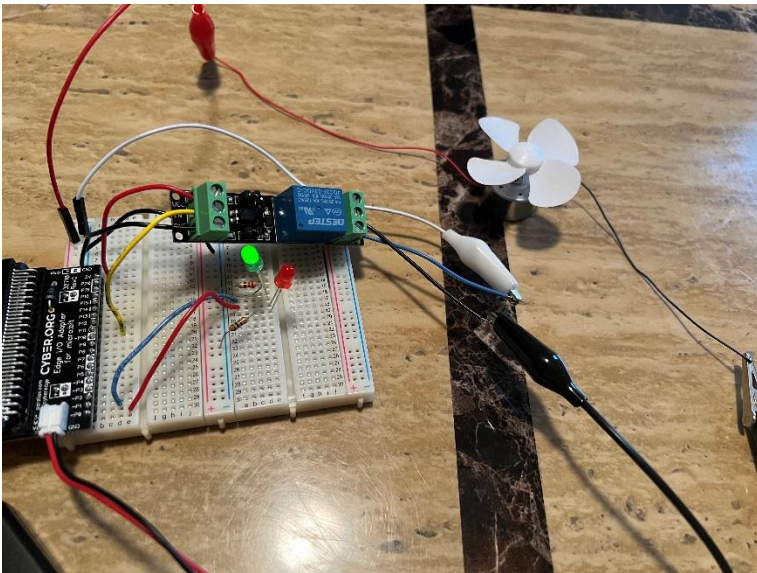
Contact from Relay	Connection to Edge I/O adapter	Jumper Wire
VCC	3V	Any color wire (ex: red)
IN	P8	Any color wire (ex: yellow)
GND	GND (blue negative line )	Any color Wire (ex: black)

Contact from Relay	Connection to fan	Jumper Wire
COM	Black crocodile clip	Any color wire (ex: black)
Black wire from COM on relay	Black wire on fan	Black crocodile clip
NO	White Crocodile clip wire	Any color wire (ex: blue)
Blue wire from NO on relay	GND (on breadboard) (blue negative line)	White crocodile clip
Not on relay (on breadboard) (red positive line)	Red wire on fan	Red crocodile clip

Contact from Edge I/O adapter	Connection to Breadboard	Connector
P0	Check instruction 1 (ex: a17)	pin wire
P1	Check instruction 2 (ex: a16)	pin wire
GND (ground)	GND (blue negative column)	pin wire
	Check instruction 3 (ex: 17e & 18e)	Red LED
	Check instruction 4 (ex: 18d & blue negative)	Resistor
	Check instruction 3 (ex: 15e & 16e)	Green LED
	Check instruction 4(ex:15d & blue negative)	Resistor

## Instructions:

- 1) Can be placed anywhere on breadboard from column a-e and row 1-30 or use example in chart.
- 2) Can be placed anywhere on breadboard except the same row as last pin wire or use example in chart.
- 3) The **longer leg(anode)** of LED must be on the same row as the pin wire and the **shorter leg(cathode)** of LED must be the same row as the resistor or use example in chart.
- 4) Must be on blue negative column and on the same as led or use example in chart.
- 5) Connect battery pack to Edge I/O adapter



# Let's Start Programming!

## Step 1: Getting Started

First, Copy Temperature Indicator 3. Once Temperature Indicator 3 is working properly, then grab another digital write pin and set pin P8 to 1 where the red light is on and green light is off. For example, if P0 represents the red LED then fan should be 1 and if P1 represents green LED then fan should be 0

```
on button A pressed
  set temp_in_C to temperature (°C)
  set temp_in_F to temp_in_C x 1.9
  set temp_in_F to temp_in_F + 32
  if temp_in_F >= 72 then
    digital write pin P0 to 1
    digital write pin P1 to 0
    digital write pin P8 to 1
  else
    digital write pin P0 to 0
    digital write pin P1 to 1
    digital write pin P8 to 0
  show number temp_in_F
```

## Step 2: Selection Changes

Certain changes can be made within the “on button pressed” block by choosing between A, B, or A+B which means we can determine if we would like to change the temperature when button A is pressed on the microbit, button B, or Both buttons with A+B. The threshold value can also be changed by entering a number in the text box.

## Step 3: Test your Program using the Emulator

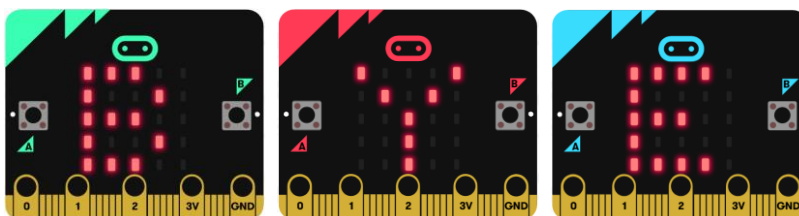
## Step 4: Download the Program

## Step 5: Connect to your micro:bit

## Step 6: Running the Program on the micro:bit

# Congratulations!

**You have created your Fan Controller program!!**



References

Flowchart tool: <https://www.draw.io/>