Activity:

Temperature Fan controller

Diagram

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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 you

program. For this program, the flowchart is

A picture containing polygon

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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

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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

Graphical user interface, application, chat or text message

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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

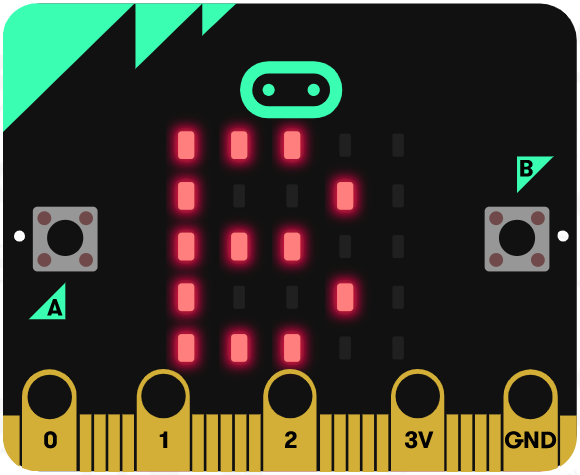
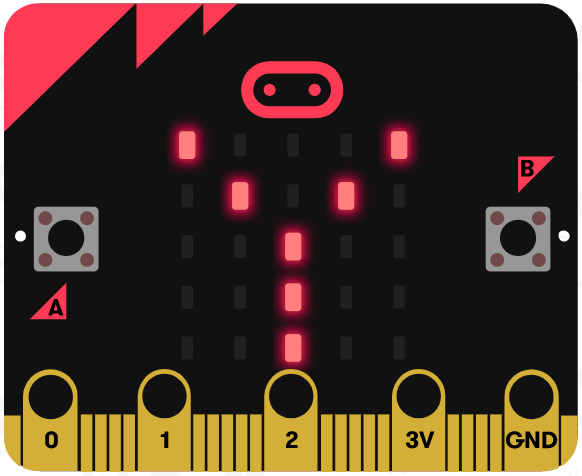
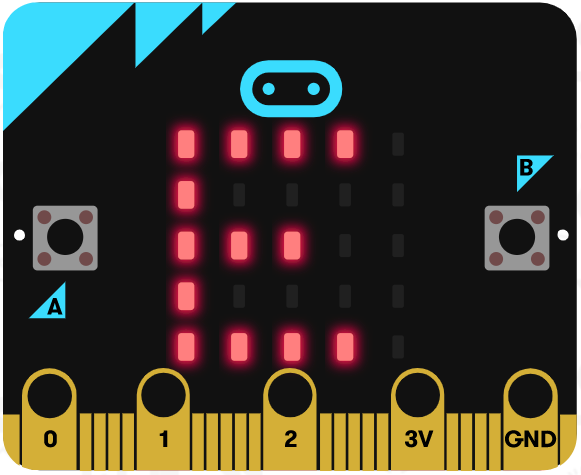
Step 4: Download the Program

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/>