CH31-C - 7 Segment Count Press

Connect a 7 Segment Display and a Push Button to a Bit Board and control them with code.

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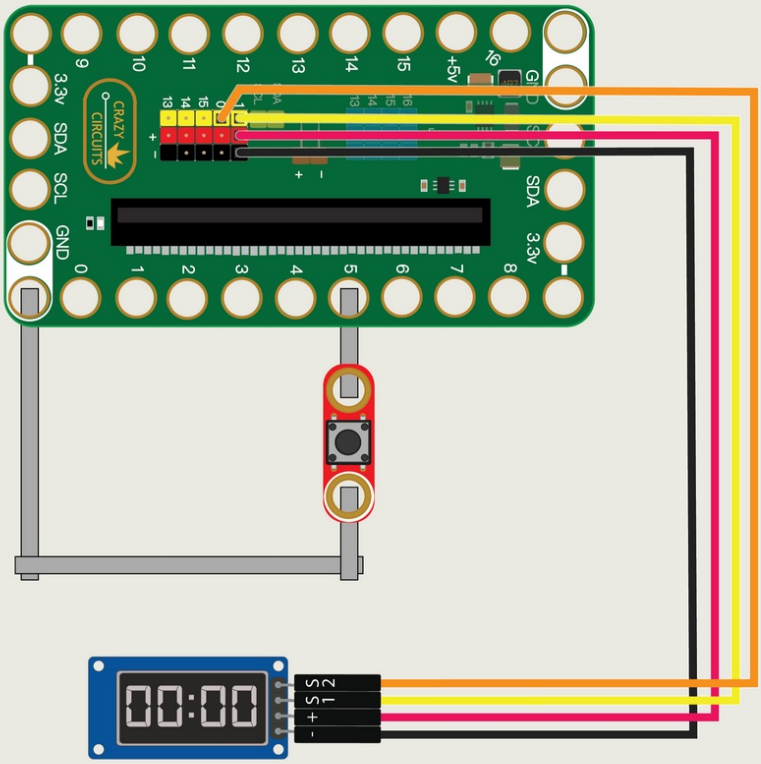


```
7SEG   Bit Board
CLK -> Pin 0 (S2)
DIO -> Pin 1 (S1)
VCC -> + (Positive) Pin
GND -> - (Negative) Pin
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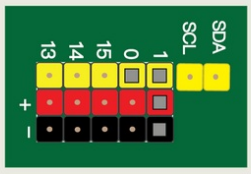


INTRODUCTION

Connect a 7 Segment Display and a Push Button to a Bit Board and control them with code.

We'll explore code to control a 7 Segment Digital Display that can show numbers up to 9999.

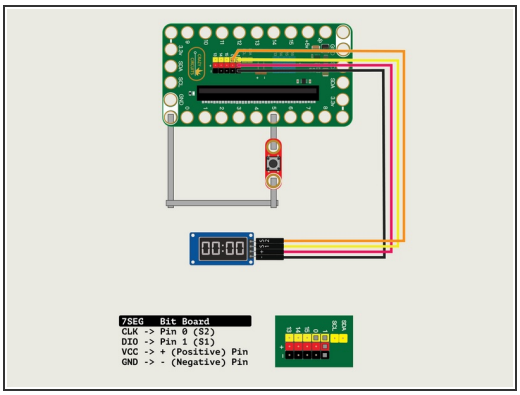
TOOLS:

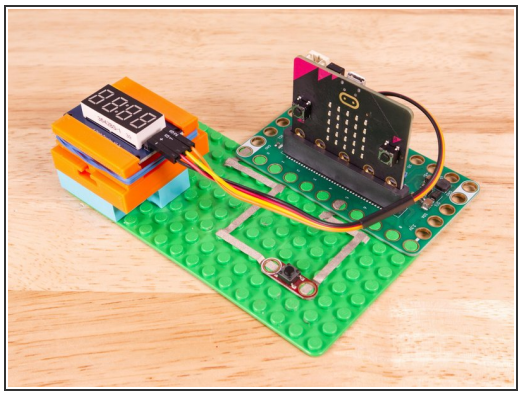
- Computer (1)
- Scissors (1)

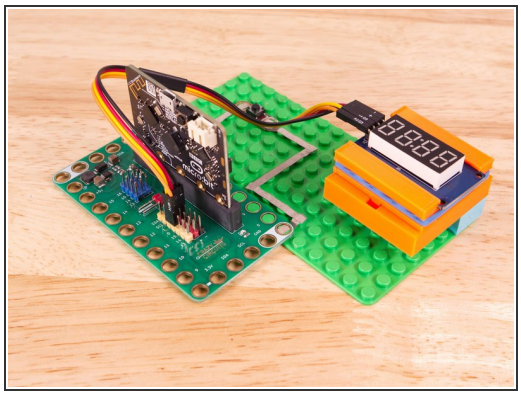
PARTS:

- Crazy Circuits Bit Board (1)
- micro:bit (1)
- 7 Segment Display (1)
- Standard Pushbutton Chip (1)
- Crazy Circuits Ribbon Cable (1)
- Maker Tape (1)
  1/8" Wide

Step 1 — Connect the 7 Segment Display and Button





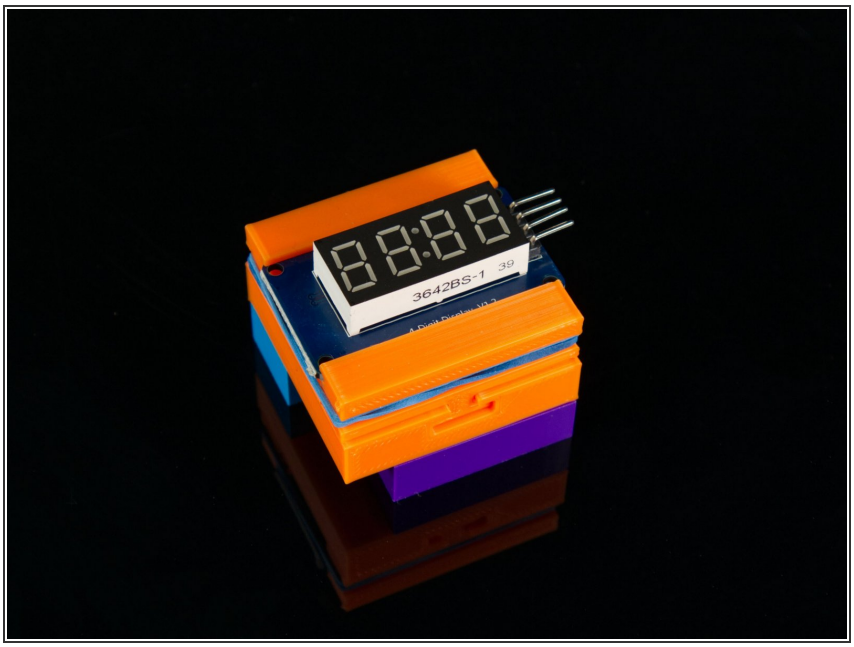


- We'll connect the **7 Segment Display** with a **Crazy Circuits Ribbon Cable** using all four wires.
- Start by plugging the connector with the three wires in it (Black, Red, Yellow) into the **Pin 1** row of the Bit Board. (Make sure the Black wire is in **-** and the Yellow wire labeled **S1** is closest to the number **1** on the Bit Board.) We can then plug the Orange wire labeled **S2** into **Pin 0** on the Bit Board.
- Now we'll connect the other end of the Ribbon Cable to the **7 Segment Display**. The pin labels are on the back of the 7 Segment Display PCB. From top to bottom it's **CLK**, **DIO**, **VCC**, **GND**.
  - **CLK** stands for **Clock** and **DIO** stands for **Data Input/Output**. **VCC** is the **Positive** (+) and **GND** is the **Ground** (-) or **Negative**.
- **S2** (Orange) goes to **CLK**, **S1** (Yellow) goes to **DIO**, and then **+** (Positive) goes to **VCC** and **-** (Ground or Negative) goes to **GND**.

☑ Make sure every wire is connected in the correct place, or our display will not work!

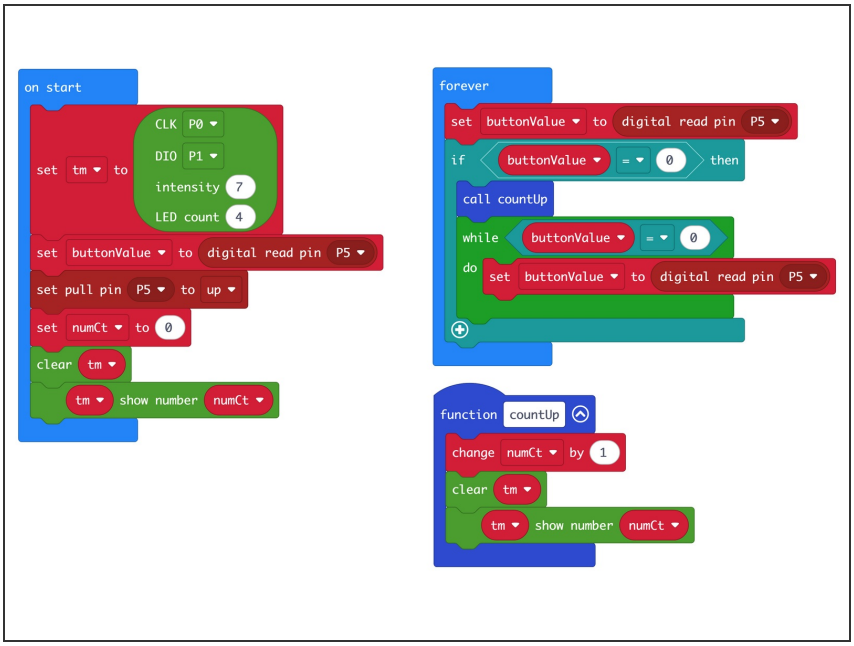
- We'll use **Maker Tape** to connect the Button to the Bit Board on a LEGO baseplate. Connect the **Button** to **Pin 5** and to **Ground** (GND).

Step 2 — Mounting the Display



- We used a 3D printed holder we designed to hold the 7 Segment Display in place on the LEGO baseplate.
- You can find the guide for the holder here: 7 Segment Display Holder
- Alternately you can use some LEGO bricks and a rubber band or tape to hold the display in place.

Step 3 — Load the Code



- If you've never used a micro:bit before you'll want to check out this guide: Bit Board V2 Setup and Use
- We're going to load the following code for our **7 Segment Count Press** program: https://makecode.microbit.org/_APaKwA488...
- In the on start block we'll set up our display using the pins we've connected. **CLK** to **Pin 0** and **DIO** to **Pin 1**. (We'll also set up a few more things we need for our program.)

- We've added a bit more logic into our forever loop. We will read the state of **Pin 5** and assign it to the variable **buttonValue**. (It will be either **1** or **0**.)
- We then check if the value of **buttonValue** is **0**, meaning the button has been pressed. (When the button is not being pressed the value will be **1**.)
- When the if statement is **true** we will call the countUp function to increase and display the number, and then we'll get stuck in the while loop as long as the **buttonValue** remains **0**, which means the button is still being held down.
- In the while loop we continually check to see if the **buttonValue** changes, by reading **Pin 5**. When the button is *released* the value becomes **1**, and is no longer **0**, so the while loop ends.

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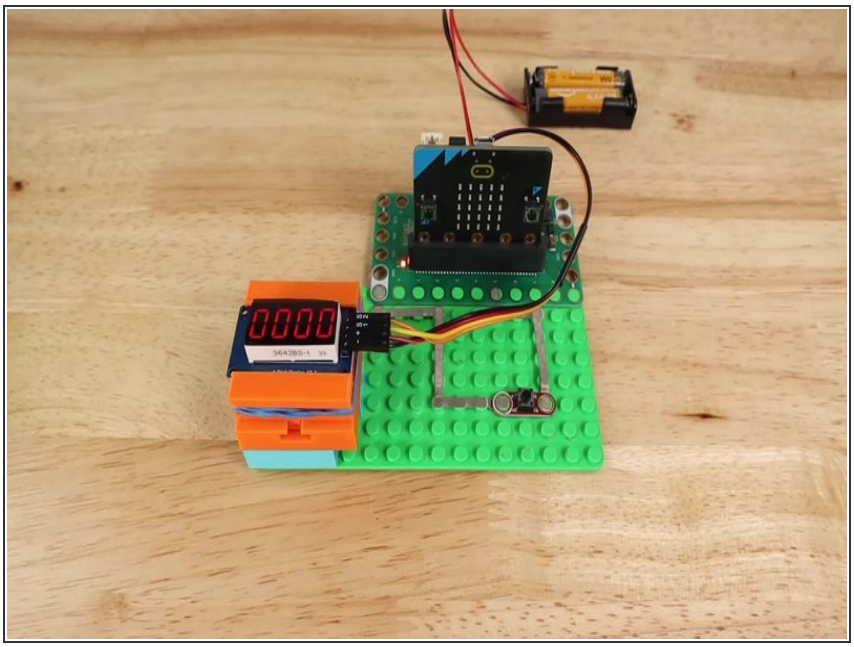
Step 4 — Test it Out!

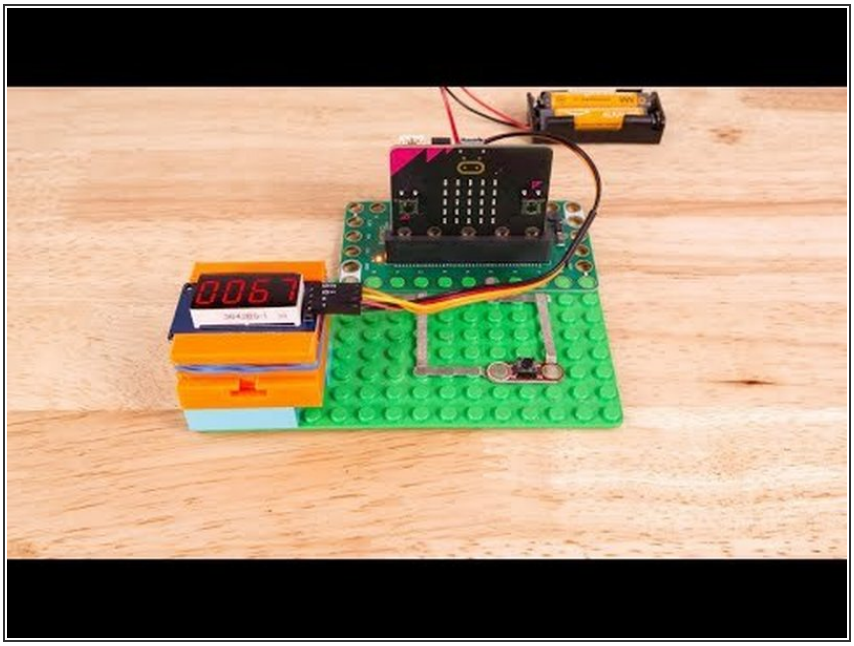


- Once the code is loaded it should start running immediately and the 7 Segment Display should show 0000.

ⓘ You can power the micro:bit via the USB cable you used to load the code or you can use a battery pack plugged into the Bit Board.

- Press the button and the number will increase.
- There are not really any "gotchas" with this version. You should be able to do the following:
  - Press the button and hold it down
  - Press the button repeatedly in rapid succession
- And it should always work as expected, increasing the number by one, and not doing it again until you release and press the button again.

Step 5 — Follow Along



- Follow along with our recorded Live Stream!
- ⓘ You can watch the full video of us walking through this project, along with explaining and exploring the code: https://youtube.com/live/Hi5u_Rk5xBU