Project 2: Up/Down Counter

Use two discrete 7-segment LED displays to show either a counter counting up or down, or leds rotating clockwise or counterclockwise.

Components needed:

- Arduino
- 2 7-segment LED displays
- 2 push buttons
- 1 potentiometer

System detail:

1. Display the number 12 for a second when power on or reset. The default startup mode is to count and the direction is up. Initially the counting is stopped at 0. So initially after showing the number 12 for a second it will show the count at 0.

2. A short press (less than 1 second) of one push button (button A) will alternate between starting and stopping the counting or rotating. So initially a short press of this button will start the counting going up. Pressing the button again will stop the counting. (2)[1]

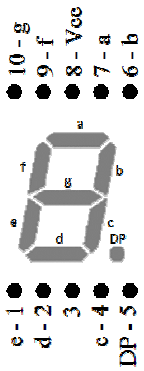
3. A long press (more than 1 second) of button A will alternate the mode between counting and leds rotating. The leds rotating is to show the leds move around the perimeter of the rectangle formed by the two LED displays. (3)

4. A short press (less than 1 second) of one push button (button B) will change the direction of the count or the rotation. If it is currently counting then it will alternate between counting up and counting down. If it is rotating then it will alternate between rotating the leds clockwise and counterclockwise.(4)

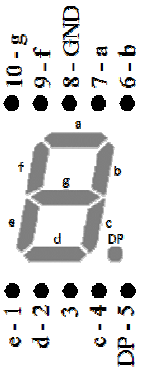
5. The potentiometer is used to change the speed of the counting or the leds rotating. When turned counterclockwise all the way to the end the counting or rotating will change every 2 seconds. When turned clockwise all the way to the end the counting or rotating will change every 0.1 seconds. Hint: use the map() function to map a number from one range to another range. (5)

[1] Numbers in parenthesis are points that you get when you accomplish up to that step. Total points possible is 5.

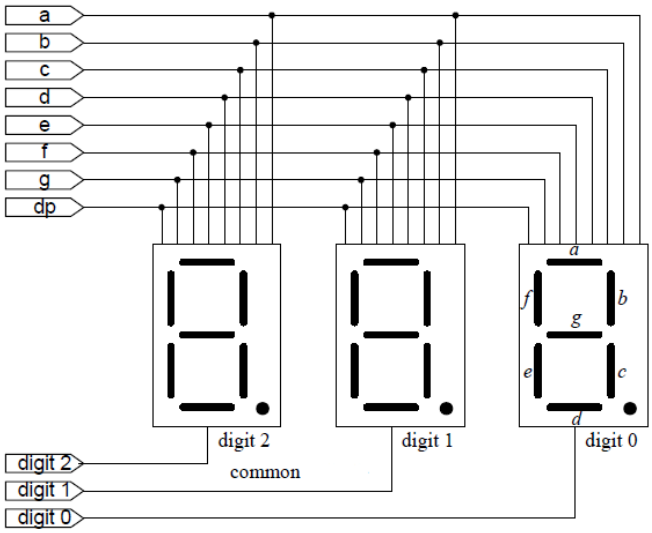
7-segment LED display connections:



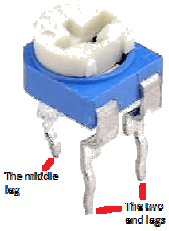
Common **anode** F5161BH

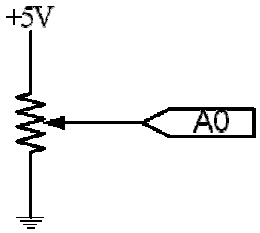


Common **cathode** F5101AH



Potentiometer connections:





Be careful. If you make a wrong connection here, you can create a short circuit.

- Connect one end leg to +5V.
- Connect the other end leg to GND
- Connect the middle leg to an analog input pin A0

Use the analogRead(A0) command to read in the value from A0. The value will be in the range 0 to 1023.