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EENG 350
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Assignment 1 Documentation

Encoder Truth Table

Last State		Current State		Direction	ΔCount
CLK	**DT**	**CLK**	**DT**		
0	0	0	0		
0	0	0	1	CCW	-1
0	0	1	0		
0	0	1	1		
0	1	0	0		
0	1	0	1		
0	1	1	0		
0	1	1	1		
1	0	0	0		
1	0	0	1		
1	0	1	0		
1	0	1	1	CW	1
1	1	0	0		
1	1	0	1		
1	1	1	0		
1	1	1	1		

(Compared to the given table, A is DT and B is CLK)

(a) How many digital I/O pins do you have access to on the Uno? How many of these pins can provide pulse width modulated (PWM) analog output? Provide an examples where you might use the PWM functionality of those pins.

14 total digital I/O pins, 6 of which have PWM. Using the PWM helps reduce unwanted noise from mechanical inputs.

(b) How many analog I/O pins do you have access to on the Uno?

6

(c) What is the recommended supply voltage for the Arduino?

7-12V

(d) How many external interrupts are available on the Uno, and on which pins?

2, accessed through pins 2 and 3.

(e) What are the two functions that will always be a part of an Arduino sketch? Explain the purpose of each of these functions.

Setup() runs once and initializes your program. You can assign inputs and outputs and initialize anything you haven't done globally. Loop() is effectively main() and runs continuously.

(f) What is the purpose of the delay function in an Arduino sketch? What is the main drawback of using the delay function to control timing?

Delay(int x) delays by x milliseconds, which can help prevent the code in loop() from running constantly, delay() stops all other activity on the board so nothing else can happen while it's active.

(g) What are the alternatives to using the delay function?

Using millis() to help with control flow is a good alternative.

(h) What is a pull-up resistor, why is it used, and how can it be implemented internally on the Arduino?

A pull-up resistor keeps an input at a known state to mitigate the rapid toggling caused by mechanical switches. The pin reads high when the actual device is open, and low when closed. A digital pin can use the internal pull-up resistors if its configured as INPUT_PULLUP instead of INPUT.

2. Save your well commented and easily readable sketches for the demonstration exercises, and upload a copy of each to the assignment link on Canvas.