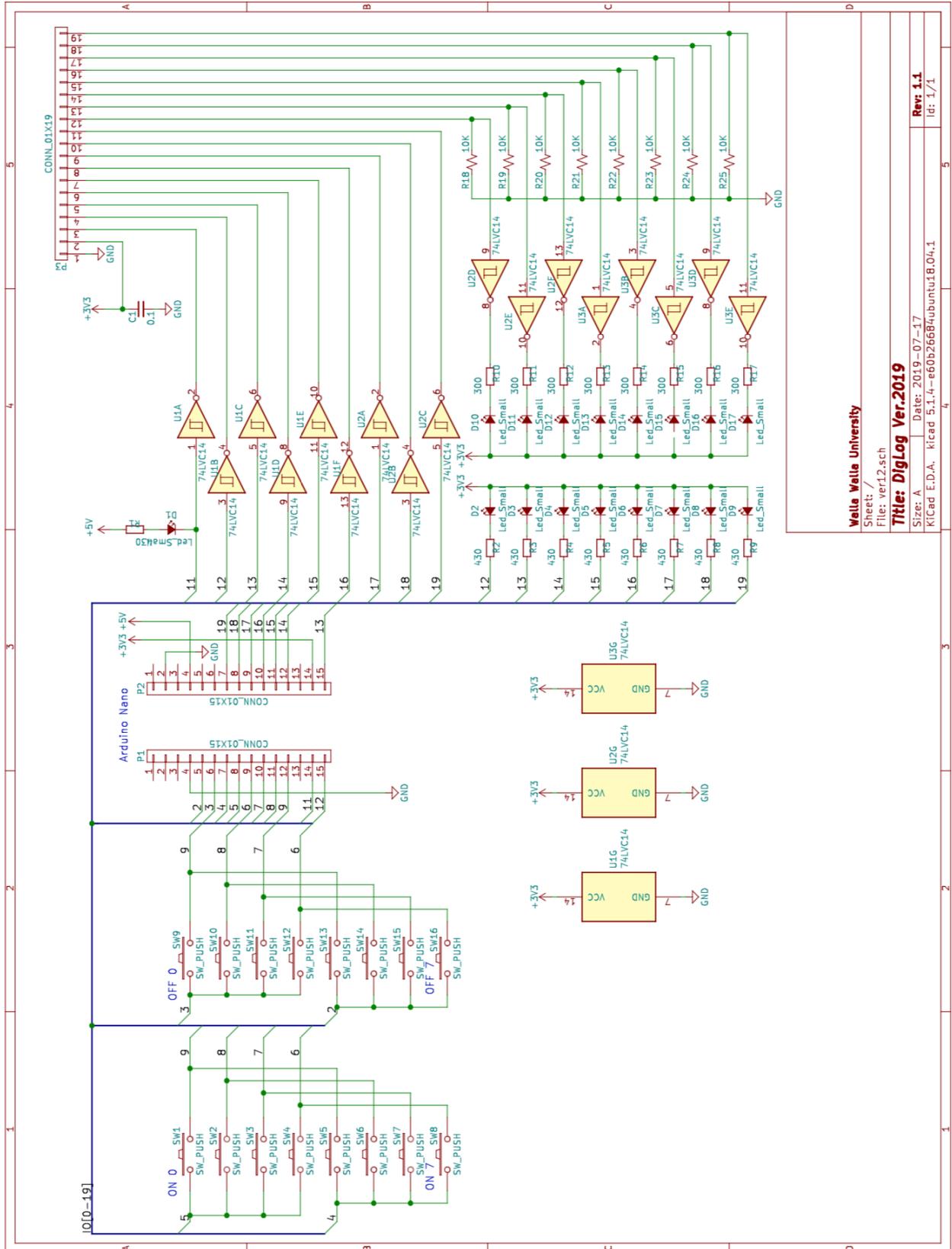


Parts List

Quantity	Reference	Part Number	Description	Surface Mount?	Value
1			Circuit board		
1		Arduino Nano	Embedded board w/ 3 male header strips	n	
1			Wall wart w/micro-USB connector		
1			19-pin 0.1" female I/O header	n	
2			15-pin 0.1" female Arduino headers	n	
3	U1,U2,U3	74LVC14	Inverters (level conversion)	y	
16	SW1-16		Momentary contact SPST switch	y	
17	D1-D17		LED's	y	
9	R1-8, 17		Resistor 0804	y	430 Ω
8	R9-16		Resistor 0804	y	300 Ω
8	R18-25		Resistor 0804	y	10K Ω
1	C1		Capacitor 0804	y	0.1uF
5 feet			Red wire		
5 feet			Black wire		
1			Wire strippers		
1			Proto-type board		
1			Anti-static foam		
1			Cardboard box		
2		74HC00	Quad 2-Input NAND Gates		
1		74HC02	Quad 2-Input NOR Gates		
1		74HC04	Hex Inverting Gates		
1		74HC10	Triple 3-Input NAND Gates		
2		74HC74	Dual Positive Edge-triggered D Flip-Flops		
1		74HC86	Quad 2-Input XOR Gates		
1		74HC138	3 to 8 Line Decoder/Demultiplexer		
2		74HC153	Dual 4-to-1 Multiplexer		
1		74HC163	Fully Synchronous 4-bit Counter		



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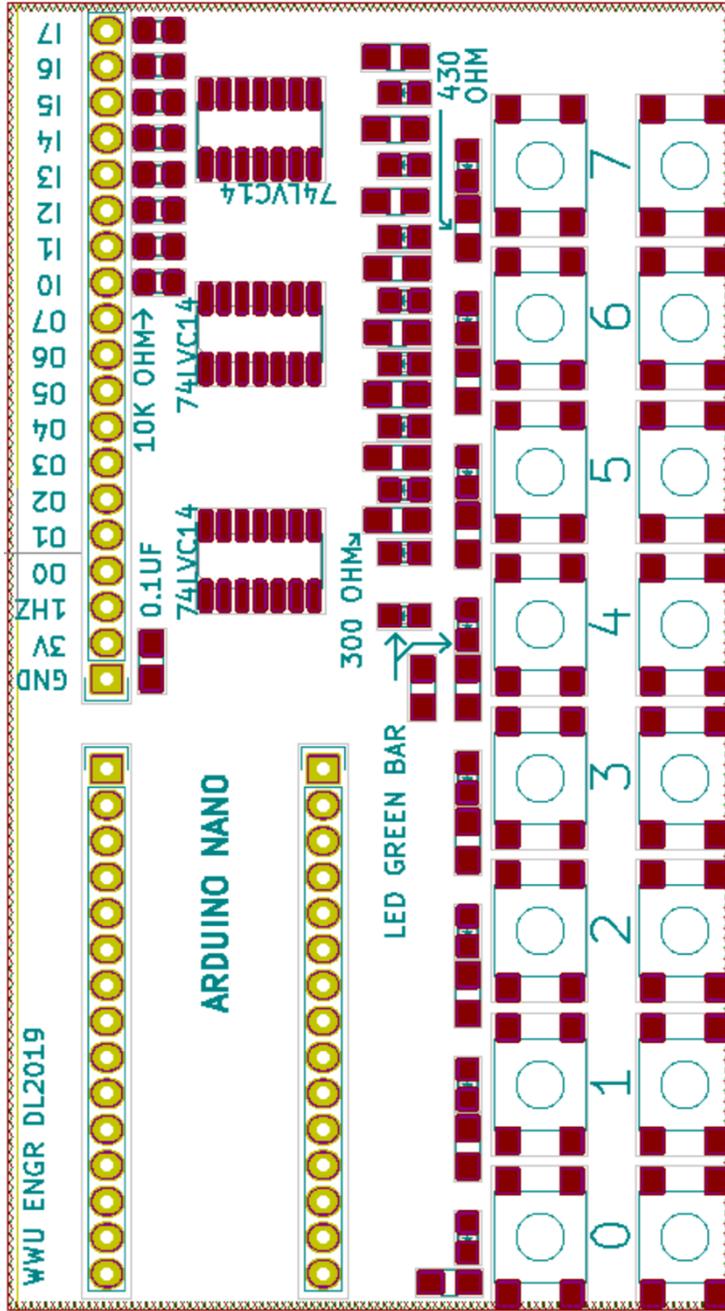
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How to Start Building Circuits

- Step 1 Develop a logic expression for the circuit to be implemented.
- Step 2 Draw a logic diagram of the gates and interconnections.
- Step 3 Label the logic diagram to show the signals coming into the logic and the signals going out of the logic using mnemonics of your choice.
- Step 4 Verify that the assertion levels that you have assumed for your logic match the assertion levels actually generated by the signal sources. Remember that the push buttons on your logic kits are toggle-on/toggle-off.
- Step 5 Using the package diagrams supplied, label the inputs and outputs of each gate with a pin number. **Also note the pins on each package that need to be connected to Vdd or ground.**
- Step 6 With the power disconnected, install the required parts in the breadboard. Make sure the pins are aligned with the holes before attempting to insert the part.
- Step 7 Connect ground on your breadboard to the ground pin on each integrated circuit used and +3 volts to the power pin of each integrated circuit.
- Step 8 Interconnect the logic gates using the pin numbers written on your logic diagram.
- Step 9 Connect the signal inputs and outputs.
- Step 10 Turn on the power and begin checking to see if the circuit works as desired.

Precautions

- Turn the power off while changing the wiring. This will reduce the chance of accidental damage that might occur if connections are temporarily made incorrectly.
- As you approach a table or desk where your logic board and parts are located, discharge the static electricity that has accumulated on you before touching the boards or the logic packages. While the 74HCxx chips are robust, thousands of volts of potential can be generated on your body and may overwhelm the protection circuits in a chip. The result: gate destruction. Also, there are CMOS parts on the I/O logic board which are much more sensitive. You can discharge yourself by touching a point of ground potential on your circuit or logic board.