

# Digital Stop Watch

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# What is a stop watch?

- A stopwatch is a handheld time piece designed to measure the amount of time elapsed from a particular time when it is activated to the time when the piece is deactivated.



## Two Types of Stopwatches

### Mechanical

- Powered by a mainspring which must be periodically wound by turning the knurled knob at the top of the watch.

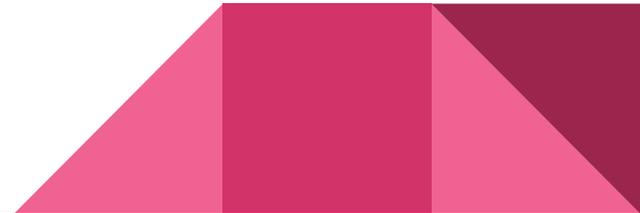
### Digital

- Powered by electricity and functions based on a crystal oscillator timing element.

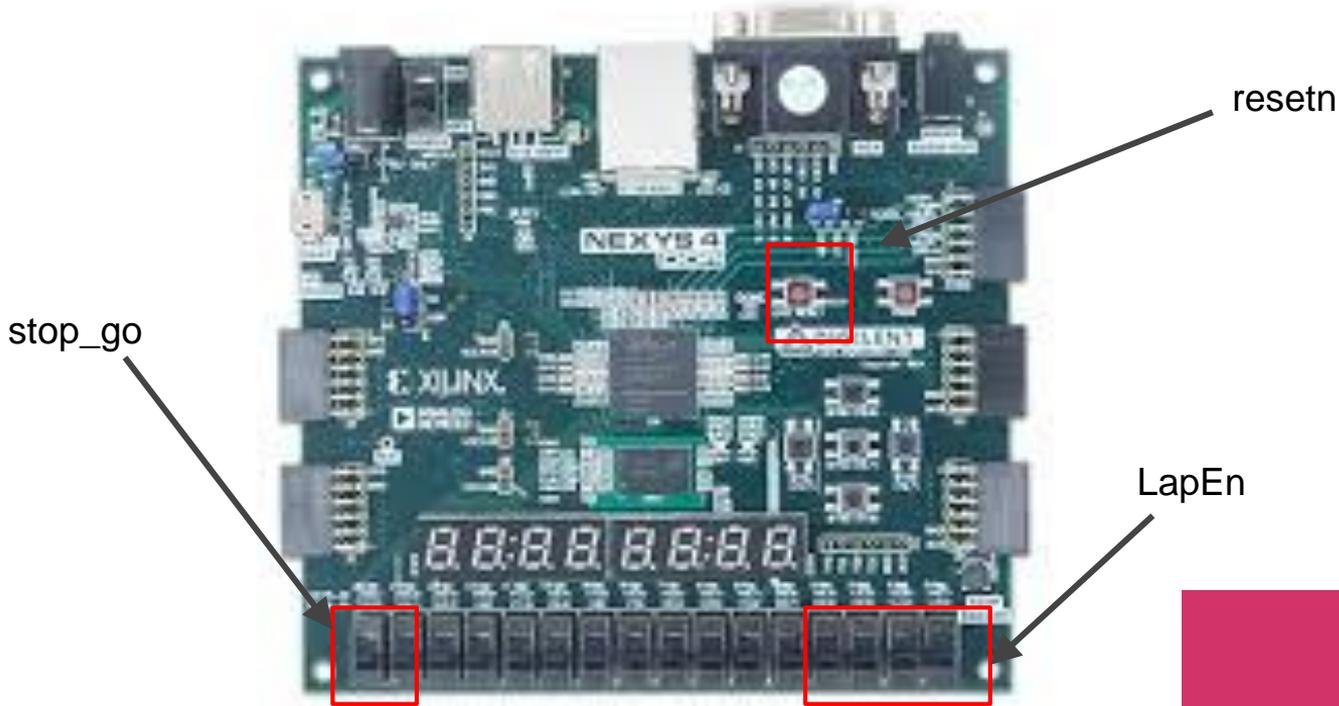


# Functionality

- Max time of 99:59:59:99 displayed on the 7-segment display
- Increments of 10 ms (0.01 s)
- stop\_go –Starts and pauses the time
- LapEn–Records the instant count when each individual switch is flipped
- Reset–Resets the time to 00:00:00:00
- Clock–Built in 100 mHz

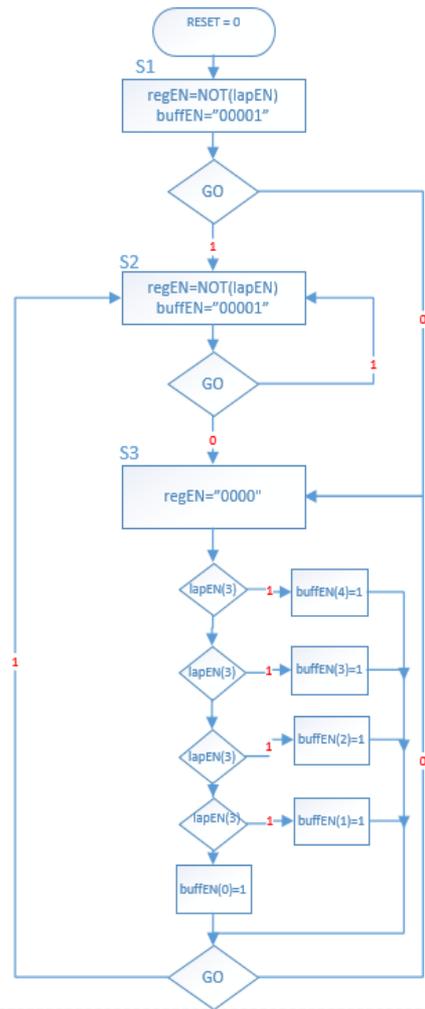


# Board Schematic

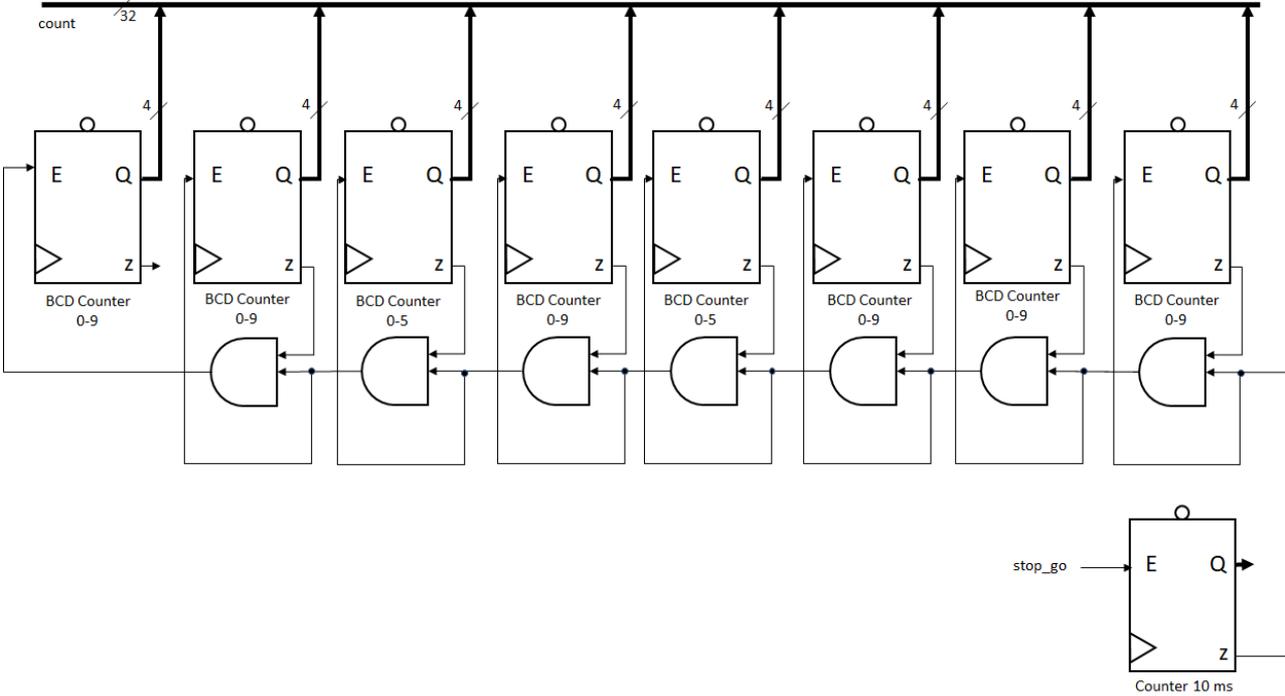




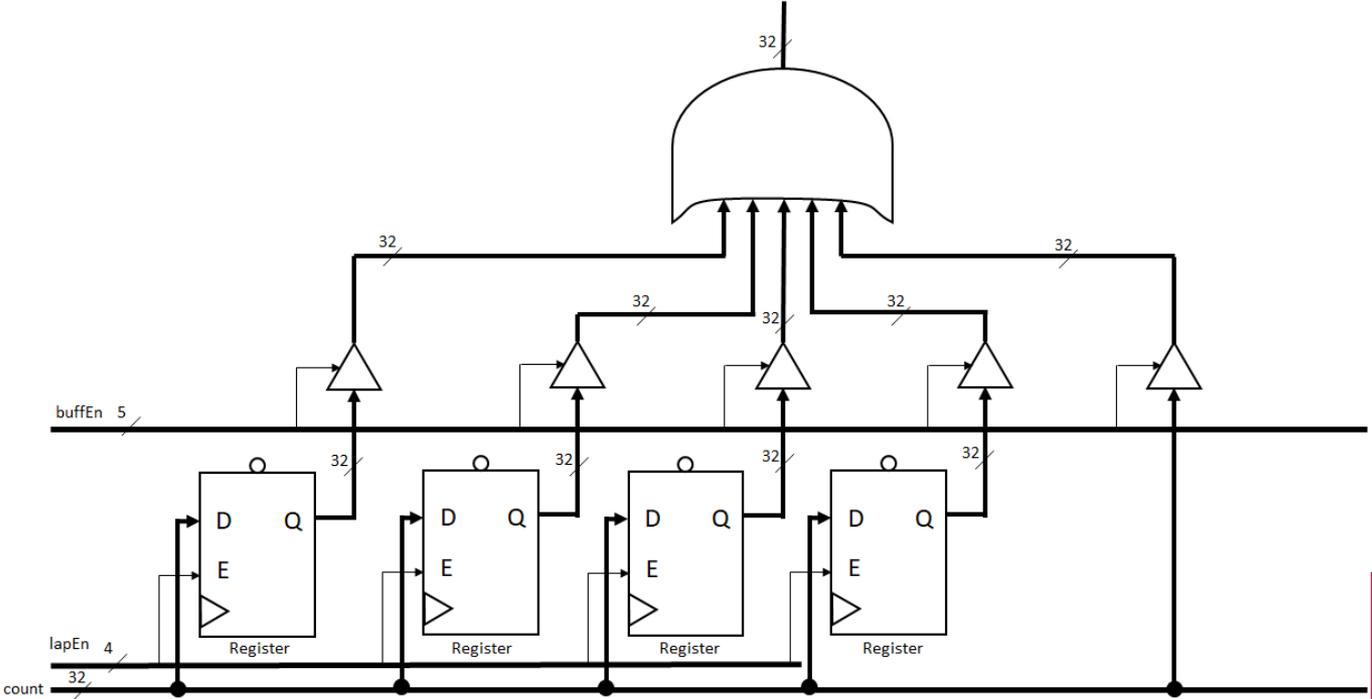
# State Machine



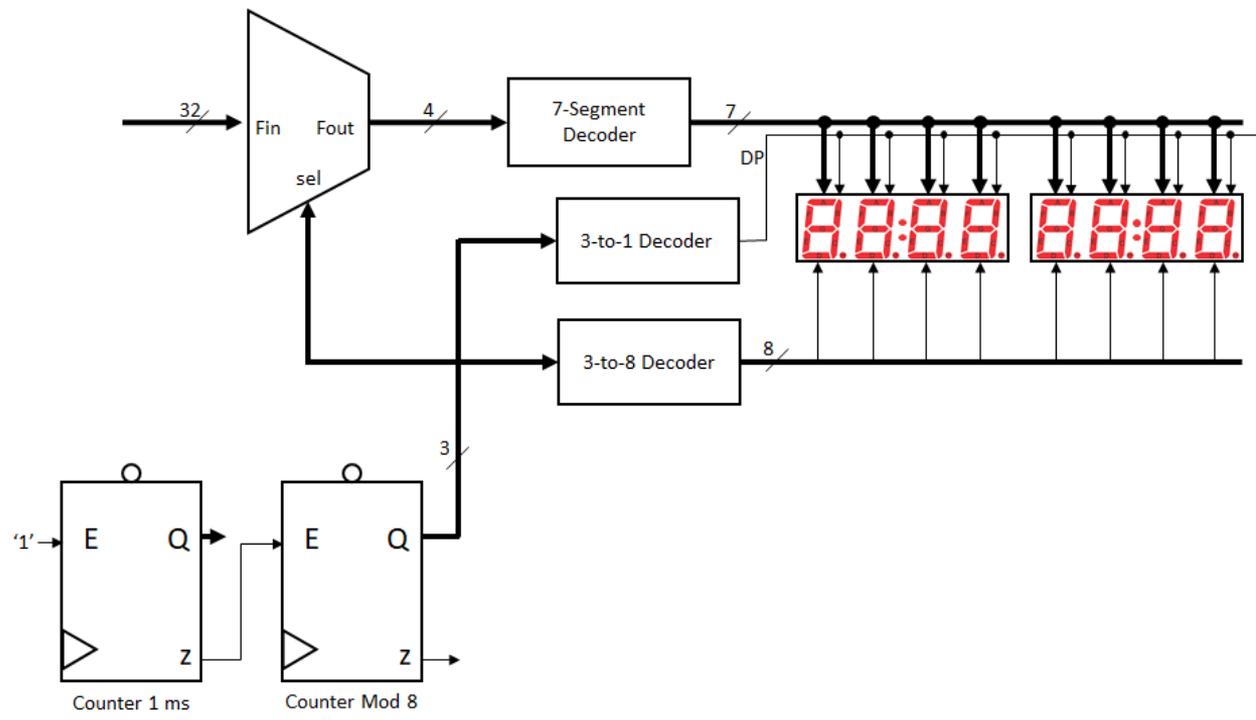
# Counters



# Registers



# Display



# References

-VHDL Coding Tutorial- Daniel Llamocca-

<http://www.secs.oakland.edu/~llamocca/VHDLforFPGAs.html>



Questions, Comments, Concerns?

