

# Digital Stop Watch

Matthew Guirguis  
Andy Lalaj  
Jean-Pierre Ortiz  
Derek Ramos

# 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.

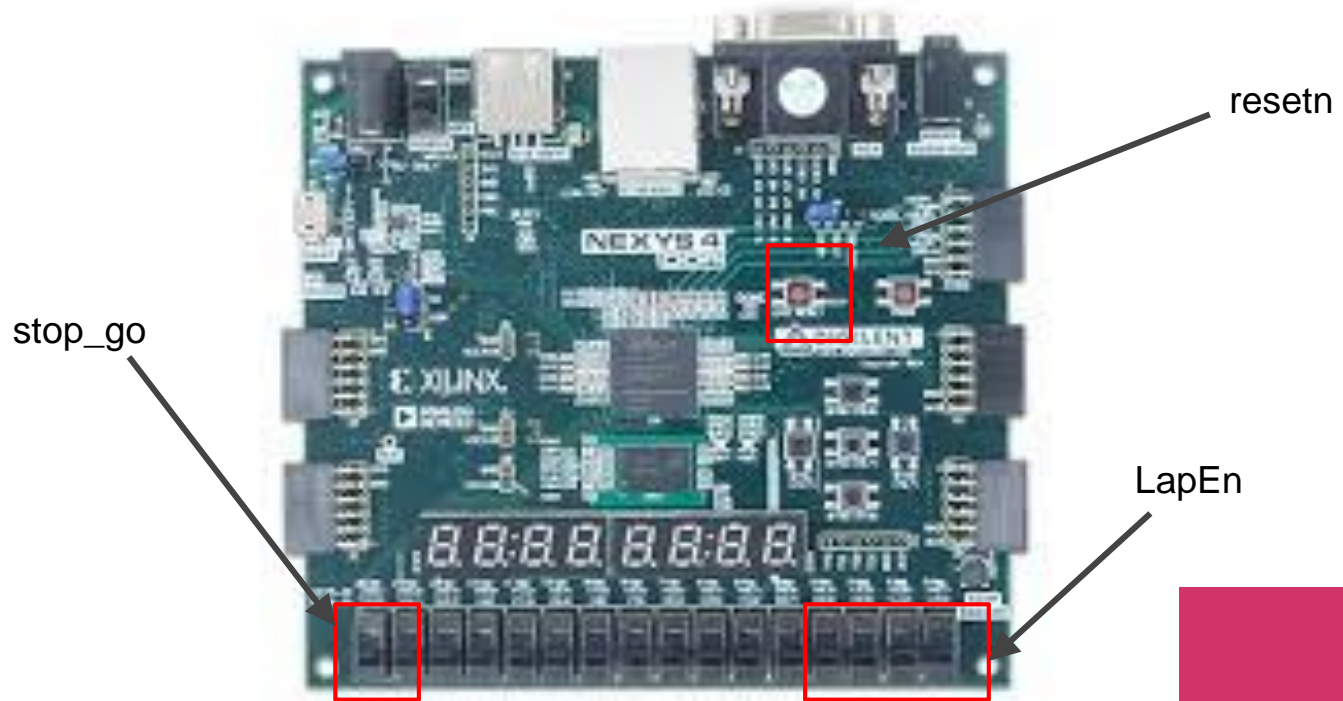


# Functionality

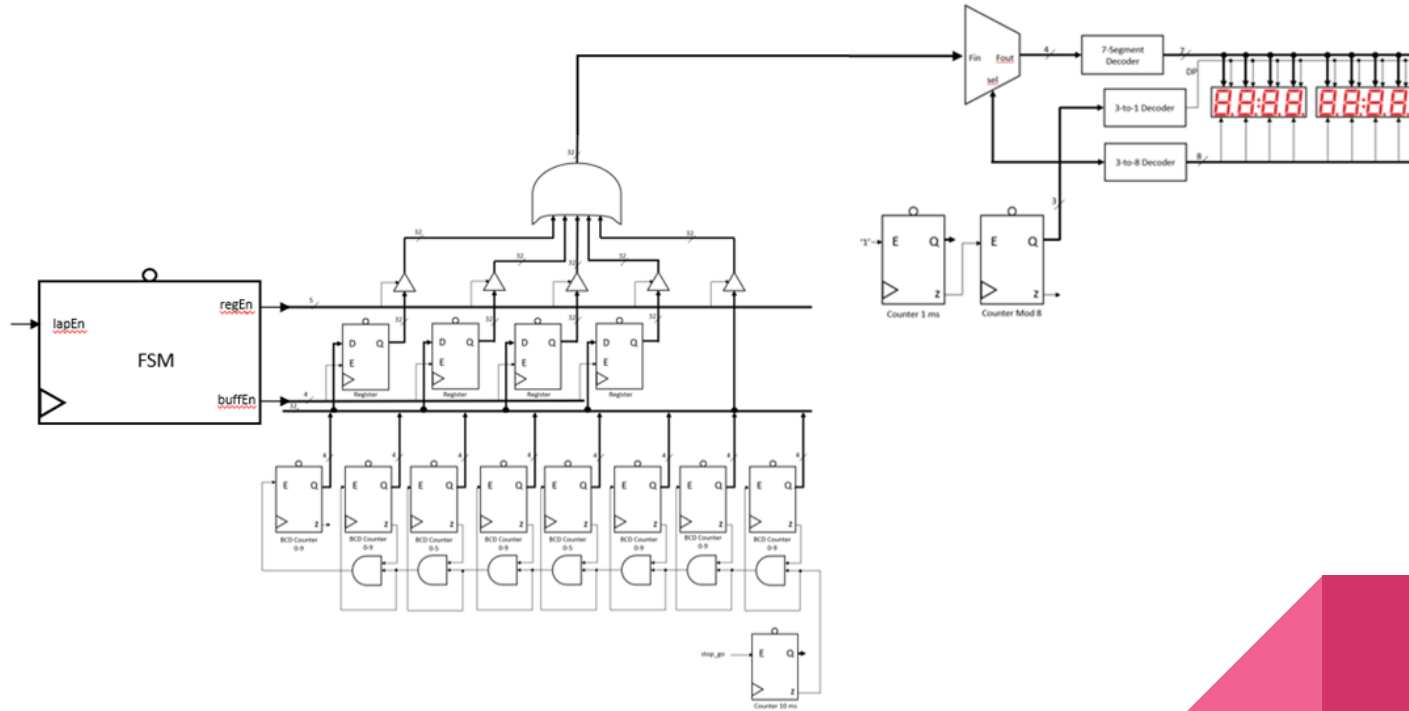
- Max time of 99:59:59.99 displayed on the 7-segment display
- Increments of 10 ms (0.01 s)
- stop\_go –Starts and pauses the time
- LapEn–Records the instant count when each individual switch is flipped
- Reset–Resets the time to 00:00:00:00
- Clock–Built in 100 mHz



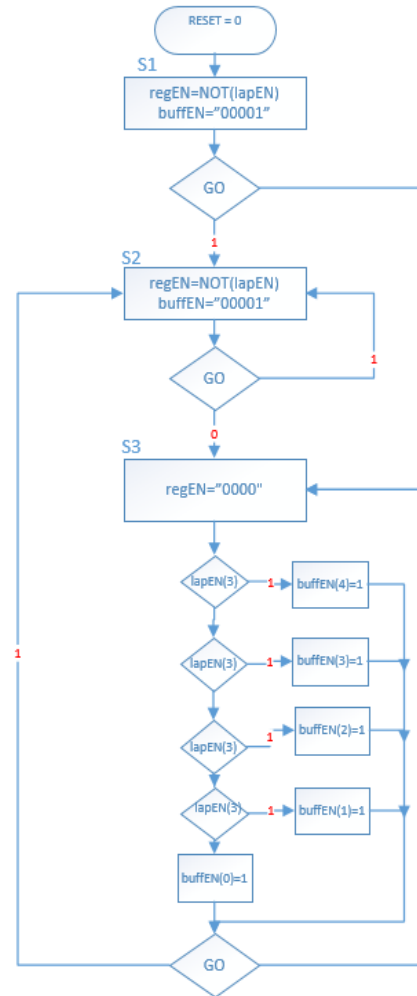
# Board Schematic



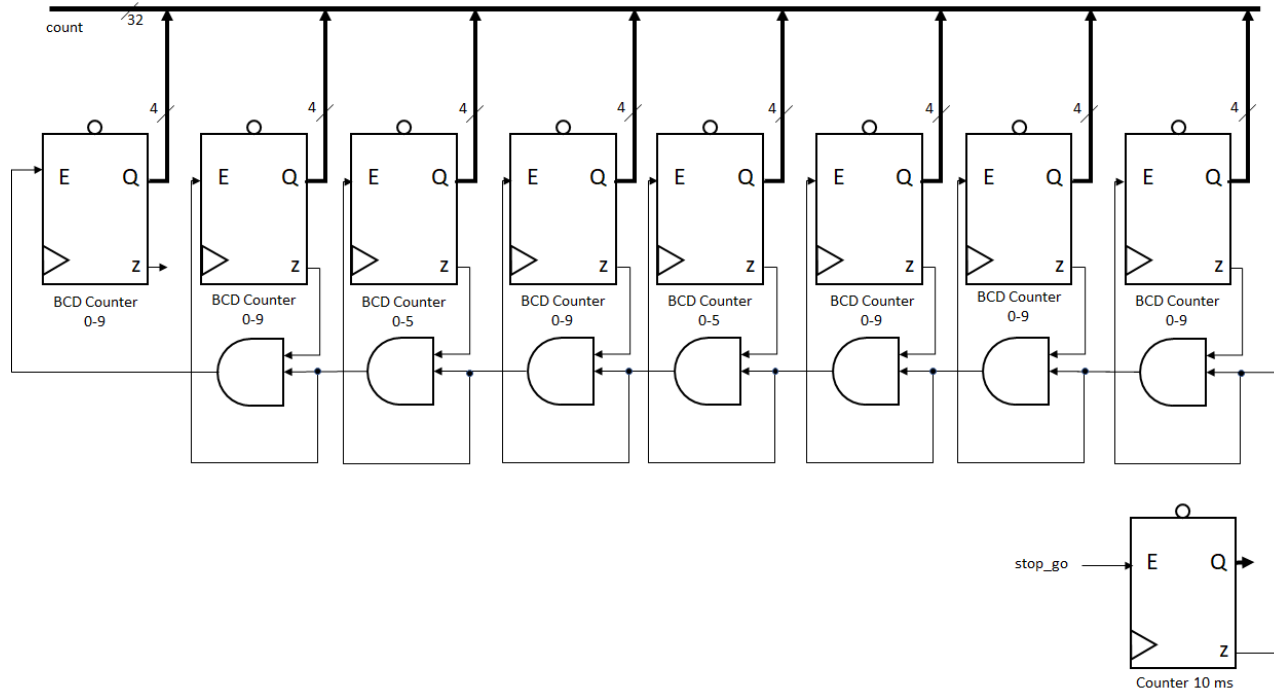
# Circuit Design



# State Machine

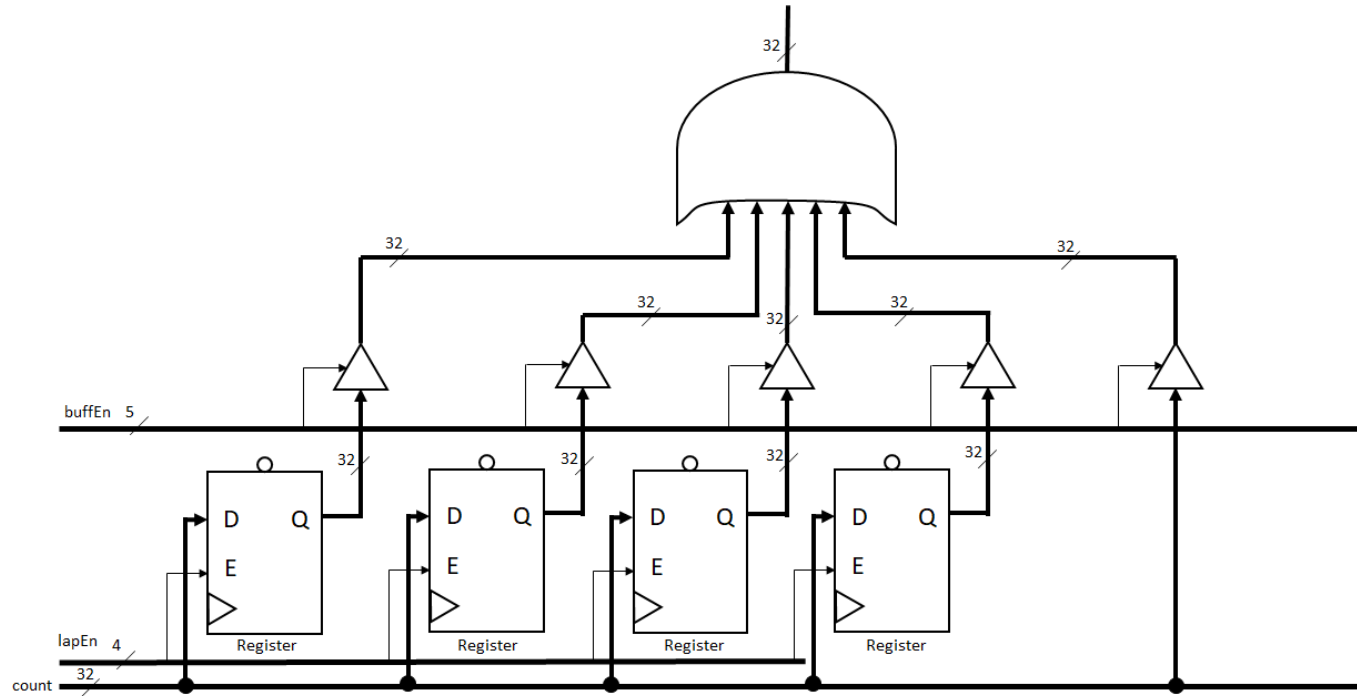


# Counters

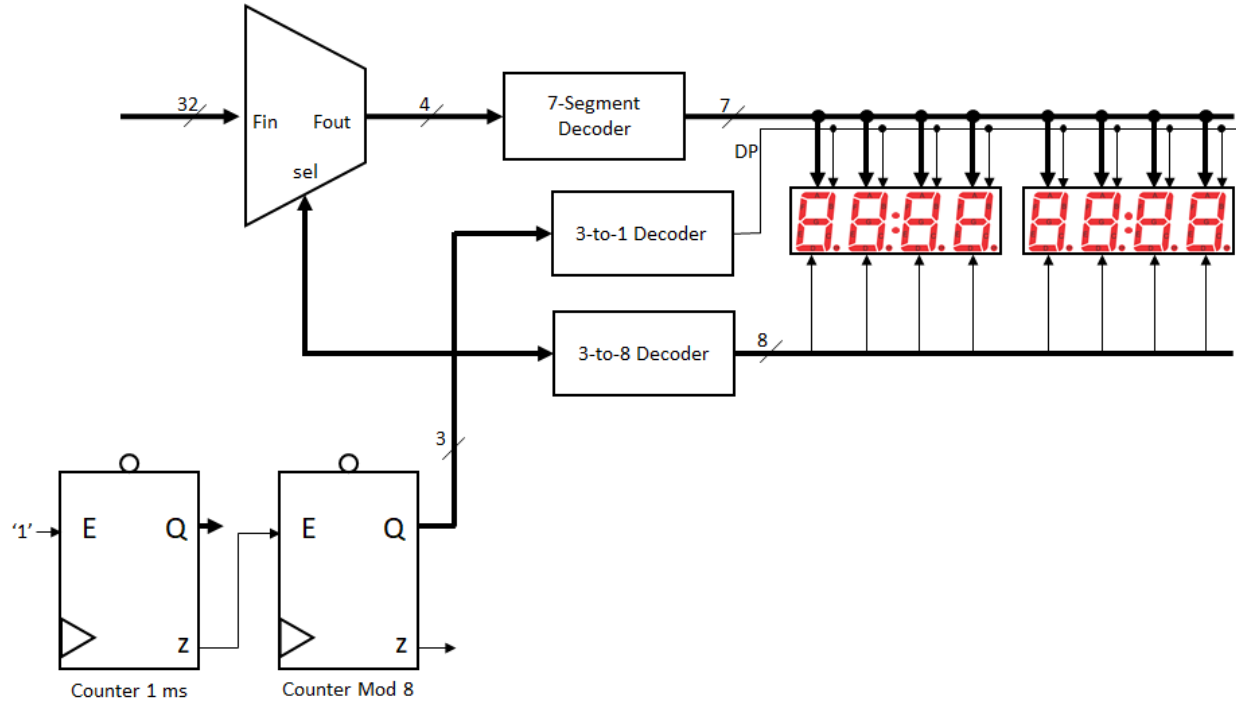




# Registers



# Display



# References

-VHDL Coding Tutorial- Daniel Llamocca-

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



Questions, Comments, Concerns?

