

Digital Electronics

Digital Timer Project

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Introduction

1. Project
2. Definitions
3. Screenshots
4. Conclusion



The Project

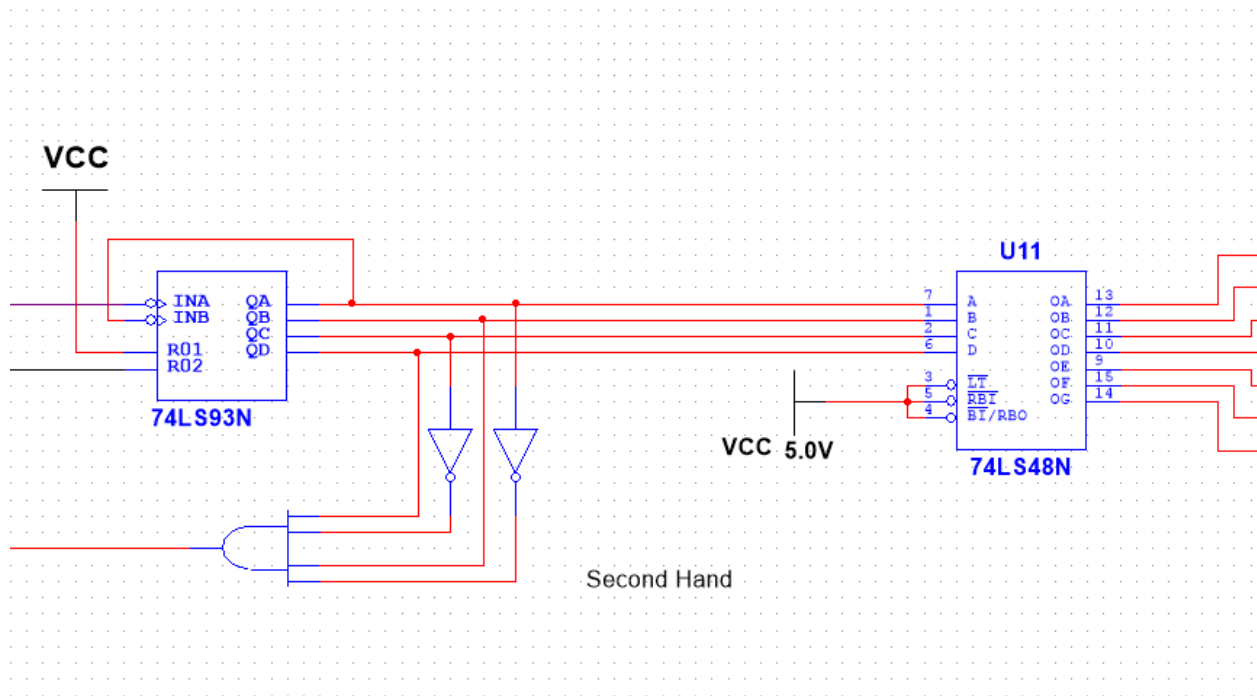
This project involves designing and implementing a digital timer circuit. The timer must correctly display time on multiple seven-segment displays, accurately count time using logic circuits, and follow design constraints given in our checkpoints.

Definitions:

- **Input:** A signal that goes into a clock or input area. It is normally active high, and signals a change in state.
- **Output:** The signal that is taken out of something, it can trigger effects, like a probe, or a secondary part of a circuit.

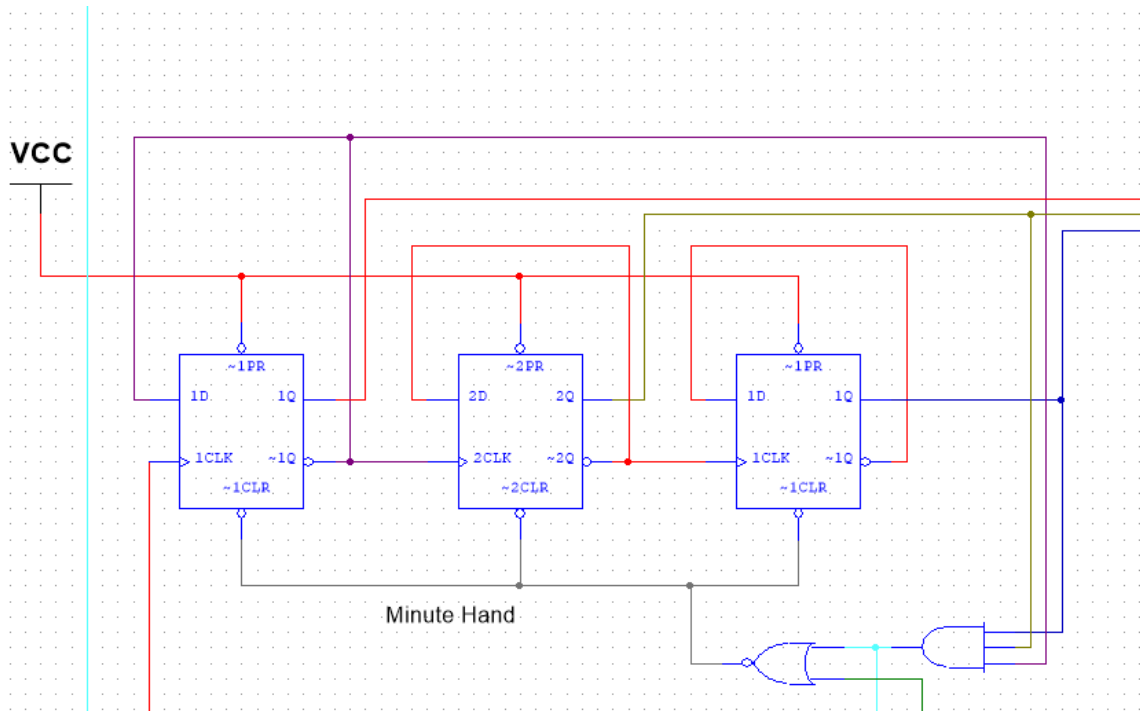
The Segments

Description: This uses a 74LS93N circuit paired with a seven segment display driver in order to have the numbers run from 0-9, triggering once a second.



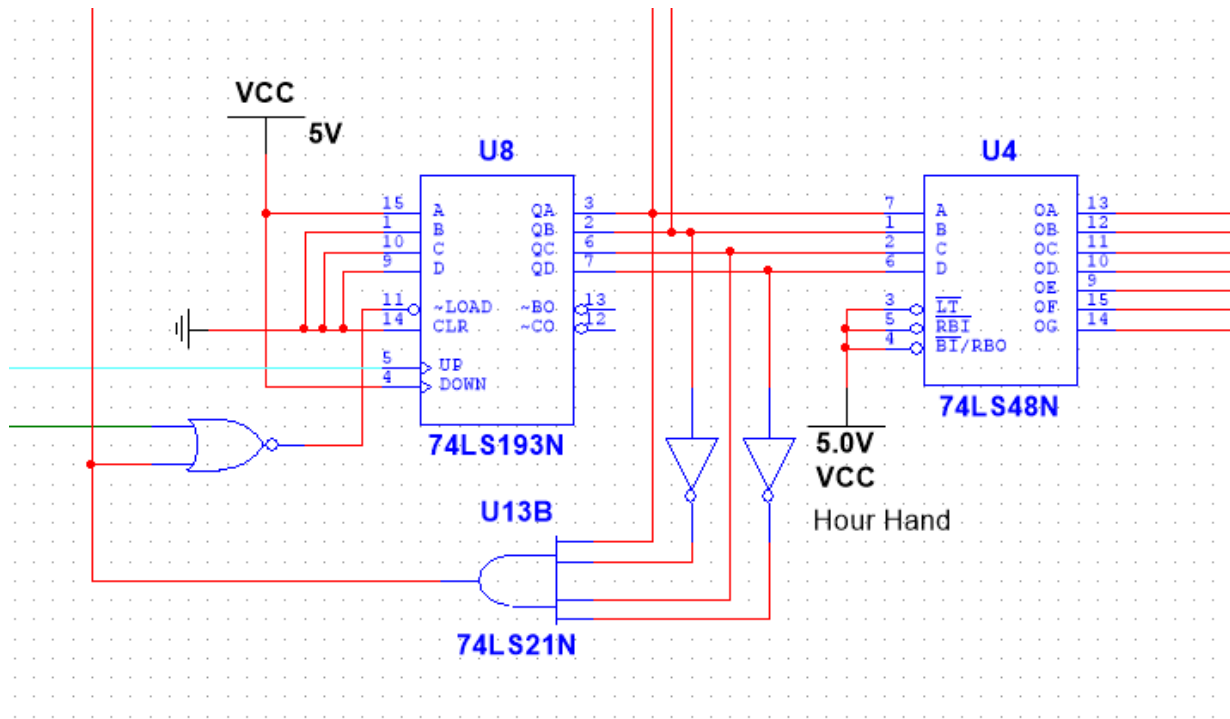
The Segments

Description: This uses a d-flip flop circuit paired in order to have the numbers run from 0-5, triggering six times a minute.

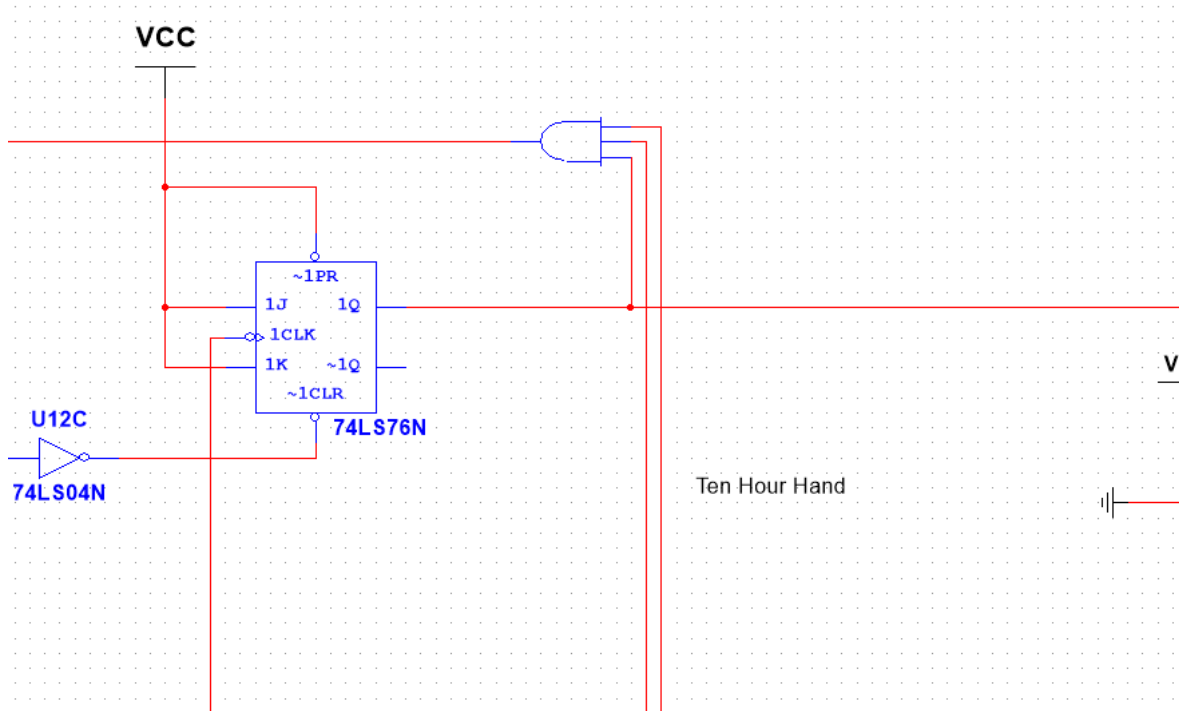


The Segments

Description: This uses a 74LS193N circuit paired with a seven segment display driver to make a cycle of 0-2 to manage the hour hand.



Description: This uses a jk flip flop to make a cycle of 0-1 to manage the ten-hour hand.





Conclusion

1. I would choose a synchronous implementation using MSI components. It makes it a lot easier to manage, since it doesn't need outside input, and the MSI makes it where I have a preset I can use instead of having to build flip flops.
2. I would make it where the displays are only on for some of the time to preserve the energy it uses.
3. The most difficult part of the project was linking all of the hands together, because making the output signals the same as the input signals was very difficult.