جامعة عين شمس
كليـة الهندسة
قسم هندسة الحاسبات و النظم
Computer & Systems Engineering Department

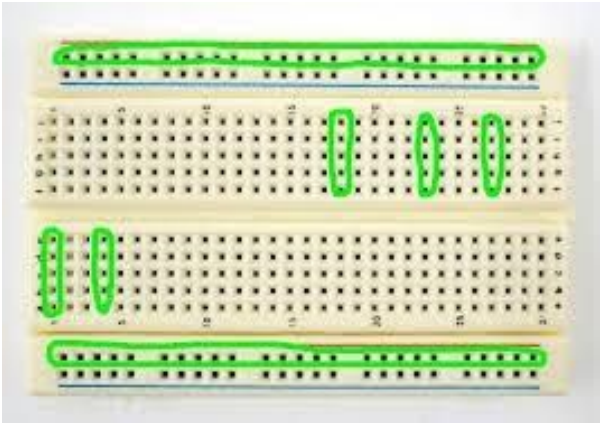
CSE 111: Watch Project

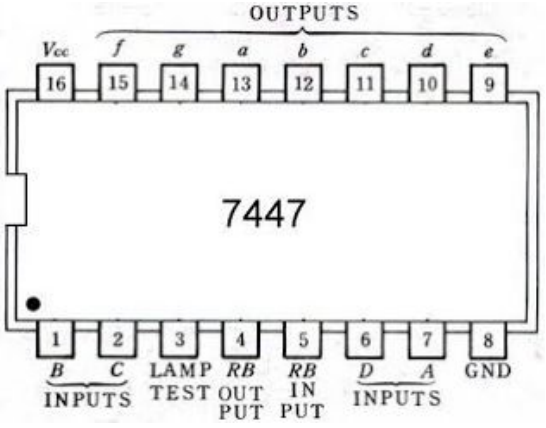
In this project you are required to design a digital timer that has two digits. It counts from 0 to 59, and then restarts from 0.

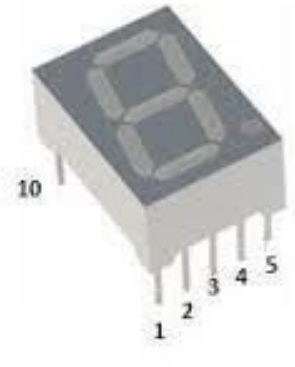
You should illuminate 2 digits using 2 seven segment displays.

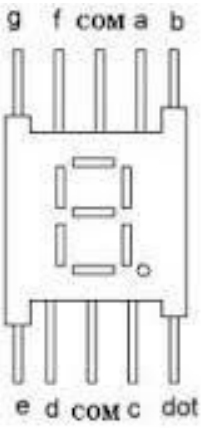
NOTE: YOU WILL NEED TO USE A SIMULATOR (SIMULIDE) FOR THIS PART INDIVIDUALLY. MAKE SURE YOU ARE SAVING THE CIRCUIT TO A FILE SO THAT YOU CAN MODIFY IT LATER (AND SUBMIT IT FOR EVALUATION).

1. For this purpose you will need the following components:
   - Breadboard
   - 7446 or 7447 Seven segment decoder (with inverted outputs)
   - Common anode 7-segment display
   - 350 Ω resistors
   - Male Jumper wires
   - 5V supply (or battery). You can use a 9V battery and a voltage regulator (For the simulation, you don't need to use a regulator)





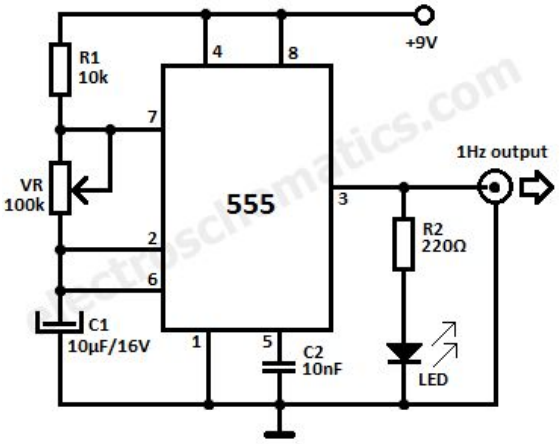




Use the 555 IC to generate a clock of a frequency 1 Hz.

For the counter you can use the 74160 IC, where you will use only the Q pins as outputs, the Clock input coming from the 555, Vcc, and GND. Ignore all other pints.

Hint: The CARRY OUTPUT, of the rightmost counter, should be as an input for the left adjacent counter. A pulse is generated on the carry output, once the counter goes from 9 to 0.
(Check the datasheet for modes of operation/ schematic)



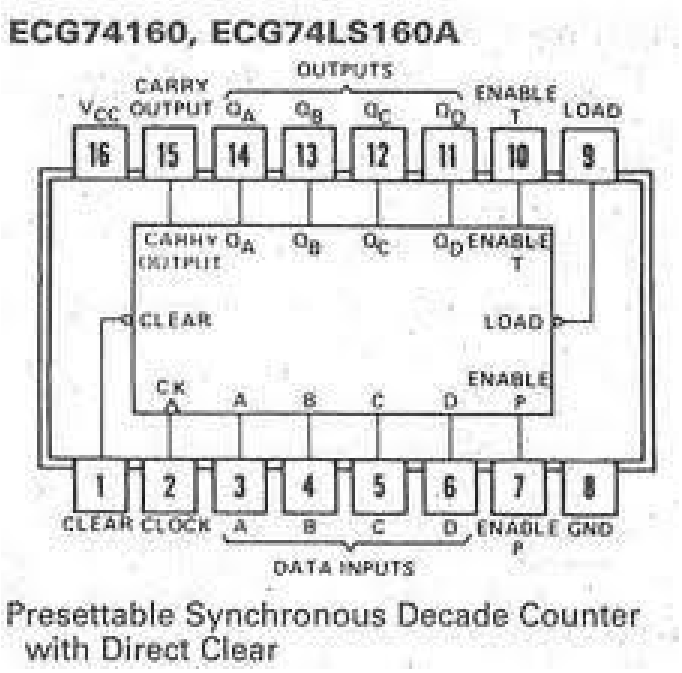
Bonus:

Make 4 digits, two of them for the seconds, and the other two for displaying minutes. When you reach 59, in the next clock cycle the minutes are augmented by one and the seconds resets to 0, and restarts counting.

TTL Data Book:

You can find all you need to know about the IC's to be used in the TTL Data Book

https://www.smcelectronics.com/DOWNLOADS/1976-TTL%20DATABOOK.PDF



Presettable Synchronous Decade Counter with Direct Clear