

## EE 308 – Prelab for Week 3 of Lab 3

1. Write some C code to set up the MC9S12 to capture the time of a falling edge on Bit 2 of Port T, and to generate an interrupt when the capture occurs. Set the interrupt vector to call the function `tic2_isr`. Set the timer overflow interrupt rate to about 175 ms.
2. Write an interrupt service routine called `tic2_isr` which capture the times of two consecutive falling edges on Bit 2 of Port T, and set a global variable to the time between the two falling edges.
  - Use a `static` flag in the ISR to indicate whether you should capture the first or second edge.
  - If the flag indicates that you should capture the time of the first edge, save the time in a `static` variable (e.g., `time_1`). Set the flag to indicate that the time of the first edge has been captured, and that the next time the ISR is entered, it should capture the time of the second edge.
  - If the flag indicates that you should capture the time of the first edge, save the time difference between this time and the time of the first edge in a global variable (e.g., `time_diff`). Set the flag to indicate that the time of the second edge has been captured, and that the next time the ISR is entered, it should capture the time of the first edge.
3. Write some C code to set up the MC9S12 to set up Bits 3 and 4 of Port T as Output Compare, and to generate interrupts when the compares occur. Set the interrupt vectors to call the function `toc3_isr` and `toc4_isr`. Set the timer overflow interrupt rate to about 175 ms.
4. Write an interrupt service routine called `toc3_isr` which generates a 250 Hz square on on Bit 3 of Port T.
5. Write an interrupt service routine called `toc4_isr` which generates a signal which looks like this:

