UNIVERSITY OF WALES, ABERYSTWYTH
Department of Computer Science

CS25510 – COMPUTER HARDWARE LABORATORY WORK

THRSIM Simulator – Interrupts And the Output Compare mechanism

1) Obtain the INTERRUPTS.ASM file from the CS255 web page

2) Open the INTERRUPTS.ASM file and take a look at the contents. Don't worry about all the details for now. Attempt to work out where the program begins.

3) Assemble the file, and using the View menu, open up the window containing the Port A pins.

4) Run the program and observe the pin marked PA6/OC2. What happens while the program is running to this pin?

5) Open the window containing the Timer registers (on the View menu), single step through the code noting the point where the output on pin PA6/OC2 changes. Examine the contents of the TCNT and TOC2 registers in the Timer window. What is their relationship to the program execution?

6) What happens when the free running counter, TCNT, matches the value in the TOC2 register? What effect does this have on the code execution?

7) Using the Pink Book (Ask your demonstrator), look up the timer and output compare mechanism.

8) Examine the end of the INTERRUPTS.ASM file. What do the following lines do?

    a. ORG $FFE6
    b. FBD RTOC2
    c. ORG $FFFF
    d. FDB START

9) Why should interrupts be used within a program and what benefits do they afford? What is the advantage of using the output compare mechanism compared to a simple decrementing counter?