HW1: The Datasheet Name:

ECEN 442, Fall 2016, Homework 1 ***Due: 9/12/2016***

One purpose of this assignment is simply to familiarize you with the datasheet and technical reference manual for the DSP that we will use in the labs. Please use the datasheet and technical reference manual provided on the course eCampus page to answer the following questions. Submit the homework in class.

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1. Based on the 2nd set of lecture slides, what is the DSP core we use in the lab? (Hint: It starts with "TMS")

2. What is TI's name for the microcontroller series which includes our particular DSP? (Hint: It is 1 word with no numbers)

3. Look at Figures 4-1 to 4-4 in the datasheet, which show our DSP package. What is the name of this type of package?

4. In Table 4-1 in the datasheet, locate GPIO150. What is its ball number? What two functions is it multiplexed for?

5. Find the memory maps for our DSP in the datasheet. Based on these maps, answer the following questions:
    a. Name 3 types (not just 3 different sections) of memory available on chip.
    b. What is the size of the Boot ROM?
    c. What is the starting address for the PieVectTable?
    d. What addresses do the GpioDataRegs occupy?

6. In the technical reference manual, read section 10.1.3: ADC Configurability and answer the following questions:
    a. Which of the two signal modes (single ended or differential) can be sampled faster?
    b. What advantage of differential mode does the technical reference manual mention?
    c. For a single ended mode case, let V_{REFHI} = 3 V and V_{REFLO} = 0 V. What digital value should the ADC produce if a voltage of 2 V is applied to the input pin of the ADC?
    d. For a differential mode case, let V_{REFHI} = 3.3 V and V_{REFLO} = 0 V. What digital value should the ADC produce if a voltage of 2.0 V is applied to the positive input and a voltage of 1.3 V is applied to the negative input of the ADC?

7. The following piece of code deals with CPU Timer 2.
    a. What does each line of code do? (see section 2.14.2 CPUTIMER_REGS Registers in the technical reference manual) (Hint: One or more lines may do nothing, but you must indicate which lines do nothing.)
    b. What period (in ns) will CPU Timer 2 have after this code is done executing (assume no prescaling is done)?

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CpuTimer2Regs.TCR.bit.TSS = 1;
CpuTimer2Regs.PRD.all = 100;
CpuTimer2Regs.TCR.bit.TRB = 0;
CpuTimer2Regs.TCR.bit.TIE = 0;
CpuTimer2Regs.TCR.bit.TRB = 1;
CpuTimer2Regs.TCR.bit.TSS = 0;
```

8. Write a piece of code that starts CPU Timer 1 operating with a frequency of 125 Hz.