

### Prelab 3

1. The purpose of this lab is to help us understand the difference between functions and interrupts. Using interrupts helps us execute differential equations on the microcontroller that are time dependent. We will first cross verify software based frequency setting on an oscilloscope and will then use an oscillator source to Toggle LEDs at a particular CPU clock frequency. All of this will be done through RAM.

2. We will use the oscillator source frequency to set the clock scale factors for desired clock frequencies. Then we will compute the timer scale factors from the clock frequency output, and allow multiplexing of 192 different interrupts.

```
CLKRCCTL1.OSCCLKSRCEL = 01; // Setting clock to external oscillator
SYSPLLMULT.bit.IMULT = 0001010 // Multiply by 10
SYSPLLCTL1.bit.PLLCLKEN = 1 // Activates PLL
```

```
while (SYSPLLSTS.bit.LOCKS !=1) // wait for PLL to lock val
```

**Now we need to set the freq to 1KHz to make a square wave**

```
Cpu.Timer0Regs.PRD.all = 99; // set PRD to 1
CpuTimer0Regs.TCR.bit.TSS = 1;
CpuTimer0Regs.TCR.bit.TRB = 1;
CpuTimer0Regs.TIE = 1;
```

```
PieCtrRegs.PIECTR.ENPIE = 1; // enable PIE
PieVectTable.TIMER0_INT = &timerISR; // Create pointer to ISR
PieCtrRegs.PIEIER1.bit.INTx7 = 1; //Enable appropriate field for TIME_0
PieCtrRegs.PIEACK.all = M_INT1; //Acknowledge PIEACK
```

3. Using the formula from page 6 of lab manual, we cross multiply by the denominator on the RHS and divide by numerator on LHS to get a PRD value of 3,99,999.