

Laboratory 12: Interrupts, Tuning Fork

SIMULATION: <https://youtu.be/nsubPc6Dsu8>

HARDWARE: (I don't have the lab kit component \*audio jack\* due to sold out)

QUESTIONS:

1. What five conditions must be true for an interrupt to occur?

The five conditions are:

- Device is armed
- NVIC (Nested Vector Interrupt Controller) enabled
- Global enabled
- Interrupt priority level must be higher than current level executing
- Hardware event trigger

2. How do you enable interrupts?

Clearing the I bit in the PRIMASK.

3. Assume the bus clock is 80 MHz. What do I write into the RELOAD register of SysTick if I wish to interrupt at 10 kHz (every 0.1ms)?

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Assume the bus clock is operating at 80 MHz. The SysTick initialization executes these instructions.

```
void SysTick_Init(unsigned long period){  
    NVIC_ST_CTRL_R = 0;           // disable SysTick during setup  
    NVIC_ST_RELOAD_R = xxx;  
    NVIC_ST_CURRENT_R = 0;        // any write to current clears it  
    NVIC_SYS_PRI3_R = (NVIC_SYS_PRI3_R & 0x00FFFFFF) | 0x40000000;  
    NVIC_ST_CTRL_R = yyy;  
    EnableInterrupts();  
}
```

4. What value goes in the xxx place to make the interrupt frequency 10 kHz? Give your answer in decimal format?

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5. What value goes in the yyy place to activate interrupts? Give your answer in decimal format.