TO: Prof. Pierre-Emmanuel Gaillardon, Course Instructor
FROM: David Venegas
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SUBJECT: Pre-Lab 02 (Interrupts)

1. **What is the purpose of the NVIC peripheral?**

Nested Vectored Interrupt Controller: The primary responsibilities of the NVIC are enabling and disabling interrupts, indicating requests waiting for servicing, canceling pending interrupt requests, and establishing how multiple interrupts interact through configurable priorities.

2. **What is the difference between interrupt tail-chaining and nesting?**

On tail-chaining, interrupt handlers do not interrupt each other. Tail-chaining may use a simple save and restore mechanism for transitioning from the main thread, but it has the disadvantage of allowing a rapidly-triggering or long-running interrupt high on the hardware priority to "starve" or prevent lower interrupts from executing.

On nesting, it requires a more complex context-switch mechanism but otherwise works identically to how interrupts pause execution of the main application thread. Allowing nested interrupts introduces some complications: some interrupt tasks require uninterrupted processing without losing or corrupting data (e.g., interrupts which move data between communication peripherals). Many of these have limited buffer space and will overwrite data if the interrupt execution delays or pauses for too long.

3. **In what file are the CMSIS libraries that control the NVIC?**

CMSIS library functions in core_cm0.h simplifies configuring the NVIC.

4. **What is the purpose of the EXTI peripheral?**

Extended Interrupts and Events Controller (EXTI) peripheral allows non-peripheral sources to trigger interrupts. While its typical use is to generate interrupts from the GPIO pins of the device, it may also monitor various internal signals such as the brownout protection circuitry (low-voltage shutdown).

5. **What is the purpose of the SYSCFG pin multiplexers?**

The System Configuration Controller (SYSCFG) peripheral controls a series of pin multiplexers; the SYSCFG deals primarily with signal routing, and controls data transfer between peripherals and memory, remapping portions of memory, and some high-power communication modes.

6. **What file has the defined names for interrupt numbers?**

These numbers have conveniently been given defined names in the IRQn_Type enumeration within the stm32f072xb.h file.

7. **What file has the Vector table implementation?**

The Vector table in startup_stm32f072xb.s