ARMv7-M Mode and Privilege

Mode	Privilege	Stack pointer	Typical usage model
Handler	Privileged	Main	Exception handling.
Thread	Privileged	Main	Execution of a privileged process or thread using a common stack in a system that only supports privileged access.
		Process	Execution of a privileged process or thread using a stack reserved for that process or thread in a system that only supports privileged access, or that supports a mix of privileged and unprivileged threads.
Thread	Unprivileged	Main	Execution of an unprivileged process or thread using a common stack in a system that supports privileged and unprivileged access.
		Process	Execution of an unprivileged process or thread using a stack reserved for that process or thread in a system that supports privileged and unprivileged access.

- ARMv7-M supports two operation mode: **thread mode** and **handler mode**
  - Is entered on reset, and can be entered as a result of an exception return.
  - Is entered as a result of an exception. The processor must be in Handler mode to issue an exception return.

ARM's Processor Modes

- Except in the M-profile, ARMv4 and above processors support

Processor mode			Description
1	User	(usr)	the normal program execution mode
2	FIQ	(fiq)	designed to support a high-speed data transfer or channel process
3	IRQ	(irq)	used for general-purpose interrupt handling
4	Supervisor	(svc)	a protected mode for the operating system
5	Abort	(abt)	used to implement virtual memory and/or memory protection
6	Undefined	(und)	used to support software emulation of hardware coprocessors
7	System	(sys)	used to run privileged operating system tasks

- Some extension supports more, e.g.
  - *Monitor* mode: ARMv6 and ARMv7 Security Extensions, ARMv8 EL3
  - *Hyp* mode: ARMv7 Virtualization Extensions, ARMv8 EL2)