CHITKARA UNIVERSITY
HIMACHAL PRADESH - NAAC Accredited

Program Interrupt and Types of Interrupt

Lecture 24

Stop the current execution of program and run an Interrupt Service Routine (ISR)

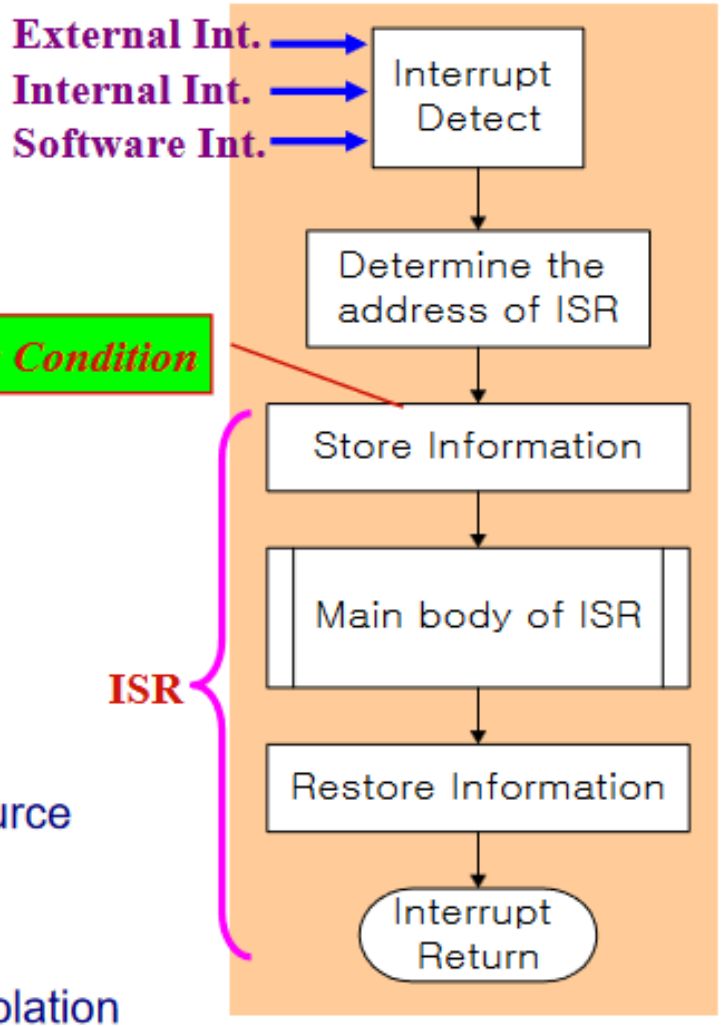
Program Interrupt

- Program Interrupt
  - » Transfer program control from a currently running program to another service program as a result of an external or internal generated request
  - » Control returns to the original program after the service program is executed
- Interrupt Service Program 과 Subroutine Call 의 차이점 (key difference)
  - » 1) An interrupt is initiated by an internal or external signal (*except for software interrupt*)
    - A subroutine call is initiated from the execution of an instruction (CALL)
  - » 2) The address of the interrupt service program is determined by the hardware
    - The address of the subroutine call is determined from the address field of an instruction
  - » 3) An interrupt procedure stores all the information necessary to define the state of the CPU
    - A subroutine call stores only the program counter (*Return address*)

- Program Status Word (PSW)
  - » The collection of all status bit conditions in the CPU
- Two CPU Operating Modes
  - » Supervisor (*System*) Mode : Privileged Instruction 실행
    - When the CPU is executing a program that is part of the operating system
  - » User Mode : User program 실행

PC, CPU Register, Status Condition

CPU operating mode is determined from special bits in the PSW



Types of Interrupts

- 1) External Interrupts
  - » come from I/O device, from a timing device, from a circuit monitoring the power supply, or from any other external source
- 2) Internal Interrupts or TRAP
  - » caused by register overflow, attempt to divide by zero, an invalid operation code, stack overflow, and protection violation
- 3) Software Interrupts
  - » initiated by executing an instruction (**INT** or **RST**)
  - » used by the programmer to initiate an interrupt procedure at any desired point in the program