Interrupts

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- Motivations
  - Inform a program of some external events timely
    - Polling *vs* Interrupt
  - Implement multi-tasking with priority support

Merriam-Webster:
   "to break the uniformity or continuity of"

Polling *vs* Interrupt
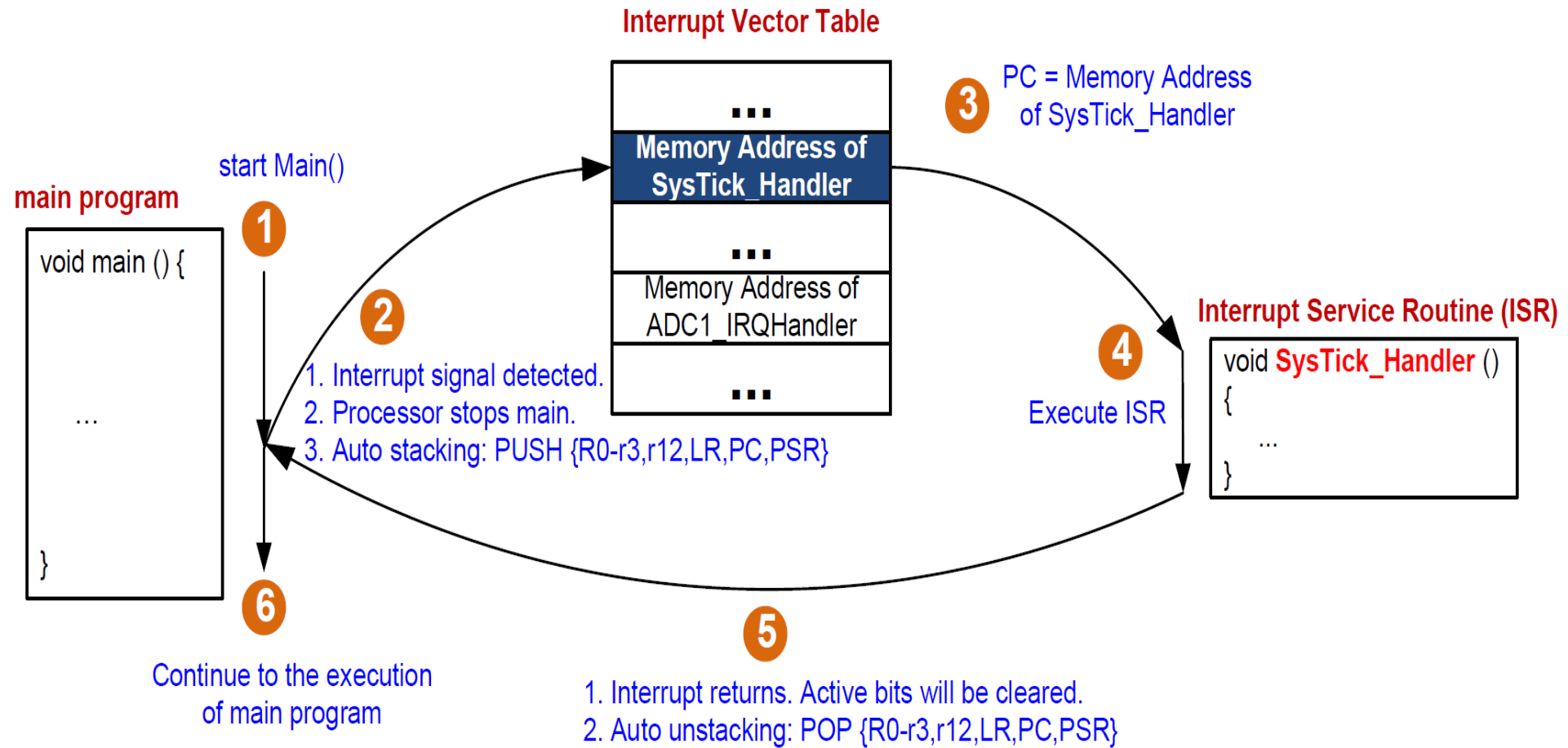

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Polling:
You pick up the phone every three seconds to check whether you are getting a call.

Interrupt:
Do whatever you should do and pick up the phone when it rings.

Image from http://vecto.rs

Interrupt

Interrupt Vector Table

start Main()

main program

void main () {

...

}

①

②

③ PC = Memory Address of SysTick_Handler

...

Memory Address of SysTick_Handler

...

Memory Address of ADC1_IRQHandler

...

1. Interrupt signal detected.
2. Processor stops main.
3. Auto stacking: PUSH {R0-r3,r12,LR,PC,PSR}

Interrupt Service Routine (ISR)

④ Execute ISR

void **SysTick_Handler** ()
{
    ...
}

⑥

⑤

Continue to the execution of main program

1. Interrupt returns. Active bits will be cleared.
2. Auto unstacking: POP {R0-r3,r12,LR,PC,PSR}

4

Stacking & Unstacking