

# 微處理機實驗

- ❑ The stack is a section of RAM used by the CPU to store information temporarily
  - This information could be data or an address
- ❑ The register used to access the stack is called the SP (stack pointer) register
  - The stack pointer in the 8051 is only 8 bit wide, which means that it can take value of 00 to FFH
  - When the 8051 is powered up, the SP register contains value 07
    - RAM location 08 is the first location begin used for the stack by the 8051

- ❑ The storing of a CPU register in the stack is called a `PUSH`
  - `SP` is pointing to the last used location of the stack
  - As we push data onto the stack, the `SP` is incremented by one
    - This is different from many microprocessors
- ❑ Loading the contents of the stack back into a CPU register is called a `POP`
  - With every pop, the top byte of the stack is copied to the register specified by the instruction and the stack pointer is decremented once

### Example 2-8

Show the stack and stack pointer from the following. Assume the default stack area.

```
MOV R6, #25H  
MOV R1, #12H  
MOV R4, #0F3H  
PUSH 6  
PUSH 1  
PUSH 4
```

#### **Solution:**

	After PUSH 6	After PUSH 1	After PUSH 4
0B			
0A			F3
09		12	12
08	25	25	25
Start SP = 07	SP = 08	SP = 09	SP = 0A

### Example 2-9

Examining the stack, show the contents of the register and SP after execution of the following instructions. All value are in hex.

```
POP      3      ; POP stack into R3
POP      5      ; POP stack into R5
POP      2      ; POP stack into R2
```

**Solution:**

		After POP 3	After POP 5	After POP 2
0B	54	0B	0B	0B
0A	F9	0A	0A	0A
09	76	09	09	09
08	6C	08	08	08
Start SP = 0B		SP = 0A	SP = 09	SP = 08

# 練習

現有數值12H、13H、14H需分別存於暫存器1、暫存器2、暫存器3中，並且利用堆疊指標使暫存器1、暫存器2、暫存器3中數值為13H、12H、14H。