T62 Tutorial 3

Write a program to perform addition of all the digits (from the first digit to the last digit) of your student ID number. Each digit is temporary stored in WREG before the addition. Each addition result (in hexadecimal) is stored in location 2**X**. **X** is the last digit of your student ID number. In the program, use the label "sum" as the memory location 2**X**. When all the additions finished, the program should show the final result forever. Your program must have sufficient comments.

1. Copy the program from the editor window.

(8 marks)

```
    LIST P=18F4520          ;directive to define processor
    #include <P18F4520.INC> ;CPU specific variable
    sum equ 28H             ;RAM location for sum
                            ;student ID number is 12345678
    org 0H                  ;start at address 0
    movlw 0x01              ;first digit
    movwf sum
    movlw 0x02              ;second digit
    addwf sum,f
    movlw 0x03              ;third digit
    addwf sum,f
    movlw 0x04              ;fourth digit
    addwf sum,f
    movlw 0x05              ;fifth digit
    addwf sum,f
    movlw 0x06              ;sixth digit
    addwf sum,f
    movlw 0x07              ;seventh digit
    addwf sum,f
    movlw 0x08              ;last digit
    addwf sum,f
B1: goto B1
    end
```

2. Copy the contents of WREG and sum when all the additions finished. In watch window, click "Add Symbol" button to select user defined label.

(4 marks)

Address	Symbol Name	Value
FE8	WREG	0x08
028	sum	0x24

Write a program to send 8 groups of hexadecimal numbers (A**X**) to PORT C. **X** is one digit (from the first digit to the last digit) of your student ID number. These 8 groups of hexadecimal numbers are defined as constants (labeled as group 1 to group 8) using cblock. In the program, each group of hexadecimal numbers is temporary stored in WREG before output to PORT C. When all the outputs finished, the program should show the final contents of WREG and PORT C forever. Your program must have sufficient comments.

3. Copy the program from the editor window.

(8 marks)

```
    LIST P=18F4520          ;directive to define processor
    #include <P18F4520.INC> ;CPU specific variable
                            ;student ID number is 87654321
    org 0H                  ;start at address 0
    cblock 0xA8             ;define a list of named constants
        group1: -1,group2: -1,group3: -1,group4: -1
        group5: -1,group6: -1,group7: -1,group8
    endc
    movlw 0x00
    movwf TRISC,0           ;set PORT C to output
    movlw group1
    movwf PORTC             ;output group1
    movlw group2
    movwf PORTC             ;output group2
    movlw group3
    movwf PORTC             ;output group3
    movlw group4
    movwf PORTC             ;output group4
    movlw group5
    movwf PORTC             ;output group5
    movlw group6
    movwf PORTC             ;output group6
    movlw group7
    movwf PORTC             ;output group7
    movlw group8
    movwf PORTC             ;output group8
B1: goto B1
    end
```

4. Copy the contents of WREG and PORT B when the program finished.

(4 marks)

Address	Symbol Name	Value
FE8	WREG	0xA1
F82	PORTC	0xA1