**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(0)**. **X(0)** is the last digit of your student ID number. In the program, use the label “**sum**” as the memory location 2**X(0)**. 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

#include <P18F4520.INC>

ORG 0x0000

Sum EQU 0x20 ;Sum @location 0x20

MOVLW 0H ;set w = 0

MOVWF Sum ;move w to sum

MOVLW 5H ;set w

ADDWF Sum ;add w to sum

MOVLW 6H ;set w

ADDWF Sum ;add w to sum

MOVLW 0H ;set w

ADDWF Sum ;add w to sum

MOVLW 4H ;set w

ADDWF Sum ;add w to sum

MOVLW 6H ;set w

ADDWF Sum ;add w to sum

MOVLW 6H ;set w

ADDWF Sum ;add w to sum

MOVLW 8H ;set w

ADDWF Sum ;add w to sum

MOVLW 0H ;set w

ADDWF Sum ;add w to sum

Result: GOTO Result ;stay here forever

END

* 1. 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 | 0x00 |
| 020 | Sum | 0x23 |

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 **group1** to **group8**) 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.

* 1. Copy the program from the editor window.

(8 marks)

LIST P=18F4520

#include <P18F4520.INC>

ORG 0x0000

CBLOCK 0xA5 ;56046680

group1: 1, group2: -6, group3: 4, group4: 2

group5: 0, group6: 2, group7: -8, group8

ENDC

MOVLW 00 ;set w = 0

MOVWF TRISC, 0x00 ;protc i/o setting

MOVLW group1 ;group1 A5, move group1 to w

MOVWF PORTC ;move w to portc

MOVLW group2 ;group2 A6, move group2 to w

MOVWF PORTC ;move w to portc

MOVLW group3 ;group3 A0, move group3 to w

MOVWF PORTC ;move w to portc

MOVLW group4 ;group4 A4, move group4 to w

MOVWF PORTC ;move w to portc

MOVLW group5 ;group5 A6, move group5 to w

MOVWF PORTC ;move w to portc

MOVLW group6 ;group6 A6, move group6 to w

MOVWF PORTC ;move w to portc

MOVLW group7 ;group7 A8, move group7 to w

MOVWF PORTC ;move w to portc

MOVLW group8 ;group8 A0, move group8 to w

MOVWF PORTC ;move w to portc

Result: GOTO Result ;stay here forever

END

* 1. Copy the contents of WREG and PORT C when the program finished.

(4 marks)

|  |  |  |
| --- | --- | --- |
| Address | Symbol Name | Value |
| FE8 | WREG | 0xA0 |
| F82 | PORTC | 0xA0 |

**Submission**

Enter your name, student ID number, and the answers in the MS Word document file. Re-name the file with your student ID number, e.g. 12345678.docx. **Deduct 4 marks for wrong file name.**

Submit the file by e-mail ([itklchan@cityu.edu.hk](mailto:itklchan@cityu.edu.hk)) before 3:00 pm. **Late submission will not be accepted.**