Parallel I/O Interfacing

Objectives:

- Study programmable parallel I/O ports on the PICDEM2 Plus board
- Interface external devices (LEDs and switches) with the programmable parallel I/O on the PICDEM2 Plus board.

Materials:

Software : MPLAB IDE software
Hardware : PICDEM2 Plus Board
LED, DIP switch and resistors

Task 1

1. Hook up the PICDEM2 board to the computer via ICD2 interfacing tool.
2. Check the board functionality and connectivity to PC before proceed further.
3. Construct the circuit shown in Figure 1. You should **switch OFF the power supply on the PICDEM2 board** before doing any connection.

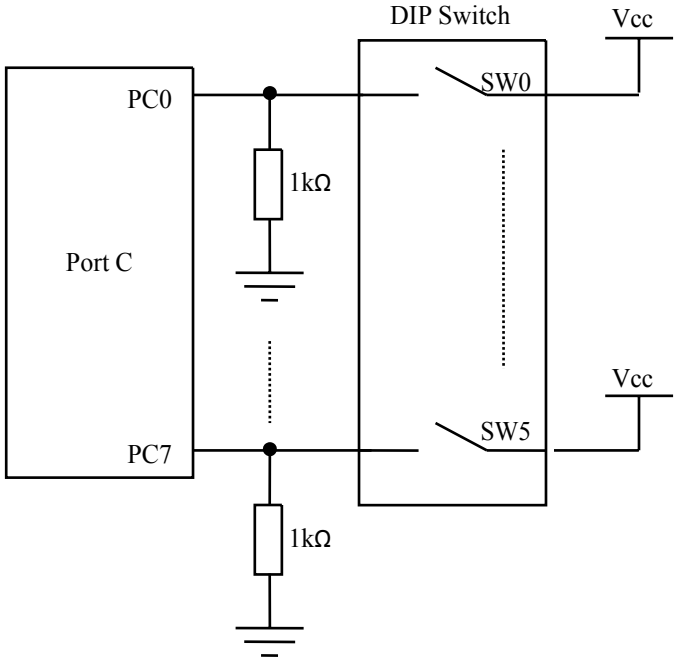

Figure 1

4. Write a program to read the logic levels from the DIP switch. The input data is required to store into a data memory location at 0x0FF. (Note: Set the ON-OFF levels of the DIP switch arbitrarily to verify the functionality of the program)

5. Retain the circuit in previous section. Then, construct the circuit shown in Figure 2.

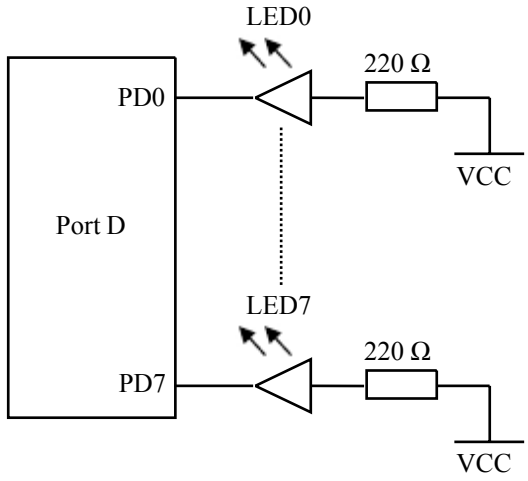

Figure 2

6. Write a program to make the LEDs blink in an alternate sequence. You can achieve the blinking effect by using some output data such as 0x0AA and 0x055 in orderly sequence. (Note: You should apply a suitable "DELAY" sequence between the output data in order to visualize the blinking effect)

Task 2

7. By using both circuits in Figure 1 and Figure 2, write a program to read the logic levels from the DIP switch and output the reading via LEDs. Then, observe the changes of LEDs. Are the changes of LEDs coherent with the changes of the DIP switch? _____

Task 3

8. Students are required to write a program that function a 8-bits UP DOWN Binary Counter. By using the circuit in Figure 1, assign a switch as COUNT SEQUENCE SELECTOR (CSS) to select the count UP with the logic 1and count DOWN with logic 0. The counter should continue from its current counting state when the counting status changes from UP to DOWN or vice versa. Display the output of the counting sequence via LEDs in Figure 2. Repeat the sequence after the counting overflow. Students should include a delay sequence of at least 0.5 seconds to each counting interval in order to capture the changes of the counting sequences.

Note: All programs MUST include with the following items:-

- Defining necessary labels
- Description for every line of instructions

All programs MUST be verified by the lecturer. At the end of this experiment, the softcopy of the programs are required to submit to the lecturer.