

# EE 337: Introduction to the Pt-51 Kit

## Lab 3

This set of experiments has the following objectives:

- Familiarization with Pt-51 kit and simple peripherals.

You should browse through the manual for Keil software, the data sheet for 89C5131A, and the Pt-51 user manual which are available at [wel.ee.iitb.ac.in](http://wel.ee.iitb.ac.in). The instructions for installing flip on windows is available in the website and on moodle. Instructions for installing flip in Ubuntu is uploaded on moodle separately. You should come to the classroom with laptop and the Pt-51 kit. You will be required to write programs and run them on the kit during the session.

## 1 Homework

### 1.1 Problem 1: Port I-O

Write a subroutine `readNibble` (as per the template given) to read the binary value which is set on port pins P1.3-P1.0. To test this subroutine, the main program should initially set the pins P1.7-P1.4 and wait for 5 seconds. During this period the user can change the values on pins P1.3-P1.0. Then use `readNibble` to read the port pins and display this value on pins P1.7-P1.4 for a period of 5 seconds. The nibble should also be stored in the last four bits of location `4EH`.

Once it is displayed, the program should clear pins P1.7-P1.4 for 1 second and call `readNibble` again to read the port pins. If the read value equals `0FH` the program should display the value stored in `4EH` on P1.7-P1.4 for 5 seconds. If the user does not change the value on pins P1.3-P1.0 ( i.e. it remains at `0FH`), continue displaying the value stored in `4EH`. Otherwise, display the new value on pins P1.7-P1.4.

```
readNibble :
; Routine to read a nibble from the user
; First configure P1.3-P1.0 as input
; To configure a port pin as input, set it.
; Write logic to read a 4 bit number (nibble P1.3-P1.0)
loop:
; Set pins P1.7-P1.4 (indication that routine is ready to accept input)
; wait for 5 sec during which user can give input
; Clear pins P1.7-P1.4
; wait for one sec
; read the input on P1.3-P1.0 (nibble)
value_changed:
; show the read value on pins P1.7-P1.4
; wait for 5 sec
; clear pins P1.7-P1.4
; read the input on P1.3-P1.0
```

```

; if read value != 0Fh go to loop
display_old:
; otherwise display previously stored nibble from location 4EH
; wait for 5 seconds
; read the input on P1.3-P1.0 (nibble)
; if it is still 0FH go to display_old
; else go to vlaue_changed

```

Above code template is attached with Homework3.zip as hw3.asm.

**Note:** You should push / pop all registers being used in the algorithm.

## 2 Labwork

### 2.1 Problem 1: Port I-O using the Pt-51 kit

You will be required to use the `readNibble` subroutine described earlier to write a program. The template for the program will be uploaded on moodle.