**Topic:** Interfacing Input-Output

**Pre-requisites:** IO Programming

**Components Required:** Fire Bird V Robot with 8051 Adapter Board

**BASIC INTRODUCTION:**

* **What do you mean by IO Interfacing?**

IO interfacing is the communication between a system (such as microcontroller) with the outside world or some Input/output device.

* **Input/output device-** A device that gives data to the microcontroller as input is called an input device and which takes data from the microcontroller as output is known as output device. For example- keyboard is an input device and printer is an output device with reference to computer.
* **Ports-** Ports are the junctions to connect input-output devices to computer/microcontroller. 8051 has 4, 8 bit general purpose IO ports from P0 to P3. A port can be set as input or output port by initializing it with logic 1 or 0 respectively.

Let’s see few examples on initializing ports.

**Problem1:** Set Port 0 as an Input port and store its value in the variable k.

**Solution:**

{

**int** k;

P0=0xFF;

k=P0;

**While (**1**);**

}

**Problem2:** Set the 4th bit of Port 3 ( i.e. P3.3 ) to logic 1

**Solution:**

{

P0^3=1;

**While** (1);

}

Now I hope that you understood the basic concept.

**Note: For more details, you can refer to 8051 Software manual section 3**.

Now the most basic IO operation is buzzer control.

**INTERFACING BUZZER IN 8051**

In Fire Bird V, buzzer is situated on the main board and connected to the 7th pin of Port2.

To turn buzzer off apply logic 1 to the P2.7.To turn it on we have to set P2^7 to zero.

**Problem:** Program the robot to blow buzzer for 1 sec.

**Solution:**

We already know the logic behind blowing of buzzer so now we just need to write the algorithm for it.

1. Set P2^7 to zero to blow the buzzer.
2. Give delay of 1 sec
3. Stop the buzzer by setting P2^7 to one.
4. End

**Note: Reference code for the above is given in experiments folder.**

**We can also interface LED in a similar manner.**

**Example:** Let’s say LED is connected to 1st pin of port0 then to glow it we can write algorithm as follows:

1. Set P0^0 to one to glow LED.
2. Give delay for some time. //time for which you want to glow led.
3. Set P0^0 to zero to stop.
4. End

**Extension:**

1. Program the robot to blow buzzer continuously with a delay of 1 sec in between every 2 consecutive beeps.
2. Program the robot to glow led for 1 sec.
3. Program the robot to blow buzzer when switch is pressed. When switch is released it should turn off.