LESSON 7: Accessing the Real World

# Exercises 5: First Exercise on Hardware: LEDs >Documentation

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link: https://dcsit.twiki.ucc.edu.gh/do/view/UCC\_Course/LedDisplay

**Goal:**

*The exercise session was aimed at introducing how to program the Raspberry Pi using LEDs and how to setup our first electronic circuits, and control them through the Raspberry Pi*

## Exercise 1: Testing the LED

The current flowing through the LED was calculated to be 0.01A assuming the resistance of the LED was negligible. The LED was connected to Vcc=3.3V on the breadboard in order to test if it was working. It was then connected to GPIO pin #17 on the breadboard in for it to communicate with the Raspberry Pi.

**Exercise 2: Connect the LED to the GPIO pin**

The wiringpi package was installed for us, which contains libraries for access to the GPIO pins but also to the SPI and [I2C](https://dcsit.twiki.ucc.edu.gh/do/view/UCC_Course/I2C) serial interfaces. This package contains in addition to the library and include files a new command *gpio* allowing us to talk to a gpio pin. We then have to define this pin to be output and the write 0 or 1 to it .

## Exercise 3: Shell script to make the LED blink

## A shell script named “blink.sh” was created to make the LED blink forever. The “gpio” command was used here.

## **Exercise 4: Write a C program to make the LED blink**

A “C” program was then written to make the LED blink. But here a library known as “wiringPi” was used here. In that library a function named “wiringPiSetup()” was used to initialize the “wiringPi” library for other functions to be used. A Makefile was then written to compile the program. The command “-lwiringPi” was used to to link the “wiringPi” library to the program written.

## **Exercise 5: Implementing your own gpio command**

A “C” program was written in order to implement the “gpio” command. This program had command line parameters “read”, “write” and a “pin number”

## **Exercise 6: Make your LED blink SOS**

An SOS program was then written in “C” to blink the LED as required.

**Remarks**

This exercise session I learnt how to operate a simple LED using the gpio command and also how to write a bash script program.