Lab Sheet: LCD display

This lab sheet covers the usage of a small 16×2 LCD display as an output device, as discussed in the Tutorial on LCDs. You should use the wiring that is described in the CW2 specification.

Code samples

Start with downloading the following code samples from the slides:

- `lcd-hello.c`
- `lcdBinary.o`

Compile `lcd-hello.c` and link it with the `lcdBinary.o` binary that contains the low-level code:

```
> gcc -w -c -o lcd-hello.o lcd-hello.c
> gcc -o lcd-hello lcd-hello.o lcdBinary.o
> sudo ./lcd-hello
```

You can also get this sample source code from this gitlab repo

Use the wiring that is discussed in the CW2 spec, or in the Tutorial on LCDs. When you run the program, you should see the message "Hello world" on the display.

Display the current time

In order to display some useful information, rather than just a hello-world message, display the current time and keep updating it. Use the function `localtime` to get the time, and check its man page to find out how to extract hours, minutes and seconds from the data structure. You'll have to include the header file `time.h`. You should update the displayed time in an infinite loop at the end of main. You probably want to use a `delay` command to control the speed of scrolling.

A scrolling message

Extend the code in `lcd-hello.c` by defining a message that is longer than 16 characters (and thus doesn't fit on one row), and make the message scroll on the display. You should do this in an infinite loop at the end of main. You probably want to use a `delay` command to control the speed of scrolling.

You can get template code for the scrolling message exercise from this gitlab repo.