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| Heriot Watt University |
| Mastermind Application |
| F28HS – Coursework 2 |

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# Problem specification:

Mastermind is a 70s board game which consists of a player creating a code and a player trying to break the code. This project consists of building mastermind on the Raspberry Pi, where a sequence of colourful pegs would instead be a sequence of numbers. The Raspberry Pi would act as the “code master”, making a random code at the start of each game.

The game progresses in rounds of the player or “code breaker” guessing the code. The code is guessed by pressing a button. After each input the raspberry pi confirms the users input through flashing LEDs.

At the end of each round, the code master communicates through LEDs the amount of exact or approximate matches. It must also communicate the start of a new round. The game continues in this routine of rounds until the code breaker correctly breaks the code.

This project must also include a debug mode which displays the secret code, the inputs and the outputs on the command line.

# Hardware specification and wiring used:

The hardware used includes a Raspberry Pi 2 model B, a red LED, a yellow LED (originally specified to use a green LED, but due to not having a green LED a yellow one was used instead), a button, three resistors, a bread board, five male/female connector cables and and four male/male connector cables. The five male/female connector cables are used to connect the Raspberry Pi with the breadboard. The red LED is connected to the GPIO pin 5 of the Raspberry Pi, the yellow LED is connected to the GPIO pin 6 of the Raspberry Pi and the button is connected to the GPIO pin 19 of the Raspberry Pi. The last two male/female connector cables are connected to the Raspberry Pi’s power pin and ground pin.

On the breadboard, the LEDs and button is connected to the corresponding cables coming from the Raspberry Pi. Each LED and the button also has a resistor connected to it through to breadboard.

See appendix for images.

# Code structure:

TODO SEE COMMENTS

# Functions that interact with the hardware:

TODO SEE COMMENTS

# Debug mode:

Sample execution of the program in debug mode.

# Summary:

This project managed to achieve almost everything requested. The downfall has been the LCD screen that we were unable to implement this part of the project. With more time we believe this would be achievable. Apart from not being able to complete the task perfectly, we feel that we have managed to learn a lot about C, assembly, and the raspberry pi in general. It has sparked our interest in the Raspberry Pi, and we have since searched online for prices of the new Raspberry Pi 3 model B and are considering buying it.

The hardest part was the assembly. If it wasn’t for being able to get help from fellow students, it would have been impossible.

# Appendix:

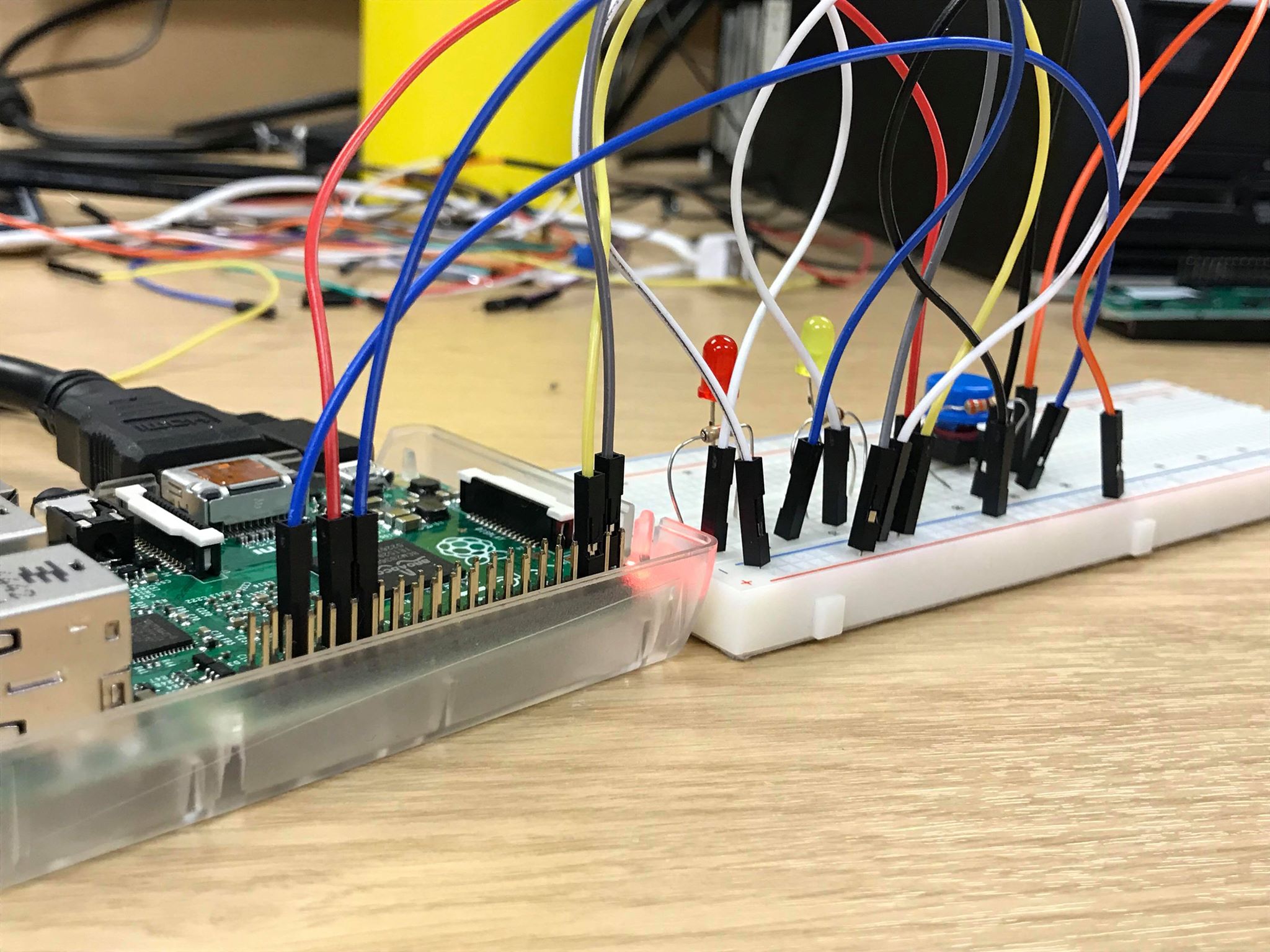


Figure 1: Side view of wiring

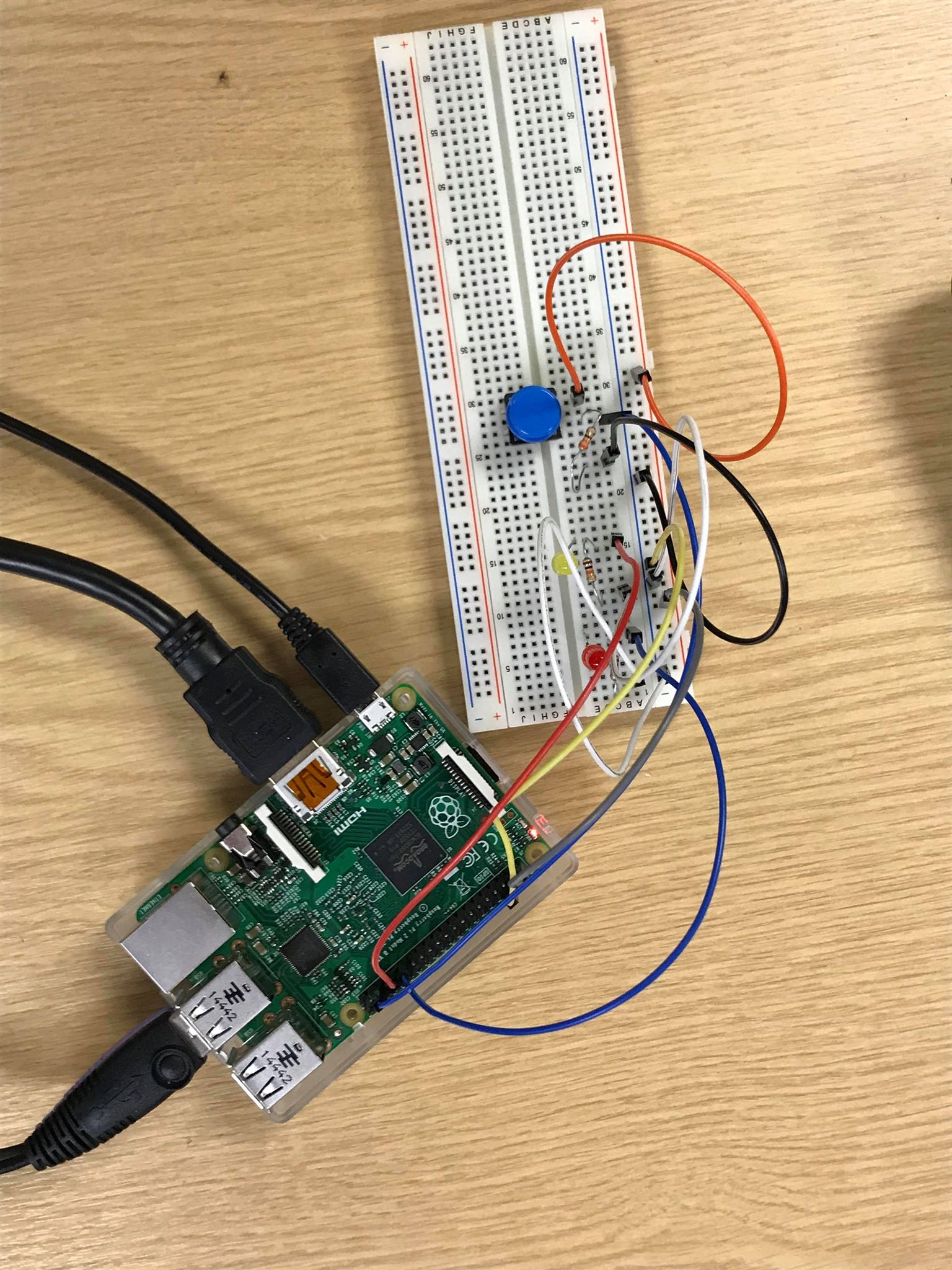


Figure 2: top down view of wiring