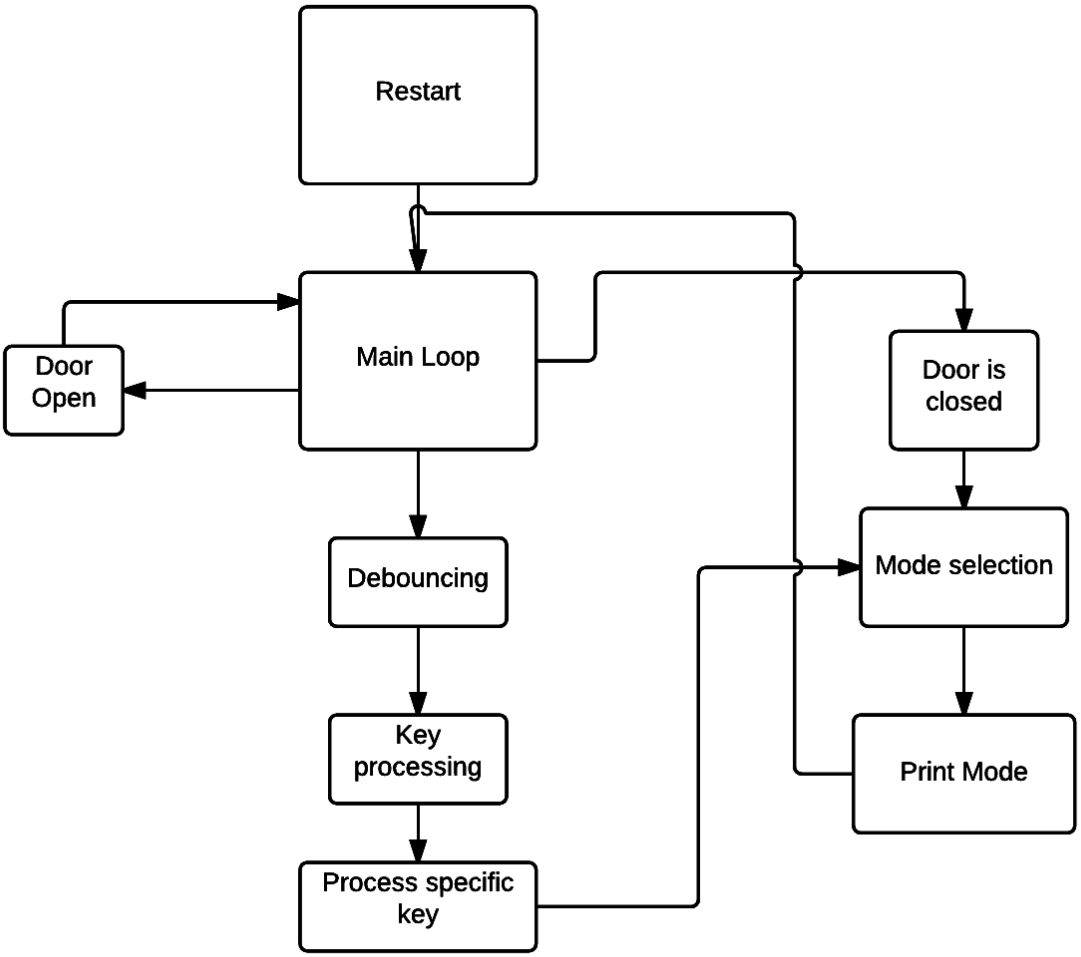
Design Manual

CS2121 - Microprocessors and Interfacing

Major Project
Microwave Simulator
Fraser Metcalf and Andrew Bennett

System Flow Control Diagram

See below a diagram of the way the code flows between modes



Data Structures

Initially we had intended to use just two registers, using individual bits to denote specific things, however this did not prove viable as this proved too difficult to implement on my own. So instead I elected to use various registers to denote things like power level and the mode. This was incredibly wasteful, however the time that would have been required in order to achieve storage in data memory was simply too great.

Algorithms

The only real algorithms that were used in this simulation have already been detailed in the various diagrams presented. There was a specific method of processing the key presses that we learnt in lectures however this probably does not warrant note except to say that it was this we implemented

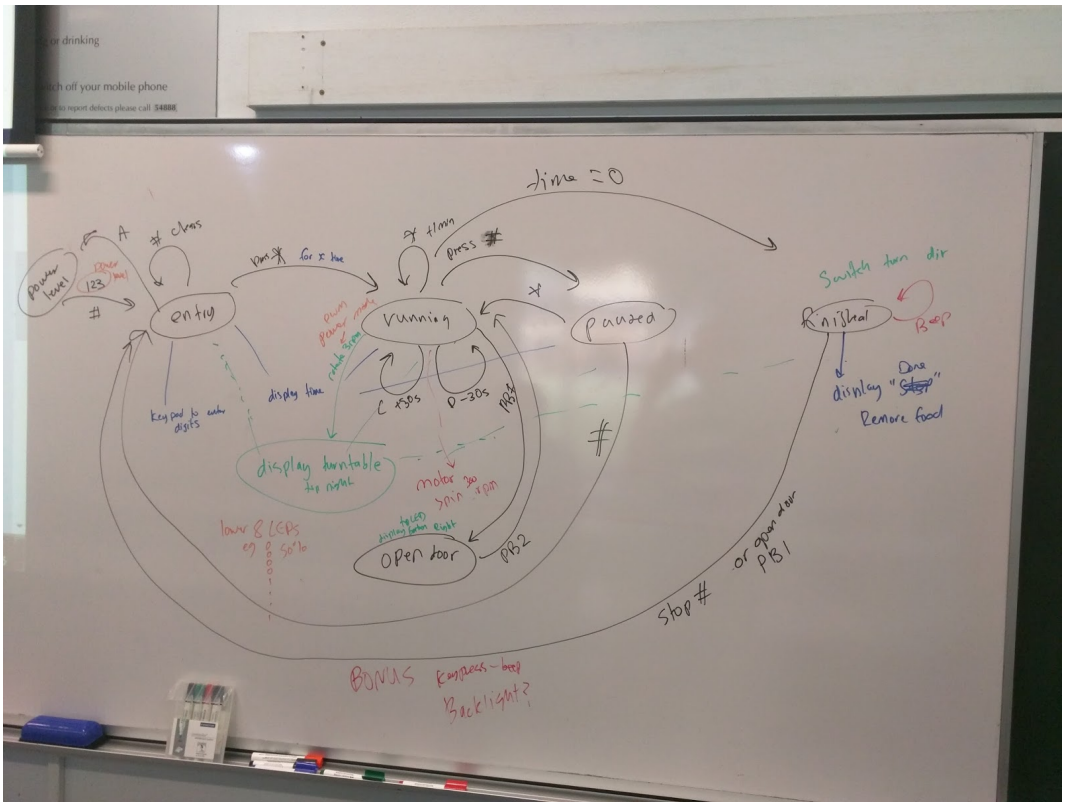
Module Descriptions

The program did not actually employ any modules, it may have, had I had the time to complete the rest of the specifications. As this was unfortunately not the case the entire program was in one file. Instead what is located here is a description of the various macros used, for ease of reference.

The do_lcd_command macro, shockingly, outputs a specific command that can be used to create something like a newline on the LCD screen. This macro is standard and was provided by the course.
The do_lcd_data macro will load a specific register into the LCD screen. This was achieved using the mov command. This macro is standard and was provided by the course.
The load_lcd_letter macro uses the ldi to output a specific character onto the screen. This macro was modified from the previous for one for the labs, and kept for future use.

All other calls or the like do not require input or and special consideration

Appendix



Initial state diagram created using the spec

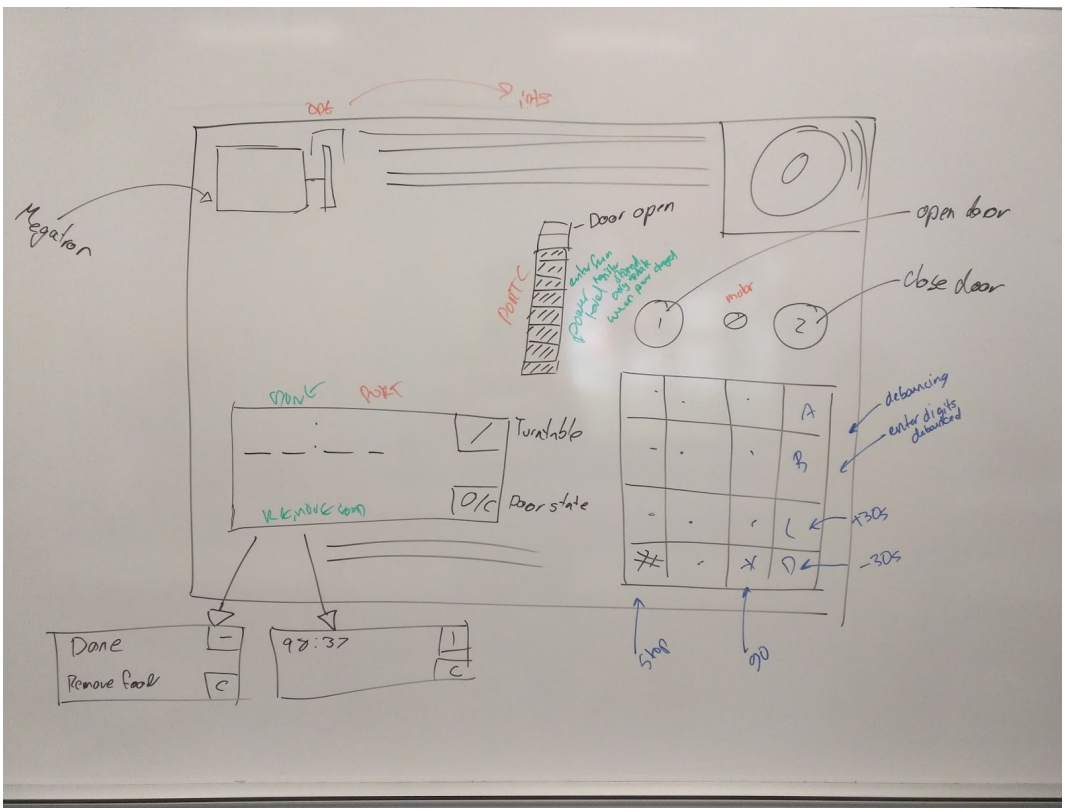
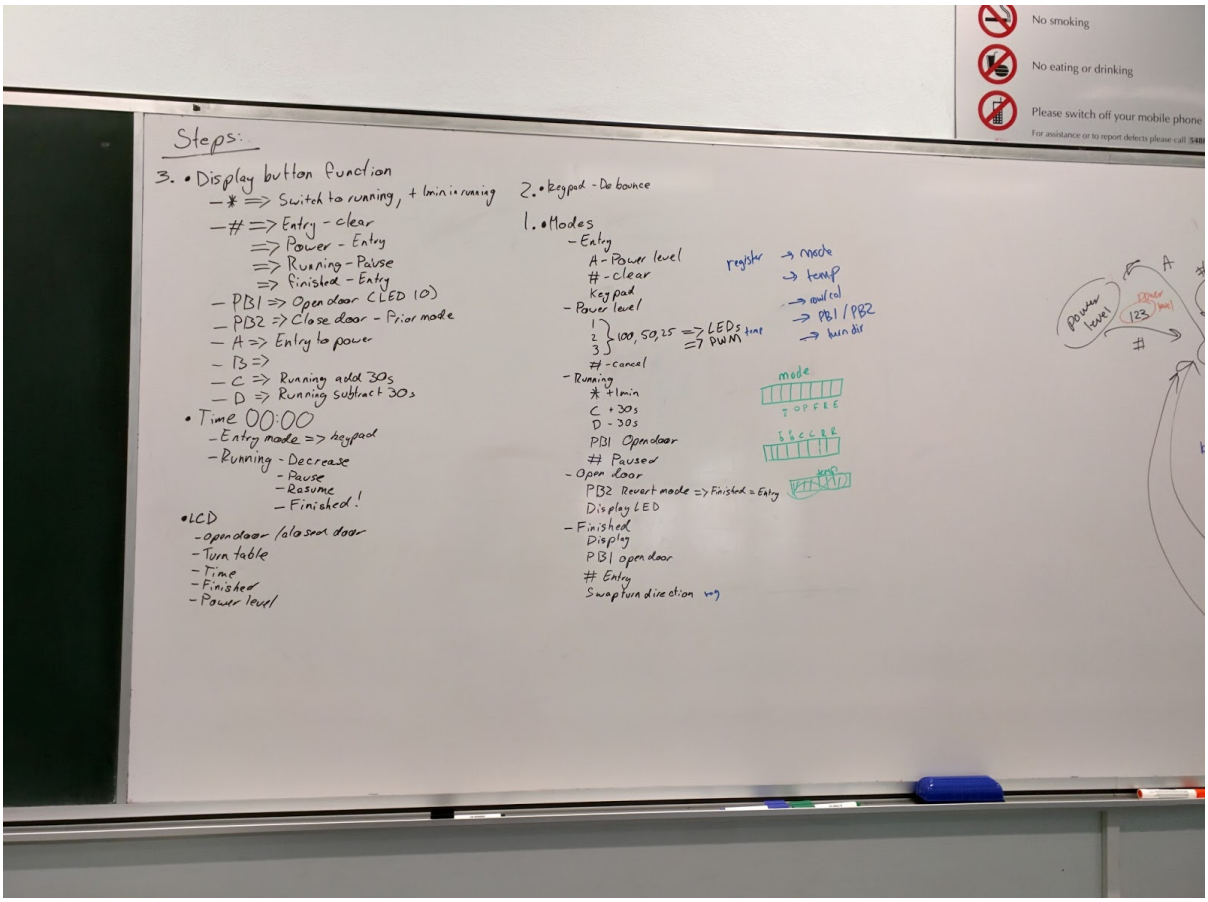


Diagram of the board and what each part would be doing



Assorted thoughts on how each part should behave. Note here can be seen initial register planning