

# Meeting Minutes – Group 5

Location: o B 6

16 March 2023, 13:30–16:00

## Present

Mark Mizzi  
Damjan Filipovic  
Gabriel Apap

## Discussion

1. Minutes from the previous meeting were read and approved.
2. Matters arising out of minutes
  - a) Clarification was made about what functions of the queue must be thread safe. It was erroneously stated that only the pop command must be thread safe however it was resolved that the push command must be too.
3. Progress report from group members
  - a) Mark researched into assembly instructions and while doing so implemented the lock free queue. He has also been mocking the DAC driver design that was theorised using POSIX facilities.
  - b) Damjan worked with Mark on the lock free queue.
  - c) Gabriel looked into the LCD driver and has understood how the LCD micro-controller works. While this is useful for the project it is mostly unnecessary for the rest of team to commit time to researching and understanding this given that we are already provided an LCD driver.
4. Brief discussion of lock-free queue and atomic test-and-set implementation.
  - a) Lock free queue was implemented with 2 functions, en-queue and check\_and\_de-queue both as atomic functions written in inline assembly. Mark explained to us the various checks put in place to ensure data corruption, out of order tone production or other system malfunctions do not occur.
  - b) The system includes a global flag that is used to determine whether a tone is being generated. Since this can be modified by multiple "threads" in execution it has to be accessed using a piece of inline assembly that implements atomic test and set.
5. Discuss meeting for labs.

It was decided that Tuesdays at 9AM will be the start of our lab sessions, that will be done as a group.
6. Finish IDE setup.

The IDE setup was finalised and the C11 standard was chosen for the project.
7. Other matters.

- a) Mark showed his progress on the DAC driver. He experimented with duplicating the code for the timer interrupt handler and created a dispatch table to pick the right interrupt handler when starting tone generation. From these experiments it was determined that duplicating the code for the handlers increases performance while generating a smaller binary than an approach that uses a look up table for each tone.

## Actions

1. Understand provided LCD Driver

Assigned to: **Gabriel Apap**  
Deadline: **Next Meeting**

2. Look into timer enable/disable and setting timer handlers

Assigned to: **Mark Mizzi**  
Deadline: **Next meeting**

3. Look into keypad and persistent storage driver

Assigned to: **Damjan Filipovic**  
Deadline: **2 meetings time**