

CM10194 Computer Systems Architecture 1 - Coursework 2

Set: Monday 11/11/2019

Due: Monday 09/12/2019, 20:00 (video + code + mini report + contribution) submission on moodle.

Learning Outcomes:

By the end of this coursework you will be able to work in pairs to create a prototype of an idea with an Arduino board, including designing and developing a communication solution.

Description:

This assignment is to be completed in pairs (2 students from the same lab, but different pairs from coursework 1 – see below “Forming your group”)

This coursework consists of developing a project that uses 2 Arduinos that communicate to each other in some way. This involves you doing some research and thought in how to make them communicate in a meaningful way, including looking at the Arduino language reference and forum. By meaningful communication we mean the exchange of data between two Arduinos to share information, control boards remotely, or extend a board’s functionality. You should be able to explain why your solution could not work with a single Arduino and/or benefits from the use of 2 Arduinos.

You will need to specify a problem, develop a solution for it and test it.

Submission:

The coursework should be submitted via Moodle as a .zip file that includes a video, the complete code and a pdf report. Only one group member should submit the coursework.

This must consist of:

1. A short (less than a minute) video with audio/written comments of your implementation, showing what it does and how. Your video should be under 30MB - if you need to compress it, you can use any software such as <http://www.squared5.com> or <http://handbrake.fr>. The .avi, .mkv or .mp4 file types are recommended.
2. All code used, with appropriate commenting. These should be your .ino files, not text files (in case you use an external library, do include the code of this library when submitting your code)
3. A short report (maximum 2 pages) to explain your implementation. Report **must be in PDF format**. At a minimum, your report should include an introduction to the project including the problem specified, a description of how it is implemented, and how it works.
 - a. Please add an appendix (as a third page to the report) which shows a **clear** photo of your solution. Extra marks will be given for the inclusion of a schematic of your solution, which can also be included in the appendix. You can use online tools such as <https://en.freownloadmanager.org/Windows->

[PC/Fritzing-FREE.html](https://en.freedownloadmanager.org/Mac-OS/Fritzing-FREE.html) (for Windows) and or <https://en.freedownloadmanager.org/Mac-OS/Fritzing-FREE.html> (for Mac).

This appendix should not be more than 1 page.

- b. The full report will then have a maximum of 2 pages + 1 for the appendix.
4. A separate file named contribution (in pdf format) where you state the % of individual contributions. For example, Bo Peep: 50%; Buzz Lightyear: 50%. We would expect this to be around 50% for each member if they equally (or approximately equally) contributed for the submission. In cases where this distribution is significantly unequal (if the difference is greater than 20%), each member should write a short paragraph where they state the reasons for that (to clarify, up to 60/40 there's no need for justification; above that (say 70-30) please each member write a short a paragraph).

You should upload these (video, code, report and contribution) as a **single zip file**.

Requests for extensions should be made to the Director of Studies. Tutors cannot approve extensions.

It is your responsibility to check that your submission is correct. Once you have submitted to Moodle you should download your submission and **check it**. Submission is anonymous, so do not include your name in your code, report, video, or file names (the only exception being the content of the contribution file which we'll only read after marking the work). The fact that the submission is anonymous means we cannot contact you if there is a problem with a submission, **so it is doubly important to follow the instructions and check it!**

The deadline is strict! If you submit after the deadline, University rules will apply. Please check "Late submission of coursework" rules on Computer Science Undergraduate Programmes Handbook: <https://moodle.bath.ac.uk/course/view.php?id=1358>

Forming your group

You must find a different partner to the one you worked with in coursework 1. Both students should belong to the same allocated lab as you can use the lab to work on your solution. In exceptional circumstances we will allow students from different labs to work together - labs have a maximum capacity limit and we cannot go over that.

You can either choose your partner or, if you prefer, you can be allocated to work with another student.

Option 1: Choose your own partner:

You and your partner must go to moodle and sign up to the same group via the "Coursework 2 pairs sign-up" link under coursework 2 section.

Option 2: Ask to be allocated to a partner:

Please complete this form <https://goo.gl/forms/4kJY8tMqLWJlblyZ2> so we know you want us to find you a partner.

Assessment:

This coursework is worth 15% of your CM10194 overall mark. Your work will be assessed (out of 100) on three criteria:

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| 1) Solution + Presentation | 50 marks | Solution works according to your own specified requirements, calibrated according to challenge of the problem. Demo is well executed. Shows clear understanding of the solution. |
| 2) Code | 25 marks | Clear code. Appropriate comments, names of functions and variables. Easy to understand. |
| 3) Mini-report | 25 marks | Clarity and conciseness of communication; appropriate presentation (written, graphic, etc). Photo of the solution. Includes reference sources if necessary. |

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Marking scheme

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| 80-100 | Outstanding. Outstanding performance that fulfils and exceeds designated outcomes | Demonstrates a deep understanding of the subject matter that indicates the student is already thinking at a high level for what is expected at this stage. Informative and compelling efforts to build and demonstrate a prototype product. Successful development of a creative product that uses the Arduino platform to solve the specified problem. Clear and readable code with comments that help understand the software, demonstrating an excellent understanding of good programming practices. Outstanding report writing skills. |
| 70-79 | Excellent. Excellent performance relative to designated outcomes | Shows comprehensive understanding of the subject matter covered in the assessment with a facility for applying the concepts to examples of the student's own investigation or conception. Informative and convincing efforts to demonstrate a prototype product. Successful development of a creative product that uses the Arduino platform to solve the specified problem. Clear and readable code with comments that help understand the software. Excellent report writing skills. |
| 60-69 | Very good Pass. Very good performance relative to designated outcomes | Shows broad understanding of the subject matter covered in the assessment and has mostly applied it correctly or sensibly. Competent efforts to build, and demonstrate a prototype product that uses the Arduino platform. Code is well structured or well documented. Good report writing skills. |
| 40-59 | Pass. Satisfactory or good performance relative to designated outcomes | Shows understanding of the subject matter, but with some parts which need attention. Earnest efforts to demonstrate a prototype product that uses the Arduino platform to solve each problem. An attempt to write good software, but with a number of problems. Code has a minimal structure and/or documentation. Satisfactory report writing skills. |
| 20-39 | Fail | A failure to meet the assessment criteria for the piece of work, either through consistently poor execution, comprehensive misunderstanding of the assignment or a failure to address what was asked. |
| 0-19 | Fail | A failure even to approach the learning outcomes for the assessment criteria. Significant portions of the assessment either not present or not comprehensible. |