LCOM

Information for the semester

Francisco Maia - Fevereiro 2025

Lecturers and TAs

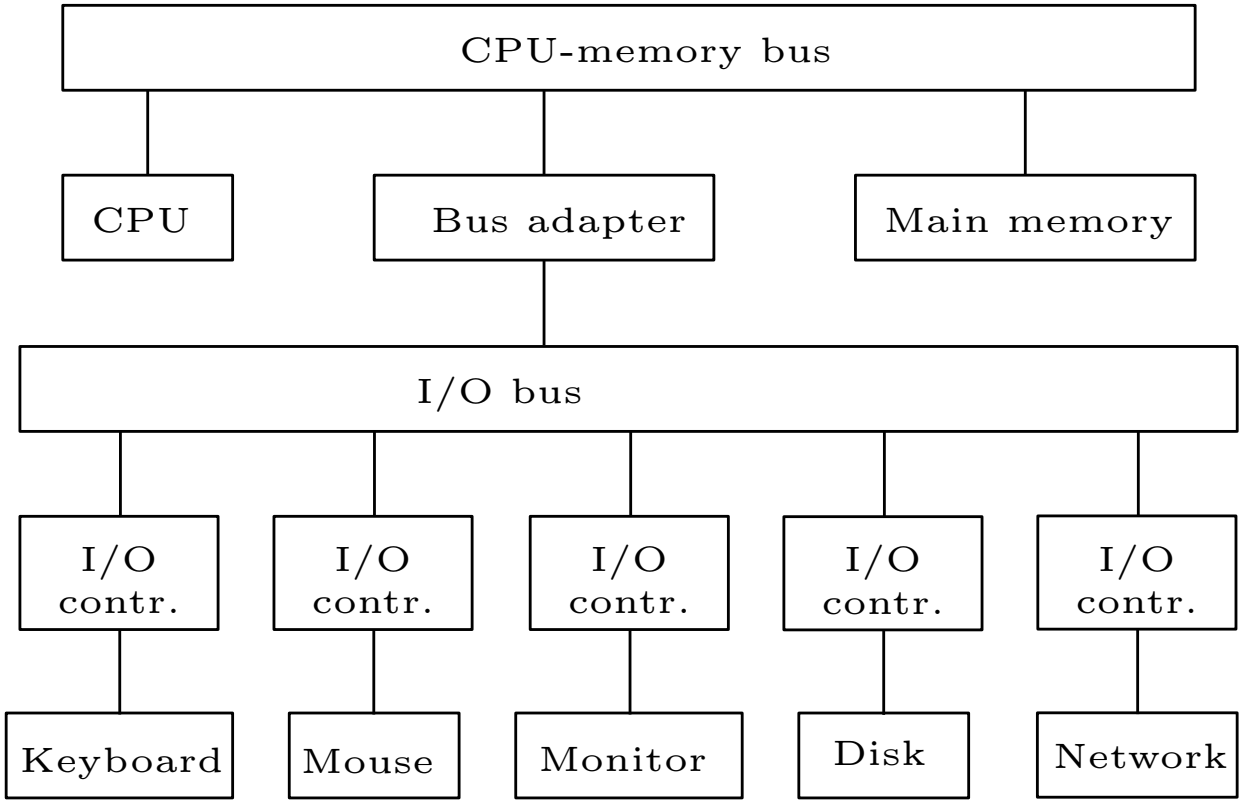
- **Francisco Maia - franciscomaia@fe.up.pt (please use "[LCOM25]" in your subject)**
- Mário Miguel Fernandes Cordeiro
- Sara Filipa Couto Fernandes
- Jorge Henrique Santos Oliveira
- Ricardo Jorge Teixeira de Sousa
- Guilherme Rosas Borges
- Simão Paulo Rato Alves Reis
- Bruno Daniel Durães Pereira Mendes
- Hugo Miguel Oliveira Romualdo Simões
- **+ 1 Teaching Assistant per Practical class (TP)**

Classes

- February 10 to May 30.
- Practical classes (TPs) start next week.
- The schedule is assigned by L.EIC. Any change needs to be authorised by them.
- Moodle is the main source of information. Please keep an eye out for messages, uploaded documents, and information.

Context

- I/O devices are an integral part of a computer

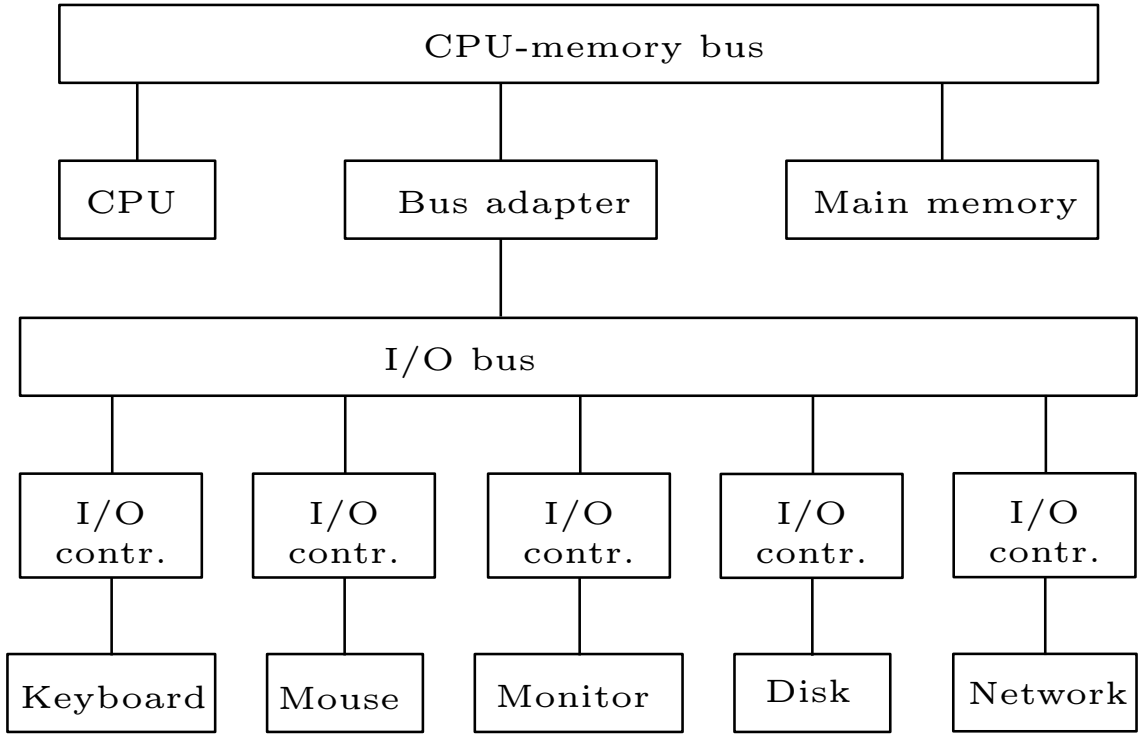


- The relevance of I/O devices has increased significantly with the deployment of an increasing number of embedded systems and the emergence of the Internet of Things
- However, programming of I/O devices requires specific knowledge and techniques

LCOM Objectives

This course aims to endow students with the knowledge and the skills required to:

1. ***Use the programmatic interface of the most common computer I/O devices;***

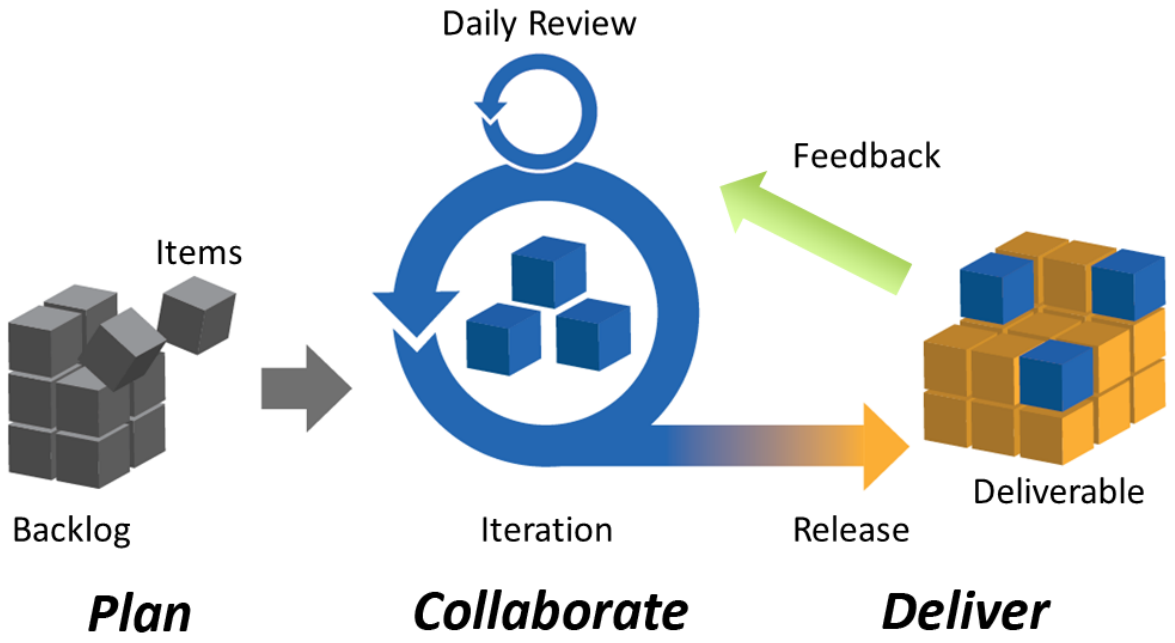


2. *Develop low-level/system-level and embedded programs*
3. *Use software tools typical of large programming projects*

How?

Three ways!

- **Lab assignments**: get in contact with the technology
- **Tests**: assess our learning and provide feedback of our progress
- **Project assignment**: build something with the technology as a team



Agile Project Management: Iteration

https://upload.wikimedia.org/wikipedia/commons/5/50/Agile_Project_Management_by_Planbox.png

High-level plan

Labs*

Lab	First Lab Class	Topic
Lab0	17 February	VBox and Minix (warm-up)
Lab2	24 February	Timer
Lab3	10 March	Keyboard
Lab4	24 March	Mouse
Lab5	7 April	Graphics Card
Project classes	28 April onwards	Team work

*Each lab has an introductory theoretical class the week before

Project

Assignment details: Week of 3-7 March
Submission: 30 May
Demonstration: Week of 2 June

Some tips

- **Take your time** with the materials and the exercises. There is a learning curve!

https://marianblogt.nl/wp-content/uploads/2019/01/thelearningcurve-1024x713.jpg

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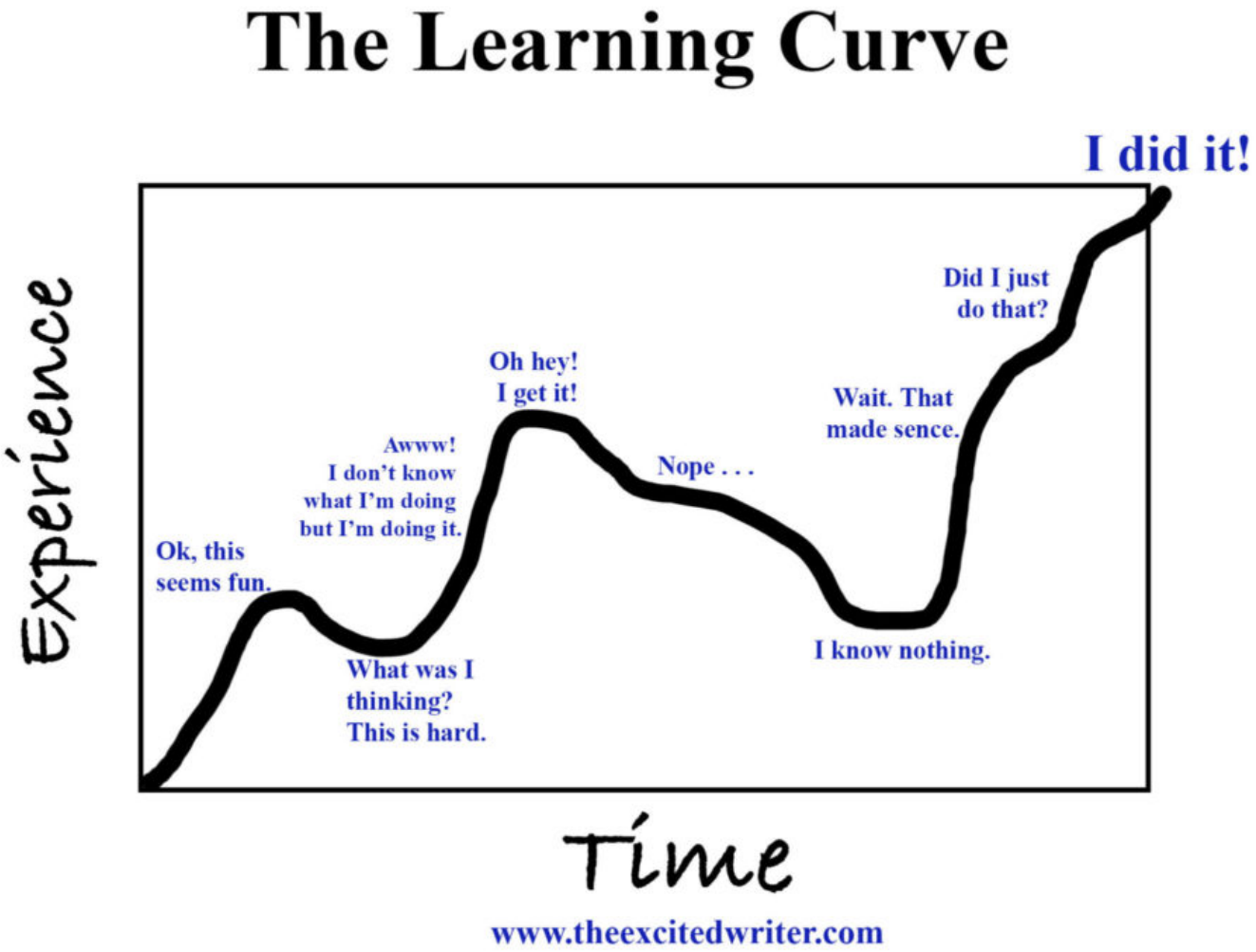

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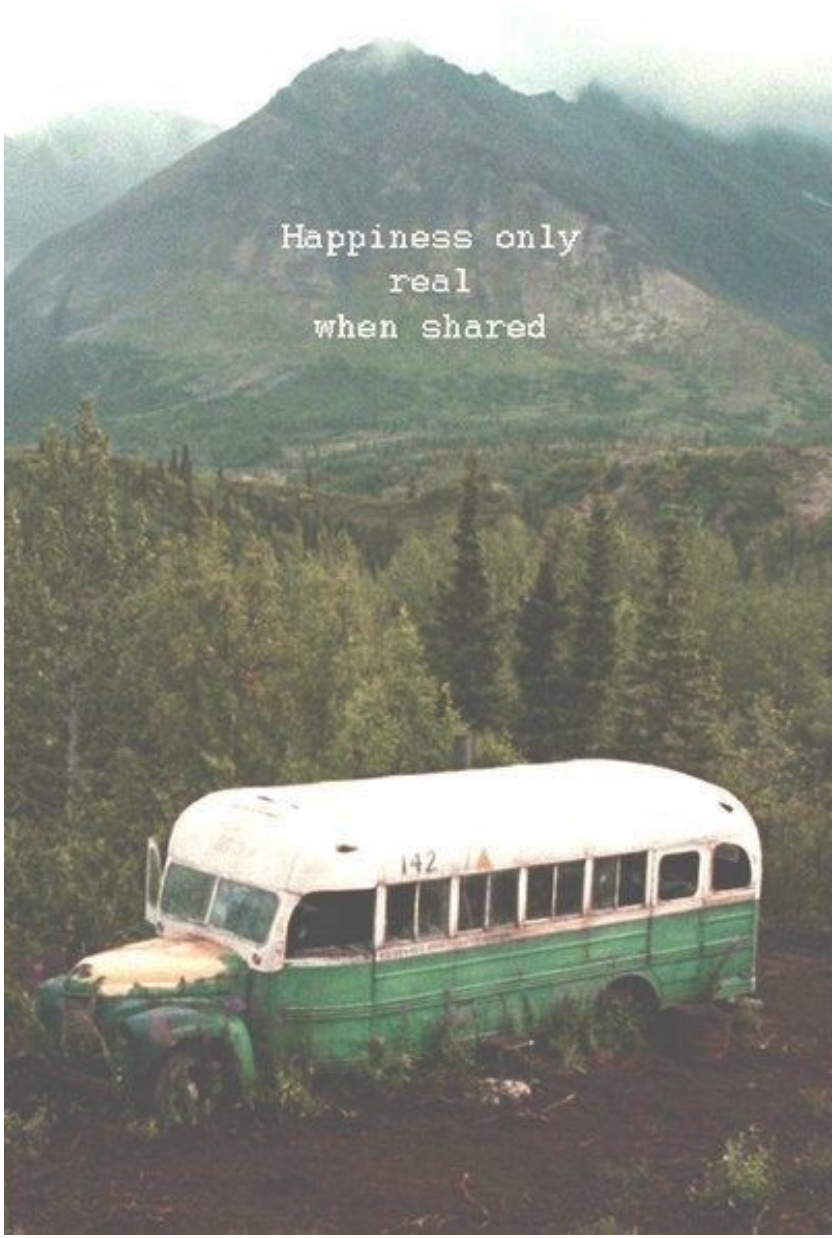
- **Invest in your team** and in learning how to use collaboration tools: git. Sharing the load will increase the chances of doing a great job in your project assignment.



Some tips

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- **Invest in your team** and in learning how to use collaboration tools: git. Sharing the load will increase the chances of doing a great job in your project assignment.

- **Choose the project theme wisely!** if possible, choose a theme/ topic/application about which your team is passionate about. Working on stuff we, ourselves, would love to have, will push us to do great things!

Grading

- 2 Tests + 1 Project.
- Projects are intended for groups of 4 students from the same TP class.
- Final grade = 0.4 * Average(Tests grades) + 0.6 * Project grade.
- More details in LCOM's webpage.

- Students that have successfully finished the project assignment in the year 2022/2023 and 2023/2024 can reuse that grade. If they wish to do this, they need to **fill in the form available in LCOM's Moodle page before 21 of February.** Students that reuse a past grade are exempt from attending the practical classes as well as from submitting a new project.

Intro to Minix, VirtualBox and I/O

[check additional materials]

Next week goals

The warm-up!

- **Choose your team** - all members need to belong to the same TP class
- **Get a GitLab repo for your team** from your TP professor
- **Setup VirtualBox+Minix** in your machines or run it in FEUP's computers.
- **Setup your working directory**. The folder where you will work on your lab assignments and project.
- **Sync your directories** and test how Git works with your teammates. [Reference for Git: https://git-scm.com/doc]
- **Run the warm-up C assignment** and discuss it with your team.

Acknowledgments

- Most of the materials were prepared by Prof Pedro Souto in an incremental manner. Prof Pedro Souto acknowledges the following contributions. For the year 2025, the team has tweaked just a few small things.
  - Prof. António Miguel Pimenta Monteiro (who designed the course)
  - Prof. João Cardoso (not the DEI's chair) (who perfected it)
  - Prof. Pedro Silva, who made possible major not so recent changes:
    - has proposed, designed and implemented the LCOM Framework;
    - implemented a set of utilities that make the development process in LCOM easier;
    - ported libx86emu to Minix, allowing us to use the most recent Minix version, and thus use more recent compiler with better error/warning messages and VirtualBox shared folders, which also simplify the development process in LCOM
    - developed a set of scripts to automatically generate a new VirtualBox image with Minix 3.4.0rc6
- Prof. Pedro Brandão (member of the 2021/2022 staff, who helped improve some documentation)