Sistemas Operativos: Apresentação
Operating Systems: Introduction

2º MIEIC

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Staff

Lectures

- ▶ Prof. Pedro Ferreira do Souto pfs@fe.up.pt

Labs

- ▶ Prof. Pedro Ferreira do Souto
- ▶ Prof. José Magalhães Cruz jmcruz@fe.up.pt

Objectives

Upon successful completion of this class you should be able to:

1. *Describe the role of an operating system (OS) and identify its main abstractions;*
2. *Enumerate the main components of an OS and how they can be assembled into an OS;*
3. *For each of these components, explain its functionality, the key issues in providing its functionality and the main algorithms used in its implementation*
4. *Develop programs that use the operating system API*
5. *Explain what are the main issues in concurrent programming and the mechanisms used to overcome these issues*
6. *Develop concurrent programs without race conditions*
7. *Develop device-drivers for the Linux OS*

Prerequisites

- *Programação 1 and Programação 2*
  - *In the lab classes you'll program a lot in C*
- *Computadores or Sistemas Baseados em Microprocessadores*
  - *The OS is the software layer that interacts directly with the HW*

Syllabus

Operating Systems

- Mechanisms and principles
- OS API
- Linux device drivers

Concurrent Programming

Method

Lecture classes

- ▶ Exposition of the key concepts and algorithms
- ▶ Hints for solving the lab exercises

Lab classes
Reinforce the concepts taught in the lectures
Small programming assignments

- ▶ With `gcc` in Linux

One project

- ▶ Development of a Linux device driver

Note The project should be done in groups of 2 students.

- ▶ Most of the development will occur after Queima

Academic Integrity

- UP, FEUP and we take academic integrity very seriously
  - Check out the Declaração de Princípios sobre a Integridade Académica na UP
- We will use special tools to detect copying of project code you submit
  - You are accountable for your partner, unless you clearly state which part of the code is yours.

Working Load

- SO has 6 ECTS, i.e. about 160 hours
    - Assuming 1 ECTS equal to 27 hours
    - Check out the European Credit Transfer and Accumulation System (ECTS)

Bibliography

- Book in Portuguese
    - **J.A. Marques, P. Ferreira, C. Ribeiro, L. Veiga, R. Rodrigues**, *Sistemas Operativos*, 2ª Ed., FCA
- Other OS textbooks, such as:
    - **Andrew S. Tanenbaum**, *Modern Operating Systems, 3rd Ed.*, Prentice-Hal
    - **A. Silberschatz, P. Galvin and G. Gagne**, *Operating System Concepts*, 7th Ed.

    both available in the library.
    - Earlier editions of these books, or of similar books, are better than no book at all

On-line Resources

- Online books,
    - **Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau**
      Operating Systems: Three Easy Pieces
    - **J. Corbet, A. Rubini and G. Kroah-Hartman**,
      Linux Device Drivers, 3rd Ed., O'Reilly
- Course web page: http://web.fe.up.pt/ pfs/aulas/so2013/
- Course page on Moodle
  https://moodle.fe.up.pt/1213/course/view.php?id=47
    - We'll use the forum facility
        - No code sharing, except if requested by staff
        - You can still help each other, by suggesting ideas or algorithms

Grading

1. Final exam (F)
2. Programming test (PP) (scheduled to after Easter)
3. The project (Pr) must be demonstrated in the last class of the semester.
4. Class participation, including forum on Moodle (PA)

Formula 0.5 F+ 0.2PP + 0.2 Pr + 0.10 PA

Thank You!
Questions?

Announcements

Classes

- Start 10 minutes after the hour, i.e. 15:40.
- We'll make a 5 minutes break around 16:30.

Labs

- Start next week, i.e. February 18th

Important Dates

What	Date
Programming Test	April, 24th
Project	May, 26th

- Project demo in the first lab class after due date.
- Dates subject to change, as determined by the Program Director