HÁSKÓLI ÍSLANDS
Iðnaðarverkfræði-, vélaverkfræði- og tölvunarfræðideild

TÖL401G: Stýrikerfi / Operating Systems · Vormisseri 2022
Assignments 1–2 · To be solved until 25.1.2022, 13:00

For conditions of homework, see slides in file "`tol401g_00preface`" available on the Canvas course page. Short version:

- Each assignment gets a grade: the best 12 grades count and each contributes 2.5% to the final grade. Not submitting counts as 0.0.
- You are allowed and encouraged to submit as a pair of two. If you look for another student to team up: ask in Canvas.
- Submission is electronically (.pdf format) only via `https://www.gradescope.com`
  You will be informed once submission is possible.
- **Register for one of the assignment solution discussion groups (dæmatími) via Gradescope/Fólk/dæmatími**. If you are not registered, you cannot submit solutions to Gradescope!
- **You must have turned in at least 4 assignments by 15. February 2022 to continue this course and to be admitted to the final exam.**

Examples from each chapter will be explained in videos that are available in Canvas via "Panopto". On Thursday lecture you will have opportunity to work on assignment with assistant from teachers. Report via Canvas/(another tool later) at any questions that you have, so that we can clarify this during class.

Assignment 1

Discuss whether operating systems are needed at all![1] Consider for example the situation where only one single fixed application program is executed on a hardware with no user interface (like in an embedded system such as the software running on the electronic control unit hardware of a car, e.g. for motor control). Is an OS needed in this case or could the single fixed application program run on the hardware without an operating systems?

In case you come to the conclusion that operating systems are not necessarily needed: why is it nevertheless reasonable to have an operating system in-between an application program and the hardware?

Assignment 2

Explain the POSIX standard that can be found at
`http://pubs.opengroup.org/onlinepubs/9699919799/`
by covering *briefly*:

[1] Note: This is quite a philosophical question – as such probably any answer is correct as long as you justify your answer reasonably!

1. (a) which standardisation bodies (more than one involved!) standardised POSIX,
   (b) what is the name and/or number (e.g. "ISO 9000-2017" would the name/number and year) of and year of the latest standard,
   (c) and what POSIX is about in general,
2. what each of the volumes
   (a) "Base Definitions",
   (b) "System Interfaces",
   (c) "Shell & Utilities"

   is about (you can omit the volume "Rationale"; for the other volumes, 1 or 2 sentences per volume are sufficient: just have a brief look into the different "volumes" listed at the above URL to get an idea about each volume).
3. Do some research on your own (and name the source you used) to give
   (a) the name of one example operating systems that is certified to be fully POSIX compliant,
   (b) the name of one example operating systems that is mostly POSIX compliant.