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Exercise for lecture Real-Time Operating Systems Design and Implementation
Winter semester 2019/2020

Exercise Sheet 1

(10 Points)

Thursday, October 24, 2019

Please use the provided user name and password for login to the machine and for your svn account. You should be able to find the materials in this folder: https://ls12-svn.cs.tu-dortmund.de/svn/course_rtos19/. You can find some useful information in the file *info_RTOS* on the main directory. We don't limit the Integrated Development Environment (IDE) you use to edit the source code. Only using "terminal" is also possible.

1.1 Version Control with Subversion (svn) (2 points)

- What are *version control system* and *subversion*?
- What is the meaning of the following terms: *repository, working copy, trunk, tags* and *branch*?
- Please use the provided svn directory of your group to practice mainly the following svn commands and submit your answers for each exercise: *add, checkout, commit, copy, delete, diff, export, import, info, list, log, revert, status* and *update*.
- Please create your own folder: https://ls12-svn.cs.tu-dortmund.de/svn/course_rtos19/Groups/rtos1900x/ where x is your group number.

1.2 Raspberry Pi and Pibrella (2 points)

- Raspberry Pi
  - Which model of the Raspberry Pi do you have?
  - Which processor and peripherals does it have?
- Pibrella
  - What is the Piberella board used for?
  - Please find the mapping between the GPIO pins and the Pibrella peripherals.

1.3 FreeRTOS (6 points)

Please familiarize yourself with the files in the *FreeRTOS_RaspPi* and *bootloader* directories in the *Shared* folder for the following tasks:

- What are the 3 core files of the FreeRTOS?
- Where are the files specified for the processor architecture located?
- What does the *bootloader* do? Which file is loaded first and which one contains the configuration parameters?

- Please follow the steps below to install FreeRTOS:
  a. Copy all the files in the *bootloader* directory to the SD card after formating it.
  b. Run the *make* command in the *FreeRTOS_RaspPi* directory to generate the kernel.
  c. Copy the *kernel.img* file to the SD card.
  d. Place the SD card into its slot on the Raspberry Pi and connect the micro USB power supply to the Pibrella in order to turn the Raspberry Pi on.
- Write a code to use all the LEDs, the buzzer and the button on the Piberella board.