

FACULTY OF ELECTRICAL ENGINEERING AND
COMPUTING
DEPARTMENT OF CONTROL AND COMPUTER ENGINEERING

Computer Architecture 1R

3rd Laboratory Exercise

January 2025

1 Task

In the computer system, there is a FRISC-V processor along with the **GPIO 1** module at address **0xFFFF 0F00** and the GPIO 2 module at address **0xFFFF 0B00**, as shown in the lectures. On **port A** of the **GPIO 2** module, a switch and a button are connected as follows:

- bit 0 - button
- bit 1 - switch

An LCD display is connected to **port B** of the **GPIO 1** module in the configuration shown during the lectures. For this system, it is necessary to write a program that **counts button presses while the switch is closed**. When the switch is open, button presses are **ignored**. The counter value must be displayed on the LCD every time it changes. When the switch is opened, the display does not change because the counter value remains the same. At the start of the program, it is not necessary to display the value 0. The maximum counter value is **twelve**, after which the counting restarts with the next button press, meaning the next displayed value will be 1.

Digit extraction for displaying numbers on the LCD should be implemented using the subroutine **process**. The subroutine receives the counter value via register **x17** and returns the ASCII-codes of the digits for display via registers **x10** (tens) and **x11** (units). For displaying numbers on the LCD, you may use the example from the lectures, but be mindful of the registers being used.

Note: Numbers with a single digit should be displayed as such on the LCD. For example, the number 1 should appear as "1" and not "01".

2 Submission

Submit your **own** solutions by sending it by e-mail either in their original format named **lab3.a** or in a .zip archive at the e-mail address **matko.batos@fer.hr** by **Thursday, January 23rd 2025 at 23:59**.

For any questions, we are available via email.