



Task 4: Simple projects for Raspberry Pi Pico with Arduino IDE

Implement two given projects on real-life hardware

Individual variant: two given projects chosen based on the number of student and his/her name

Subtasks:

- 1) Implement Project I composing and running ES hardware-software complex.
- 2) Implement Project II composing and running ES hardware-software complex.

Optional study: how to debug projects on simulated hardware

Directions:

- For each project provide the following info:
 - Verbal description
 - Component list
 - Electric circuit layout
 - Hardware connection
 - Arduino sketch
 - Screen images of compilation and uploading process
 - Scheme explaining ES work
 - Photo of connected hardware
 - Video of ES functioning with the author's interview

Questions to muse: How to improve reaction of ES on real-life events – minimize time of response

References:

- Lecture 1 – Basic concepts of Embedded Systems
- Lecture 5 – Practical ES design with Raspberry Pi Pico in Arduino IDE
- Lecture 6 – Overview of modern microcontrollers

Supplemental materials: Freenove Tutorial for RP Pico with Arduino IDE

Task variants:

Project I. Tiny complete ES with button (sensor) and LED (actuator)

Hardware: from Tutorial Chapter 2.

Switch cyclically modes by the button click: idle (LED off); light (LED on); repeat transmitting your name (4 first letters) by Morse Code. Provide fast switching with reaction time not exceeding 0.01 s.

Project II. Implement a given Tutorial Chapter project according to the following table:

Stud. no.	1	2	3	4	5	6	7	8	9	10
Chapter no.	3	4.1	4.2	5.1	5.2	6.1	6.2	8.1	8.2	14.1

