
Milestone 02 Description

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Milestone 02 Description

Milestone 02 Overview

The main aim of this milestone is to build the core of the project hardware. All hardware components must be bought and installed on your project body as stated in your proposal. Consequently, all pre-chosen sensors/actuators shall be wired to your microcontroller/s and installed on the project/Mechanism body. The structural design of the project along with the hardware connection must be relevant to your project functionality as well as a State flow Model of all your sub systems shall be designed.

Deliverables

This milestone is divided into Hardware tasks and modeling tasks as shown below:

1. Hardware Task

- In this milestone, you are requested to purchase all the hardware components required and stated in your proposal (Sensors, Actuators, LCDs, LEDs, Motors, Servo motors, motor-drivers, pushbuttons, buzzers, car-chassis etc.)
- All sensors/actuators/ICs needed must be wired to your microcontroller according to their datasheet.
- You can either buy the project's core-body if available or design and manufacture it based on your project requirements.
- The hardware components must be fixed on the designed body/Mechanism.
- Implement the Structural design such that it is relevant to your project functionality.
- **Write a dummy Embedded-C code to read the data from each of your sensors and verify each sensor measurements using at least one of the two ways shown:**
 1. **Verify** the sensor measurements by controlling the actuators, Digital sensors can be synchronized with corresponding LEDs that turn **on** when the sensor is on and **Off** when the sensor is off. However, with the Analogue sensors an embedded C logic could be implemented to vary the LED brightness based on variable sensor Input.
 2. Connect an **LCD-display** to your microcontroller and implement an embedded C code to interface with the LCD and thus displaying the Sensory data as LCD messages.
- **Write a functional Embedded-C code to dummy-control and vary the performance each of your actuators to verify their full functionality.**

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Note: Feel free to Include/use any additional libraries to access the LCD display or any of the components. The code can include embedded **C / C++ / Micro-Python**.

2. Modeling Task

- You are requested to provide a handwritten state flow model of your system and indicating the use of the following concepts in your state chart:
 - **Concurrency**
 - **Orthogonality**
 - **Broadcasting**
 - **Hierarchy**

Evaluation

Submission only ☺

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Submission Guidelines

- The deadline for submission is **Thursday 23th of November, 2023 at 11:59 PM**
- You are requested to submit the following documents:
 1. A 2-minute video showing the project body/mechanism and all the connected hardware components. Sensors and actuator should be activated during the video to guarantee the full grade.
name the Video (MS_02_Team_m_Video.mp4)
 2. All developed project files (workspace folder) containing all the .c and .uf2 files and any extra libraries/directives needed to run the developed code of all sensors/actuators.
name the Code (MS_02_Team_m_Code.zip)
Note: file names should be self-explanatory of the content for example Ultrasonic_sensor.C , servomotor.c, etc....
 3. The required project description report
name the report (MS_02_Team_m_Report.pdf)
Note: the report should include a scanned pdf document of the labelled State flow model and any explanatory notes of your system.
- Please upload your milestone documents to your drive as a .zip file with the following naming format:

[\(Ex.: CSEN701_W23_MS_02_Team_m.zip\)](#)

where **m** is your team number
- Submit **ONLY** the sharing link through the below form and **Make sure that you give permission to access**

https://docs.google.com/forms/d/e/1FAIpQLSdWS9N4qJN-_iQK9bCbaa0CZQwuA5n2UlvYuSNleH0str9eVQ/viewform?usp=sf_link

Good Luck 😊