ENGINAATOR 2024 FINAL TASK DESCRIPTION

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1. INTRODUCTION

The Final Task of Enginaator 2024 for the IT-Electronics category will be to further develop the solution you created in the Stamina task. You will be able to create something of your own design and this will be evaluated to determine the winning team of Enginaator 2024.

2. TASK DESCRIPTION

The Final Task is to create a video game console of your own design, using the materials that have been provided to you. You must improve or rebuild the existing hardware that you built in the Stamina task. Additionally, you must either modify or rewrite the software, so that it will conform to your own design.

Note that this is a very open-ended task and the exact design of your own game will be left up to you. The main purpose is to create a solution that is reliable, aesthetically pleasing and will impress the final jury.

If some components have been destroyed during the Stamina task, please talk to the SRE representatives and we will likely be able to provide a replacement.

2.1. Requirements on the game

There are few requirements on the game itself. One is that it must **not** be a game of “Snake” as you developed in the Stamina task. For this task you must create something new and unique.

Note that it is likely possible to find ready made solutions online that use the ESP32 microcontroller to drive something like an existing console (e.g. a Nintendo 64 emulator). The source code used for this task must be your own creation and no points will be awarded for using an existing solution.

2.2. Mandatory Elements

You will be provided with an SD card containing some graphical elements. Most of these come in the form of sprite sheets. **You must use at least 2 of these graphical elements in your game.** Note that we have provided some extensive sprite sheets to you, but in you do not need to use the whole sprite sheet, simply a recognizable part of it.

3. SHOPPING SYSTEM

For the final task you are provided with a small **extra budget of 100€**. You can compile a list of desired materials, and these will be provided to you by the BEST-Estonia organizer team. Please refer to their exact instructions on how to use the shopping system and order materials through it.

4. EVALUATION CRITERIA

NOTE that for the evaluation of the Final Task, **no points are carried over from previous tasks**. You will have 10 minutes to present your solution to the jury.

Each of the solutions shall be awarded points based on the following criteria:

Category	**Maximum Points**
Game Reliability	20
Graphics	20
Sound	10
User Interface	10
Level of innovation	30

Note that these categories are deliberately defined in an open manner. We aim to give a free hand to the teams in the final task. This system of points should encourage the teams to create different and innovative game systems. We wish to reward out-of-the-box thinking, complex feats of engineering and inventive gameplay.

In order to score points in the “Level of Innovation” category we recommend exploring the full range of capabilities of the ESP32 microcontroller and the ILI9341 display. The display has a touch screen which could be used for a variety of solutions.

We have provided you with gyroscope sensors that could be used to measure the tilt and movement of the game console itself.

If so desired, it is possible to provide you another ILI9341 display which could lead to a 2-display multiplayer solution (Although this would certainly push the ESP32-s SPI interface to its limits).

Innovation does not need to be limited to complex technical solutions however. If the game itself is innovative in terms of gameplay and functions well, then this can be a good way to score “Innovation” points.

4.1. Process of Evaluation

You will present your solution to the jury and each team will have 10 minutes to demonstrate it. **You must also present your source code to the jury for review before the demonstration begins!**

After the demonstration of all Final Teams is complete you will have the opportunity to view the presentations of engineering tasks in other categories as well.

After all demonstrations are complete, the jury will convene and make a final decision on who shall win the competition.