

MAESTRO MAKER - TUNE INTO INNOVATION!

Attention all innovators, creators, and visionaries – simply HACKERS! 🎉

Get ready to embark on an exhilarating journey with our company, the trailblazer in the world of home appliances! We're not just about making your lives easier; we're here to revolutionize your daily experiences and bring a whole new level of awesomeness to your homes! 🏠💡

Imagine this: a world where your appliances don't just work for you, but also serenade you with delightful tunes and melodies! 🎵 Picture your refrigerator crooning a soft melody as it reminds you to stock up on your favorite treats, or your dishwasher playing an upbeat jam to make tackling that post-party mess a total blast! 🧼🎉



But wait, there's more! We're not just here to entertain you; we're also on a mission to make our products more accessible and inclusive. With clever sound cues and voice prompts, we're making sure that everyone, including those with visual impairments, can enjoy the full functionality of our appliances. 🧑🗣️❤️

And let's not forget about the **power of personalization!** Imagine being able to choose your own soundtrack for your daily chores, creating a one-of-a-kind experience that's tailored just for you. 🎧🌟

That's where you come in, **you brilliant minds!** 🧠💡 We're calling on you to join us in the "**Maestro Maker: Tune into Innovation**" challenge, where you'll have the chance to let your creativity run wild and help us push the boundaries of what's possible in the world of home appliances. 🎹👉

We believe that by **adding a sprinkle of sound and a dash of voice** to our products, we can transform everyday tasks into moments of **pure joy** and create experiences that will have our customers singing our praises! 🎤👏

So, **are you ready** to join us on this thrilling adventure? Get ready to flex your innovation muscles and help us create products that don't just work, but also strike a chord with our customers! 🎸👉

Let's dive into the exciting objectives of the Maestro Maker - Tune into Innovation challenge together! 🎵🎹👉
Get ready to **rock the world** of home appliances like never before! 🌍🚀



CHALLENGE TASKS WITH EVALUATION CRITERIA

TASK 1: EMBEDDED MUSIC PLAYER SOFTWARE CREATION

OBJECTIVE

Develop an embedded music player for the NUCLEO-G0B1RE microcontroller with an Arduino UNO multifunction shield that can play single notes, musical scales, and complex melodies. Include interactive hardware control features.

DELIVERABLES

- **Embedded software for music playback on the specified hardware.**

SUBTASKS

- **1.1 Play a Single or Mono Note (25 points)**
- **1.2 Play a Musical Scale (15 points)**
- **1.3 Play a Complex Record (25 points)**
- **1.4 Interactive Hardware Controls (35 points)**

EVALUATION CRITERIA

- **Single Note Playback (25 points)**
15 points - Ability to play any note
10 additional points - Accurate playback of any specific note (such as a' or A₄ at 440.00Hz) verifiable by a tuning application (e.g., in mobile phone)
- **Scale Playback (15 points)**
Playback of a complete (any of known) musical scale sequence (e.g., do-re-mi-fa-sol-la-si-do) - again verifiable by tuning application.
- **Complex Melody Playback (25 points)**
Software must play a complex melody such as the Mario Bros theme or any other you prefer.
- **Hardware Interactivity (35 points)**
Effective use of hardware buttons and display for user interaction, with playback options corresponding to previously mentioned tasks.



TASK 2: DESIGNING THE MELODY DATA STRUCTURE (MDS)

OBJECTIVE

Design and implement the Melody Data Structure – a data structure that can store sound records with attributes such as pitch, duration, bpm, intensity, timbre or similar. Consider it like bridge between embedded music player and MyComposer application described in next task.

DELIVERABLES

- **A Melody Data Structure (MDS) specification.**
- **Implementation code exemplifying the use of the MDS.**

EVALUATION CRITERIA

- **Design Completeness (20 points):**
The MDS must be well-structured to represent all necessary melody attributes effectively.
- **Implementation Functionality (30 points)**
The MDS should be functional and demonstrate the ability to store and retrieve musical data with precision



TASK 3: "MYCOMPOSER" APPLICATION DEVELOPMENT

OBJECTIVE

Create the "MyComposer" application that utilizes the MDS from Task 2 to enable users to compose and store musical records, convert music into the MDS format, and implement a text-to-music feature. Participants can draw inspiration from virtual piano interfaces or tools like the Nokia 3310 composer. Melody should be playable on embedded music player.

DELIVERABLES

- **A functional "MyComposer" application for either PC or mobile platforms.**

SUBTASKS

- **3.1 Music Composition Tool Development (40 points)**
- **3.2 Music Conversion Feature Implementation (30 points)**
- **3.3 Text-to-Voice Feature Development (30 points)**

EVALUATION CRITERIA

- **Composition Tool Effectiveness (40 points)**
The application must feature an intuitive tool for music composition.
- **Conversion Capability (30 points)**
The application must be able to convert existing music into the MDS format with reasonable accuracy.
- **Text-to-Voice Feature (30 points)**
The application must include a text-to-voice feature, with bonus points for male and female voice differentiation.



Note: Points for each subtask within the main tasks will be awarded based on the functionality, accuracy, and innovation demonstrated in the final product. The maximum score for the first and third task is 100 points, for the second task you can get 50 points. The total maximum score being 250 points for all tasks combined. The winners will be determined based on the highest cumulative score.