1] Arduino-UNO Obstacle Detection & Mitigation System →

In Class 8, I built an Arduino-UNO-based car with an obstacle detection and mitigation system. It had an ultrasonic sensor for detecting obstacles and a servo motor (known for its precise rotational control) to scan the surroundings. The car's four motors were controlled by a motor driver, which was connected to the Arduino. At the time, I wasn't proficient in programming, so I relied on C++ code that was publicly available on YouTube. However, after careful analysis, I identified how different parameters affected the car's delay, speed, and stopping distance. This taught me a lot about the logic behind the code and how it was working so flawlessly.

2] Bluetooth-Controlled Car →

For my next Arduino project, I built a Bluetooth-controlled car. I replaced the ultrasonic sensor and servo motor with a Bluetooth module, allowing it to connect to any mobile device through an app called Bluetooth RC Controller. The rest of the setup remained unchanged, and it functioned smoothly.

3] Automatic Hand-Sanitizer Dispenser →

During the COVID-19 pandemic, I repurposed the obstacle-detection car setup by replacing the four motors with a 12V DC pump. Whenever the ultrasonic sensor detected a hand (or any object) within 10 cm, the pump dispensed sanitizer. It functioned like a touchless hand-wash dispenser.

4] Learning Python →

In Class 9, I started learning Python through YouTube. I covered:
- a) Data types: String, Integer, Float, Boolean
- b) Data structures: list, set, tuple, dictionary
- c) File handling: reading, writing, updating
- d) Core programming concepts: operators, functions, conditional statements, loops, recursion, exception handling, and scope of variables & functions

Unfortunately, I couldn't continue due to academic commitments, but this helped me with my other upcoming programming ventures.

5] Game Development with Unity →

When I revisited programming later, web development and game development were trending. I explored Unity and attempted to build a first-person shooter (FPS) game using the PlayMaker extension (a no-code tool). Though I successfully integrated key remapping, visual effects, and a scoped aiming system, I realized that game development requires a structured, interdisciplinary approach. Unlike web development, where I could execute ideas independently, game development was more demanding in terms of planning and execution.

6] Web Development (My Favorite Field) →

From Class 10 onwards, I have been working with HTML, CSS, and JavaScript, occasionally refining my skills. Even with AI-generated websites becoming more common, I prefer crafting websites from the ground up. This ensures I have full control over the design and functionality of the website.
Some of my web projects include:

a) A Windows 11 UI clone (based on an early concept video by Microsoft before it was released)
b) A website based on my friend's wireframe design for an aesthetically pleasing operating system
c) My portfolio website (still in progress), inspired by Instagram's color theme. It includes:

[α] A cart system that tracks selections and sends me an email with the customer's details
[β] Smooth animations and space-saving design elements
[γ] A modern, visually appealing interface that has received positive feedback

I regret not diving deeper into backend development and frontend libraries yet, but I plan to do so soon. Once I do, I assure you that my websites will have a distinct character and uniqueness.

7] Mac Widget Development using Übersicht →

While searching for a good task-tracking widget for my Mac mini, I found none that met my needs. This led me to Übersicht, an app that allows widget creation using CoffeeScript (which embeds HTML, CSS, and JavaScript). I built a to-do list widget that:

a) Holds up to 25 tasks
b) Supports direct desktop updates for adding/removing tasks without having to open a separate editor window
c) Runs three instances, tracking my progress in Mathematics, Physics, and Chemistry respectively

I also modified a Spotify ad-muting widget from Übersicht's widget gallery by tweaking both its functionality and appearance.