Task 4.1D

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We finally chose a toy car that was highly scalable and easy to produce. Among the accessories used are

IDUINO UNO R3. L298N motor driver board. Arduino sensor expansion board. Ultrasonic module .SG90 servo. Car Chassis. Car wheels. DC gear motor (1:48). Jumper cable. Metal bracket for motor. Universal wheel. Several screws and nuts. Servo bracket

This robot is based on the Arduino Uno development board and uses a 2-wheel drive platform with ultrasonic sensors for obstacle functionality. And the project is scalable, you can replace, upgrade and expand the input sensors and add other functions by adding other modules. Add remote control functionality by adding Bluetooth or Wi-Fi modules.

A microcontroller board is called Arduino. The CPU, RAM, and ROM are all located in the microcontroller on the Arduino board. The Arduino board's extra hardware is only utilised for power, programming, and communication.	The Raspberry Pi is a small computer with a CPU (SBC). The Raspberry Pi runs at a speed of about 1.2 GHz. may quickly connect to the Internet through Ethernet or Wi-Fi.	Esp32 options begin with 4 MB of flash memory. There may be an option for 8 MB or 16 MB in some modules across the various series.
The Arduino is appropriate for sensor connection, LED control, and motor control.	The Raspberry Pi SBC contains a CPU, memory, storage, graphics drivers, and ports on the board, giving it all the functionality of a computer.	The Esp32 has between 38 and 77 I/O pins, depending on the module
There are 256 kB of flash memory on the Arduino Zero. For Arduino Uno to connect to the internet, extra modules or shields are needed.	Operating systems are necessary for Raspberry Pi to function. The generated source code binaries are all that are required.	There is no need for an add-on because the Esp32 has built-in Wi-Fi capabilities..
There are 20 digital	The Arduino is appropriate for	**To mention a few**

I/O pins on the Arduino Zero, including 1 analogue output pin and 6 analogue input pins. All pins (apart from pin 4) can be utilised to use an external interrupt to start a function.	attaching sensors and controlling LEDs and motors, whereas the Raspberry Pi is appropriate for creating software programmes using Python.	physical characteristics, the ESP32 incorporates 10 internal capacitive touch sensors, an integrated temperature sensor, and an integrated Hall sensor.

Arduino UNO R3, with a low barrier to entry, a large number of open-source database sketches and shields, low cost, and no need for third-party programmers or external power supplies. Disadvantages include the inability to run multiple programs simultaneously, limited number of IDEs, and no memory safety checks.

With Arduino Shields, the advantages are that they add more functionality to projects using Arduino, connecting them is very simple, just plug and unplug from the Arduino motherboard, and there are no complicated circuit connections. Simplifies all the complex hardware into a simple interface. This allows you to get up and running with your ideas quickly. The downside is that Sketches and shields can be difficult to modify.

The advantage of the L298N motor driver board is that the connection between the motor and the circuit becomes simple and only the appropriate pins need to be inserted. However, it also has the obvious disadvantage that it relies specifically on the Arduino UNO R3, so the average beginner will encounter more obstacles when trying to follow the provided circuit diagram.

Overall, Arduino is undoubtedly the best and simplest for beginners who want to build their own projects using Arduino for the first time, because it is open source, low cost, scalable, etc. For power consumption, the power consumption of Arduino Uno has been reduced by 88% from 98mA to 11mA and the voltage is a stable 5V. In terms of CPU, size and cost, it is sufficient for the first project. The current cost for building a three-wheeled robot car is about $55 AUD.

Arduino Platforms	Raspberry Pi	Esp32