**VIDEO 04 : Programming an Attiny+Homemade Arduino Shield**

This video demonstrates how to connect a Bluetooth module to an Arduino Nano to control LEDs using an Android app. The creator explains how to wire the module, overcome voltage differences, and program the Arduino. They also provide a free Android app recommendation and share their code for controlling the LEDs.

**VIDEO 05 : MULTIPLEXING**

The video demonstrates **multiplexing**, a technique to control many LEDs (like in an LED matrix or cube) with few microcontroller pins. It works by rapidly lighting up rows of LEDs one after another, so fast that the human eye perceives a complete, static image. The project uses an Arduino Nano, a TLC5940 LED driver, and MOSFETs to achieve this.

**VIDEO 06 : how to build a standalone Arduino circuit using an ATmega328p microcontroller.**

This video demonstrates how to build a standalone Arduino circuit using an ATmega328p microcontroller. The video covers the necessary components, wiring, and programming methods, including using an FTDI chip for USB to serial conversion. The video also discusses the advantages and disadvantages of using a standalone circuit compared to a traditional Arduino board.

**VIDEO 07 : The use of 7-segment displays, both with and without an Arduino microcontroller**.

This video explores the use of 7-segment displays, both with and without an Arduino microcontroller. It covers different types of displays, how to use a BCD to 7-segment display driver, and how to multiplex multiple displays using an IC specifically designed for this purpose. The video also includes a demonstration of how to use a library to control the displays with an Arduino.

**VIDEO 08 :** **how to use LEDs and current limiting resistors**

This video explains how to use LEDs and current limiting resistors. It covers basic concepts like forward voltage and current, and how to calculate resistor values. The video also explores more advanced topics like variations in LED forward voltage and how to use constant current sources to drive LEDs.

**VIDEO 09 : diodes in electronics**

This video explores the importance of diodes in electronics, focusing on their use in DC circuits and AC-to-DC conversion. The video explains how diodes prevent damage from reversed polarity and how they can be used to create a simple DC power supply. It also introduces the concept of bridge rectifiers, which allow for more efficient DC conversion.

**VIDEO 10 :** **Digital to Analog Converter (DAC)**

The video explains what a Digital to Analog Converter (DAC) is and how it works. In short, a DAC converts digital signals into analog signals. The video demonstrates an R-2R resistor ladder method as a basic DAC. The video also explores generating different analog waveforms and explores dedicated DAC integrated circuits (ICs) for more precise solutions. DACs have various applications, including generating audio and video frequencies and creating audio filters.