KY-031 Knock Sensor Module – Detailed Explanation

1. What is KY-031?

The **KY-031 Knock Sensor Module** is a vibration-sensitive switch designed to detect **physical knocks, taps, or vibrations**. It is widely used in interactive projects where an external force (like tapping on a surface) triggers an action.

It consists of:

- **A spring-like vibration sensor**: This is a conductive spring that momentarily closes a circuit when struck.
- **A pull-up resistor**: This keeps the output stable when no knock is detected.
- **Three pins**: VCC (Power), GND (Ground), and OUT (Signal Output).

2. How Does KY-031 Work?

- The sensor has an internal **spring mechanism** that **moves upon impact**, momentarily closing the circuit and generating a **LOW (0V)** signal.
- When the sensor is at rest, the circuit remains **open**, and the signal output is **HIGH (5V)**.
- The Arduino reads this **change from HIGH to LOW** as a knock event.

3. Applications of KY-031

KY-031 can be used in many real-world applications, such as:

- **Knock-Activated Door Locks** – Unlocking a door with a specific knocking pattern.
- **Security Systems** – Detecting unauthorized tampering or vibrations.
- **Music and Rhythm Games** – Triggering sound effects or events by tapping.
- **Wake-Up Sensors** – Activating a device when a knock is detected.

4. KY-031 vs. KY-002 vs. KY-025 – What's the Difference?

Module	Function
KY-031	Knock sensor – detects vibration/taps
KY-002	Shock sensor – detects strong impacts
KY-025	Reed switch – detects a magnetic field

5. Summary

- **KY-031 is a vibration sensor** that detects knocks and taps.
- It outputs **LOW** when a knock is detected and **HIGH** when idle.
- Can be used for **interactive systems, security, and smart devices**.
- Simple interface with **Arduino (VCC, GND, OUT)**.
- **Useful for knock-based control systems**, such as secret knock locks.

KY-031 Knock Sensor Module