**SHRAVANI A BU22EECE0100447**

**HANDS ON ACTIVITY EMBEDDED SYSYTEM**

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| **Feature** | **8051 Micro-controller** | **Arduino** |
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| **Architecture** | **Harvard** | **Modified Harvard** |
| **Instruction Set** | **8-bit** | **8-bit (AVR) or 32-bit (ARM)** |
| **Clock Speed** | **Typically up to 12 MHz** | **8 MHz (Uno), 16 MHz (Mega), varies with different boards** |
| **Memory** | **ROM, RAM, EEPROM** | **Flash, SRAM, EEPROM** |
| **GPIO Pins** | **Limited** | **Abundant, typically 20 or more** |
| **Analog Inputs** | **Usually limited** | **Typically multiple, 6 or more** |
| **Digital I/O** | **Limited** | **Abundant** |
| **Development Tools** | **Limited availability** | **Extensive community support, IDE like**  **Arduino IDE** |
| **Programming** | **Assembly, C** | **Arduino Sketch (C/C++)** |
| **IDE Support** | **Limited** | **Arduino IDE, PlatformIO** |
| **Debugging** | **Limited** | **Limited (Serial debugging, LED blinking)** |
| **Cost** | **Affordable** | **Affordable** |

**To summarize:**

The 8051 micro-controller is a classic 8-bit micro-controller known for its simplicity and robustness. It's widely used in embedded systems, particularly in industrial applications.

Arduino, on the other hand, is a popular open-source hardware and software platform that simplifies the process of creating electronics projects. It typically uses AVR or ARM-based micro-controllers and offers a user-friendly environment for programming and prototyping.