EE410_Projet

The Arduino Uno R3 has specific voltage and frequency limitations for its various types of ports. Here's a list of voltage and frequency specifications for each type of port:

Digital I/O Ports (D0 to D13):

- **Voltage**: 0V (LOW) to 5V (HIGH)
- **Frequency**: Digital I/O ports can be used to toggle pins on and off rapidly, and they can handle frequencies in the range of a few Hz to hundreds of kHz. The specific switching speed depends on the load connected to the pin and the microcontroller's capabilities.

Analog Input Ports (A0 to A5):

- **Voltage**: 0V to 5V
- **Frequency**: Analog input ports are not designed for frequency measurement. They are used for reading analog voltages from sensors, and the frequency of the input signal is not a relevant specification for these ports.

Power Ports (5V, 3.3V, GND):

- **5V Pin**:
  - **Voltage**: 5V
  - **Frequency**: The 5V power pin itself is not used for signal frequencies; it provides a stable 5V voltage supply.
- **3.3V Pin**:
  - **Voltage**: 3.3V
  - **Frequency**: The 3.3V power pin itself is not used for signal frequencies; it provides a stable 3.3V voltage supply.
- **GND Pins (Multiple)**:
  - **Voltage**: 0V (Ground)

- **Frequency**: Ground pins do not have frequency specifications since they are used for grounding and are not involved in signal frequency measurements.

Serial Communication Ports (RX and TX):

- **Voltage**: 0V (LOW) to 5V (HIGH)
- **Frequency**: Serial communication via the RX and TX pins can typically handle baud rates ranging from 300 bps (bits per second) to 115,200 bps or higher, depending on the specific microcontroller and clock speed settings. Higher baud rates may be achievable on some boards.

I2C Communication Ports (A4/SDA and A5/SCL):

- **Voltage**: 0V to 5V
- **Frequency**: I2C communication on the Arduino Uno is typically standardized at 100 kHz in standard mode and 400 kHz in fast mode. However, the actual maximum achievable frequency can vary depending on the specific components connected to the I2C bus and the length of the bus.

PWM (Pulse-Width Modulation) Ports (D3, D5, D6, D9, D10, D11):

- **Voltage**: 0V (LOW) to 5V (HIGH)
- **Frequency**: The PWM pins on the Arduino Uno can generate PWM signals at a fixed frequency of approximately 490 Hz. The duty cycle (pulse width) of the PWM signal can be adjusted to control the average voltage output.

These are the general voltage and frequency specifications for the various types of ports on the Arduino Uno R3. Keep in mind that the actual behavior and capabilities of the ports may vary slightly based on factors such as the microcontroller's clock speed, external components, and specific board design.