***Computer Organization***

**Lab 3 Report**

***Names:***

**عبد الرحمن إسماعيل محمد حسن (22010866)**

**نور الدين اكرم السيد كامل سيف (22011309)**

**Objective**

The objective was to use the Arduino serial monitor to perform a simple arithmetic operation as well as to plot a sin wave using the Aruduino serial plotter.

**Specification**

**Part 1 — Serial Monitor:**

* Two numbers are input via the serial monitor.
* Each number can have up to 4 digits.
* The Arduino reads and outputs each number individually.
* After receiving both numbers, the Arduino adds them and displays the result.

**Components and Tools**

* Arduino UNO microcontroller board.
* Arduino IDE for programming the microcontroller.

**Design Decisions and Assumptions**

* If a number exceeds 4 digits, the additional digits are truncated.
* A buffer flushing function was implemented to remove any leftover digits and newline characters from the serial buffer.
* A delay was added to the flushing function to ensure the buffer is fully processed.

**Challenges**

* One challenge encountered was handling leftover characters in the serial buffer, especially newline characters, which interfered with reading the second number correctly

**Observation**

**Part 1 — Serial Monitor:**

* Each number, when input through the serial monitor, is correctly displayed on the Arduino serial monitor.
* The addition of two numbers is processed accurately, and the result is displayed promptly.
* Truncation occurs as expected when more than 4 digits are entered.
* The flushing mechanism and delay introduced resolve issues with leftover newline characters in the buffer.

**Part 2 — Serial Plotter:**

* The sine wave plotted on the Arduino serial plotter was smooth and continuous.
* The plot followed expected mathematical properties of a sine wave.