# ESLab HW5

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Reports with several issues and solutions presented. You may clone the project and configure per the instruction.
GitHub link: https://github.com/NOOMA-42/NTUEE-ESLab/tree/hw5
*Note: commit of different homework are in different branch.

## 1 general approach

In this project, we'd like to tailor a PWM signal and read it with logic analyzer. We had Mbed and LED connected through the board alongside with the logic analyzer. Figure1

Figure 1: Mbed, LED, logic analyzer

### 1.1 Sine Wave

Referenced from the TI's documentation, we found the duty cycle of sine wave, thus we generate a series of PWM signal infinitely to oberserve the wave.

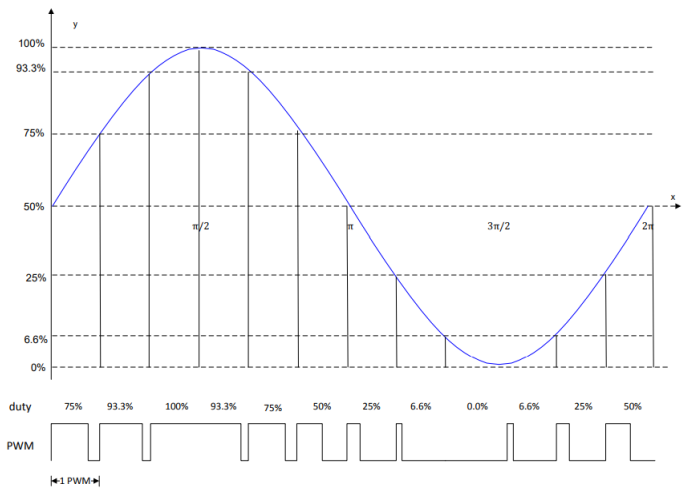


**Figure 1. 12 Sample Points Sine Wave With the Corresponding Modulated PWM**

Figure 2: Sine Wave

## 1.2 Observation-Logic Analyzer

However, the observation was not that simple as we thought, we cannot find the proper scale to observe the pattern of a sine wave. We then tune the scale of the observation of the logic analyzer to 2% and capture the

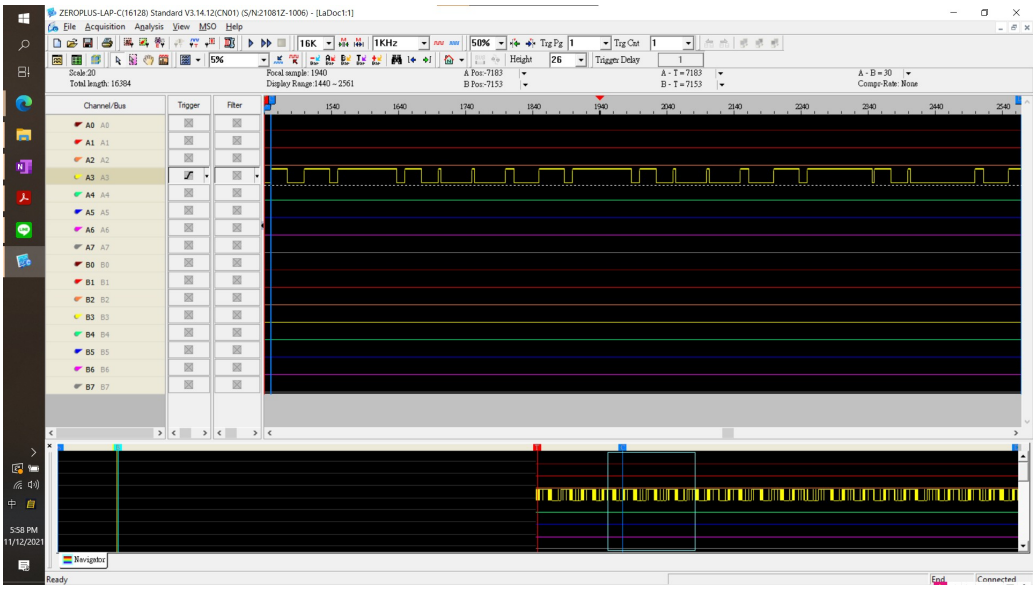

Figure 3: Logic Analyzer Output

## 1.3 First few attempt

Initially we wanted to generate the PWM signal with servo motor. The biggest challenge was the circuit and required elements, as this GitHub repo shows. Therefore, we didn't adopt it in the end. From the repo. we flso found out the motor module provided by Mbed, and the extra digitalout play the role to switch the rotation forward and backward. [1]

## 2 Potential Improvement

I'm not so sure how to directly observe the sine wave instead of observing the square wave and try to find the pattern ourselves, which is extremely unproductive. Further usage of logic analyzer might be investigated.

## References

[1] GitHub s890506. Dcmotor-control. https://github.com/s890506/DCMotor-Control.