

Birzeit University

Department of Electrical and Computer Engineering

First Semester 2020/2021

ENCS411-Computer Design Lab

**Deadline: Friday 20/11/2020**

Use Tinkercad or any other tool to implement the following project

You have two Arduinos which are connected using serial cable

Arduino#1 is connected to the following components

1-LCD, , 2-DC motor, 3-Temperature Sensor

Arduino#2 is connected to an Alarm (Buzzer) + LED

You may use other components such as resistors, function generator, power supply, relay, etc.

The system should do the following:

1. Read the temperature every 1.5 seconds (**DO NOT USE DELAY**).
2. Starting at t=6 seconds, calculate the average temperature (Tavg) during the last 6 seconds. Repeat this process every 1.5 seconds (moving average).
3. Write the Tavg on the LCD.
4. If the Tavg is larger than 29 ̊C, drive a DC motor (fan) with 20% duty cycle. And then increase the speed of the fan with 10% for every 2 ̊C increase above 29. If the temperature goes below 27 C, turn the DC motor off.
5. If the Temperature become more than 35 ̊C, then the alarm will work on Arduino#2 and the LED will be ON.

Write a report that include:

1. Abstract
2. Brief background about the components and their usage, e.g., such as relay, ADC to read a sensor value, LCD, etc.
3. Design and implementation (include at least part of the code)
4. Testing (include screenshots)
5. Conclusion
6. References
7. Appendex (you can include here the entire code)

**Important: Each screenshot should include the date and time of your computer.**

**Important: Include comments inside the code as much as possible.**

☺ Good Luck ☺