AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH

408/1, Kuratoli, Khilkhet, Dhaka 1229, Bangladesh

Assignment Title:	Familiarization with Visual Designer for Arduino™ AVR and implementation of a temperature sensing...
Assignment No: 04	Date of Submission: 28-02-2021
Course Title:	Microprocessor and Embedded Systems
Course Code:	Section: C
Semester: 8th 20___-___	Course Teacher: Nadia Nowshin

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Group Name/No.: 03

No	Name	ID	Program	Signature
1	Mohammed Afridul Haque	18-38794-3		
2	Tania Rahman	17-33841-1		
3	Chowdhury Ullas	17-35528-3		
4	Rahman, Md. Ashiqur	17-35477-3		
5	Raihan MD Hemel	17-33607-1		
6	Nowrin Muhaimin Shailee	18-37259-1		
7	Md Refatul Islam	18-37818-2		
8	Anwar Hossain	17-35487-3		
9	Ragib, Azmaill Damil	17-35503-3		
10				

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	Total Marks	

Title: Familiarization with Visual Designer for Arduino™ AVR and implementation of a temperature sensing and control system using Drag - Drop - Play.

Equipment:

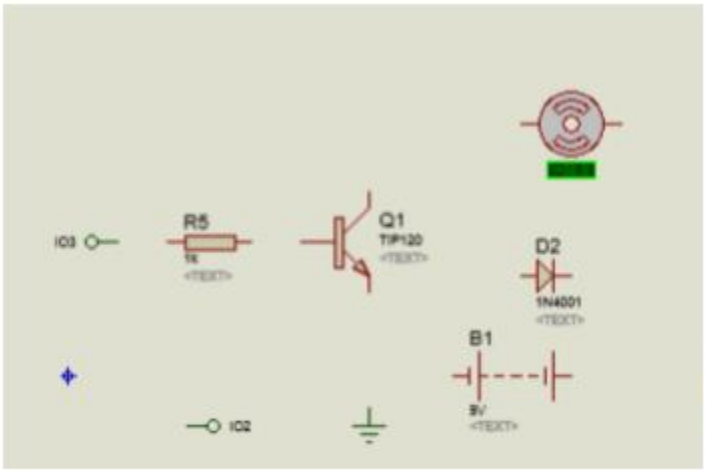
Desktop PC, Proteus Professional 8.9

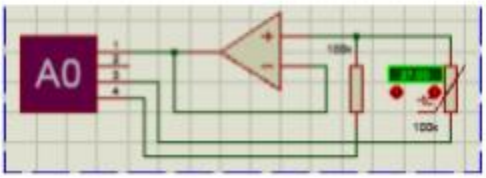
Theory and Methodology:

The hardware designing is the trickiest part. The Arduin makes it a lot easier to solve problem with lots of ready-made shields. Proteus professional is preferred by Visual Designer for the software domain and using proteus professional schematic capture and Proteus VSM simulation engine to make simulation of complete Arduino systems possible, also Visual Designer provides high level methods to enable the control of the embedded system from a flowchart editor.

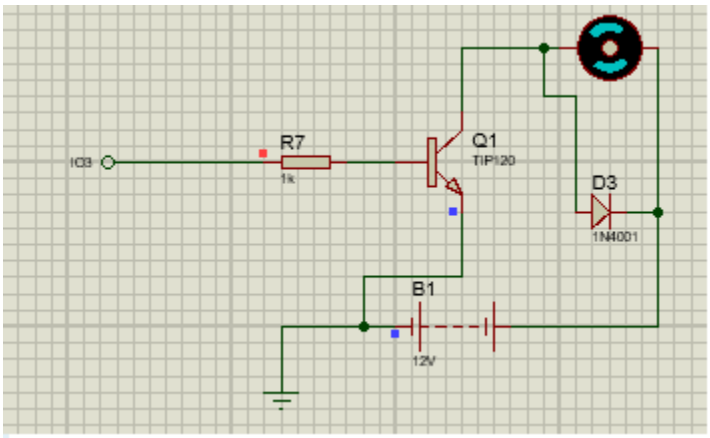
Components:

Register, TIP120 transistor, 1N4007 diode, battery, DC motor, thermistor-based transistor sensor, ground and Arduino uno

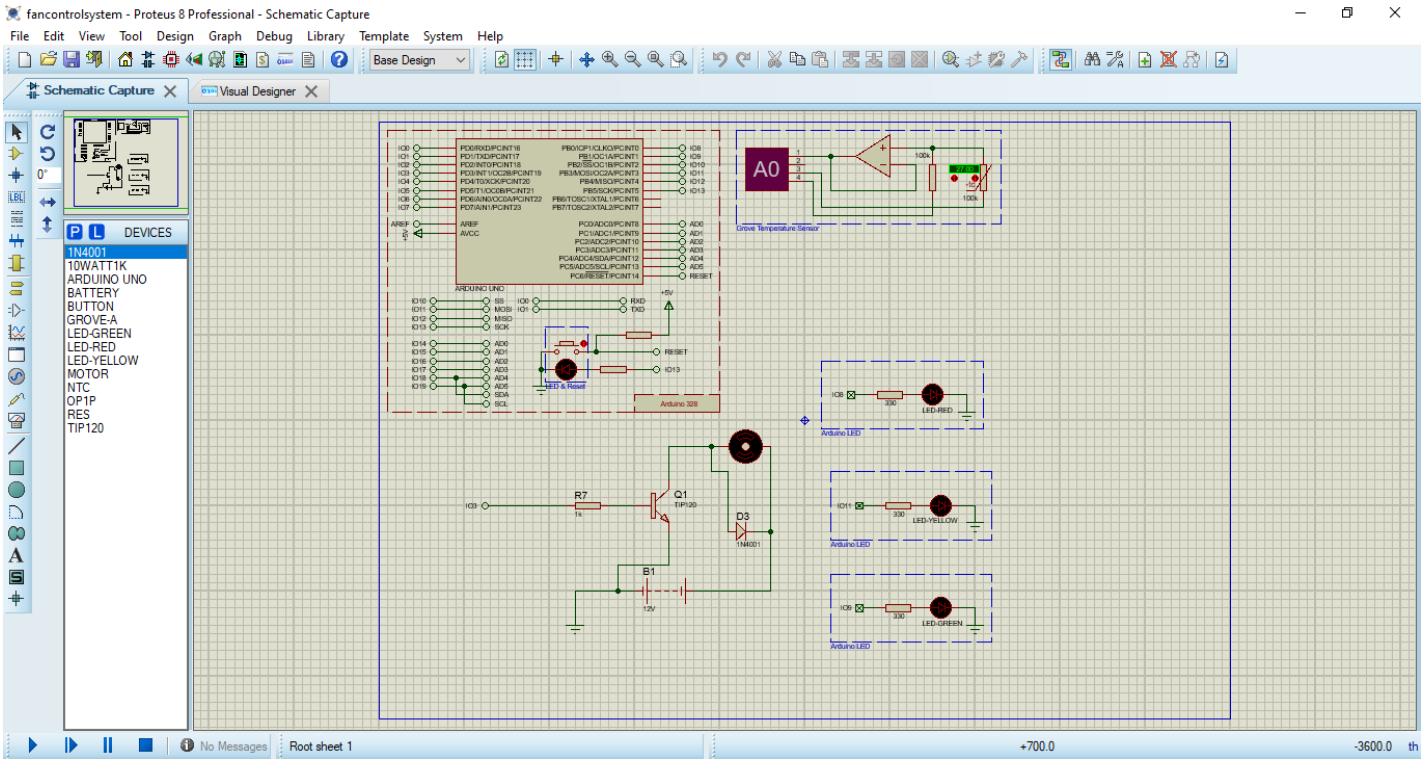




FAN CONTROL CIRCUIT

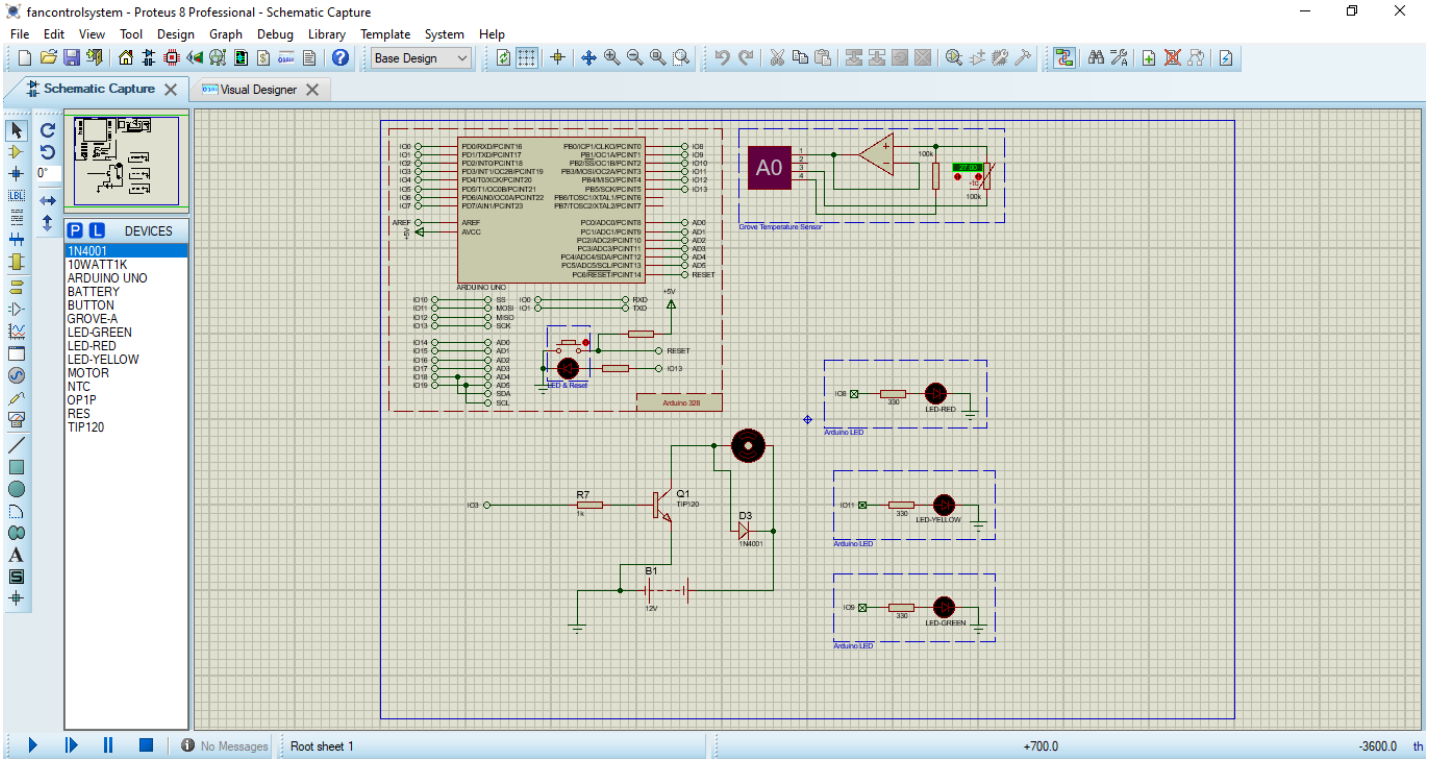


Problem Statement:

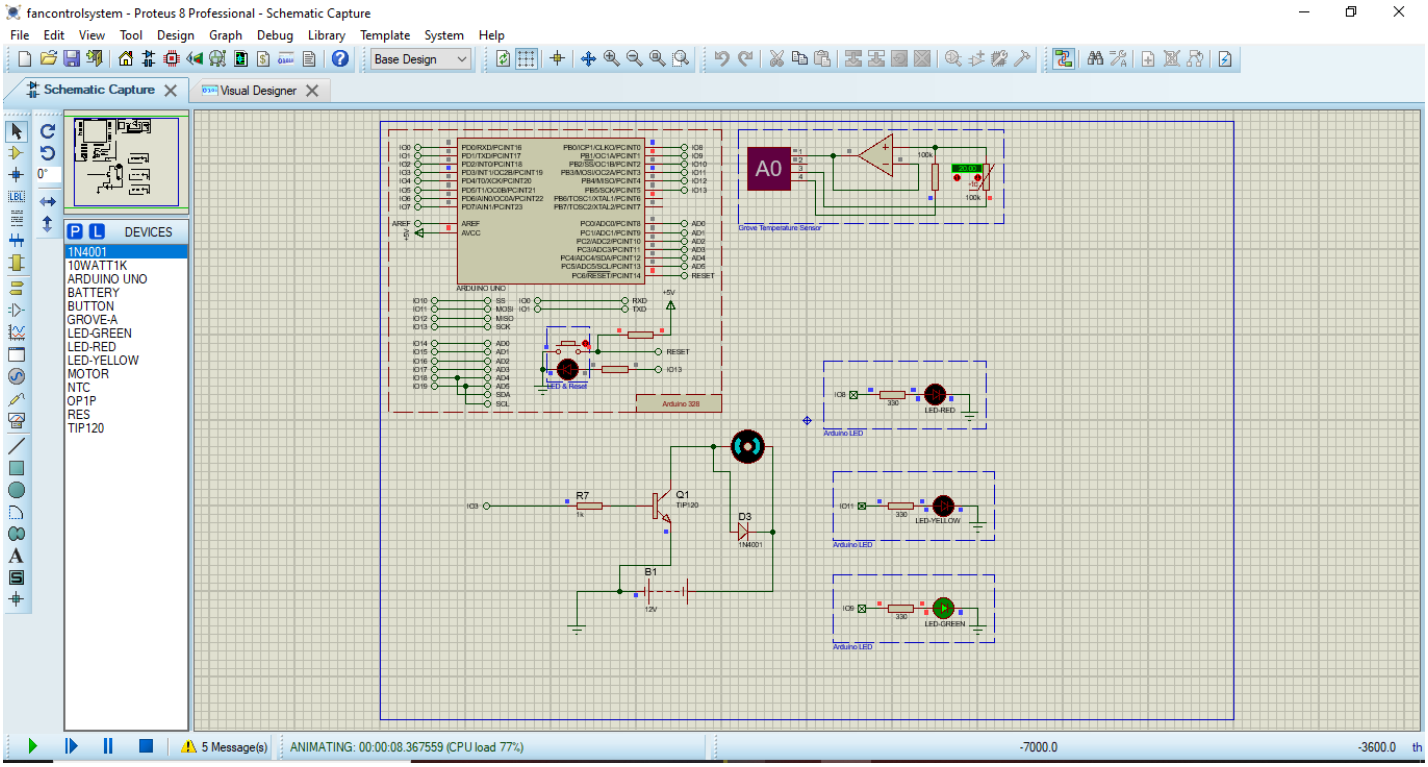


Steps:

1. Temperature sensor will monitor the temperature.
2. Condition (i) Temperature >=40 turn on red led, Fan speed: Full (255)
   (ii) 40>Temperature >=30 turn on yellow led, Fan speed: Half (128)
   (iii) Temperature < 30 turn on green led, Fan speed: Off (0)

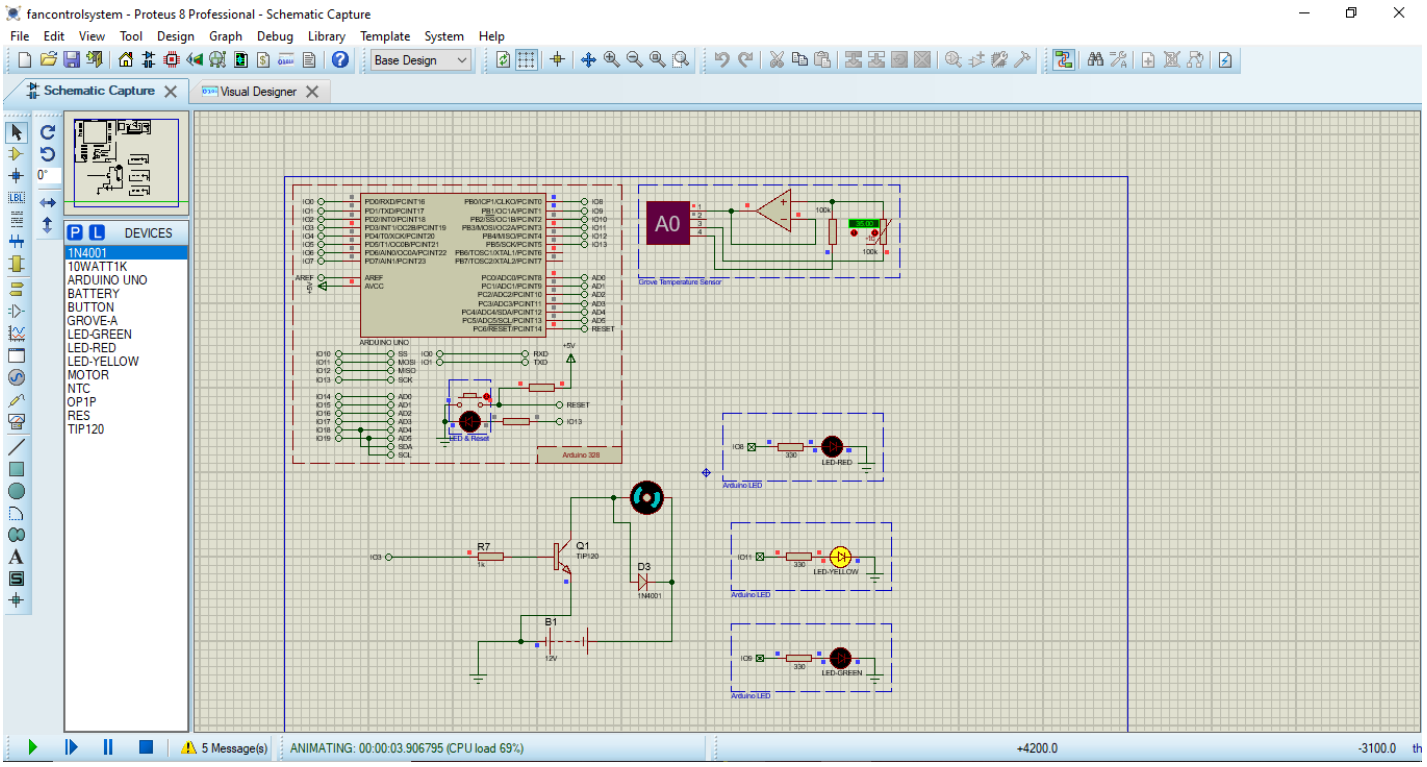


Test 1: When temperature is lower than 30°, the green light will lead up.



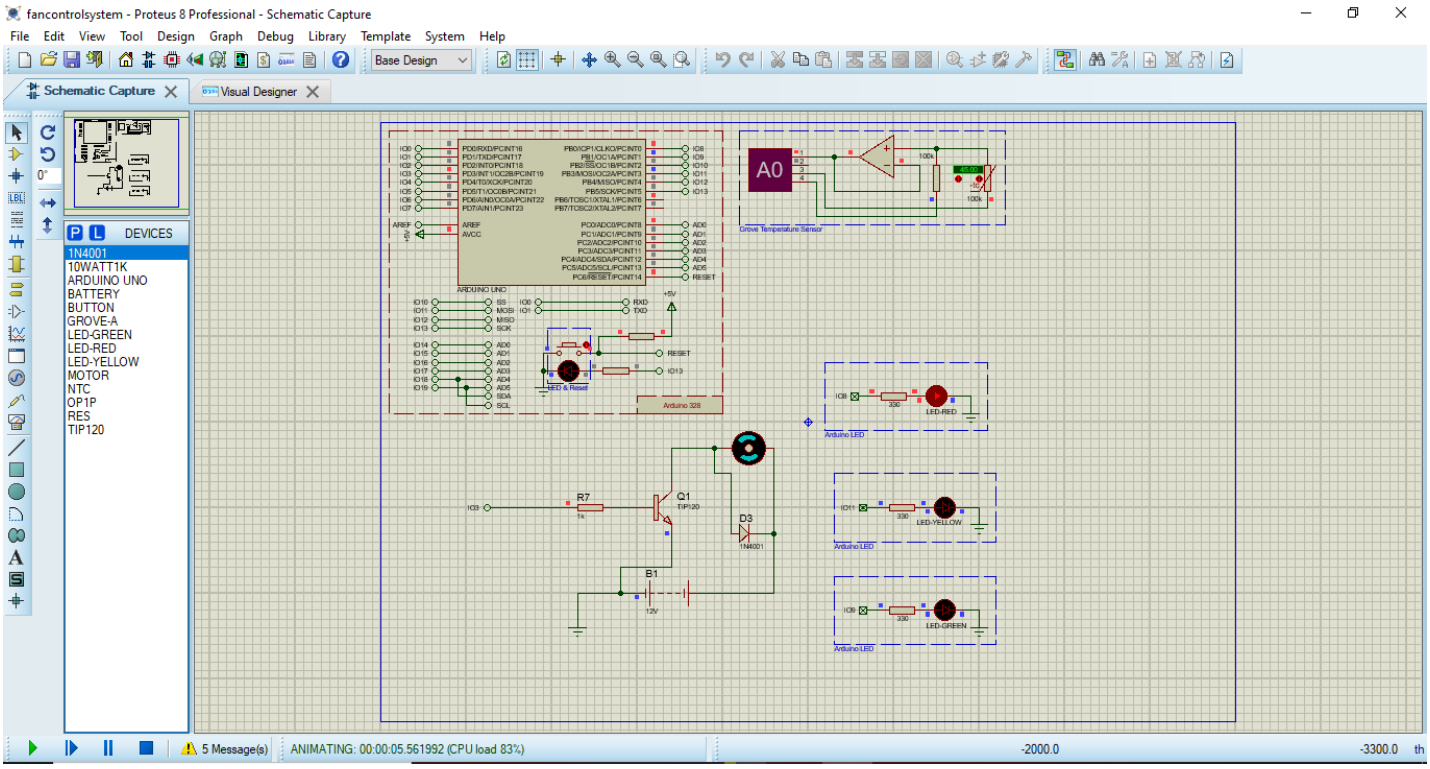
The given temperature is 20°, which is below 30°. So, the motor is not running and the green light is on.

Test 2: When temperature is between 30° and 40°, the green light will lead up.



The given temperature is 35°, which is between 30° and 40°. So, the motor will start running in half the speed and the yellow light will turn on. Also, the motor will delay in every 4s.

Test 3: When temperature is above 40°, the red light will lead up.



The given temperature is 45°, which is more than 40°. So, the motor will start running in full speed and the red light will turn on. Also, the motor will delay in every 4s.

Discussion:

The experiment succeeded in showing how a fan control circuit works. Visual Designer automatically changes speed of the fan judging by the temperature. Using Proteus Professional was a great experience. Visual Designer helped us understand more and deep about logic circuits. Visual Designer will check to make sure that pins are not used by more than one shield or sensor.

Reference(s):

1) https://www.arduino.cc/.

2) https://www.labcenter.com/visualdesigner/