American International University- Bangladesh
Department of Electrical and Electronic Engineering
EEE 4103: Microprocessor and Embedded Systems Laboratory

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

Introduction:

The objective of this experiment is to get familiarized with Proteus Visual Designer.
Implementation of temperature sensing and control system using Drag - Drop – Play method.
Harness the power of Proteus VSM and design our own hardware on the schematic.

Theory and Methodology:

Often the trickiest part of embedded development is the hardware design. The Arduino™ ecosystem goes a long way to solving this problem with lots of ready-made shields. Visual Designer takes this into the software domain, using proteus professional schematic capture and Proteus VSM simulation engine to make simulation of complete Arduino systems possible. The Peripheral Gallery in Visual Designer then simplifies the whole process as it will auto place and auto connect the electronics on the schematic for you. Finally, Visual Designer provides high level methods to enable the control of the embedded system from a flowchart editor.

Problem Statement:

Design a Temperature Sensing and Control System

Visual Warning:

If Temp >= 40 Then turn ON RED light

If Temp >= 30 and Temp <40 Then turn ON Yellow light

If Temp < 30 Then turn ON Green light

Cooling Fan:

If Temp >= 40 Then Run cooling fan at full speed

If Temp >= 30 and Temp <40 Then Run cooling fan at half speed

If Temp < 30 Then turn OFF cooling fan

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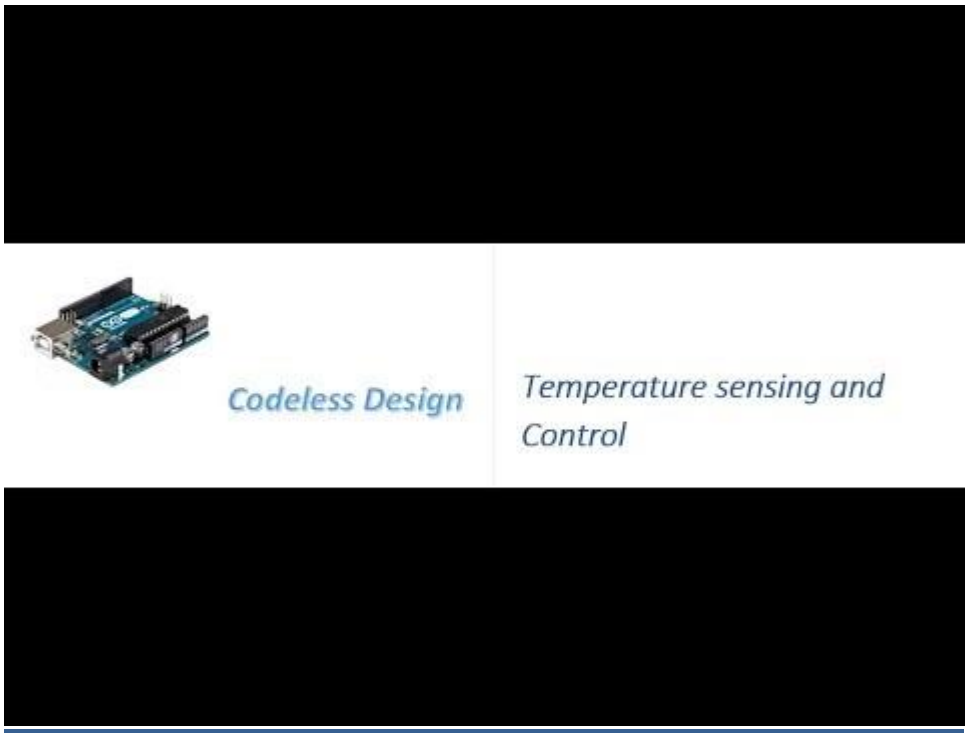
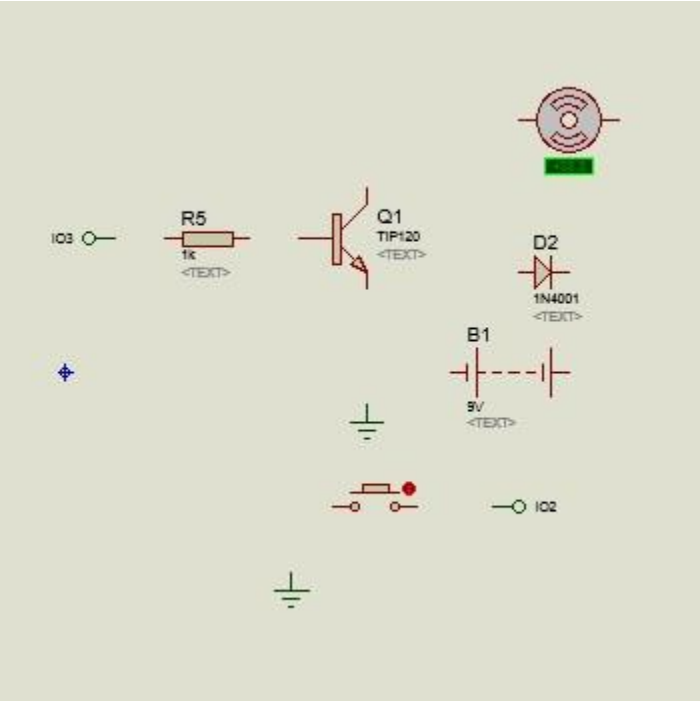
Visual design procedure of temperature sensing and control system

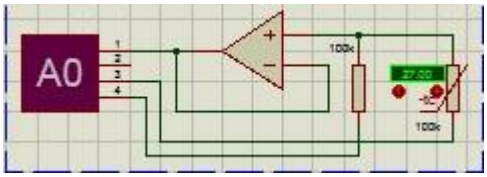


Questions for report writing:

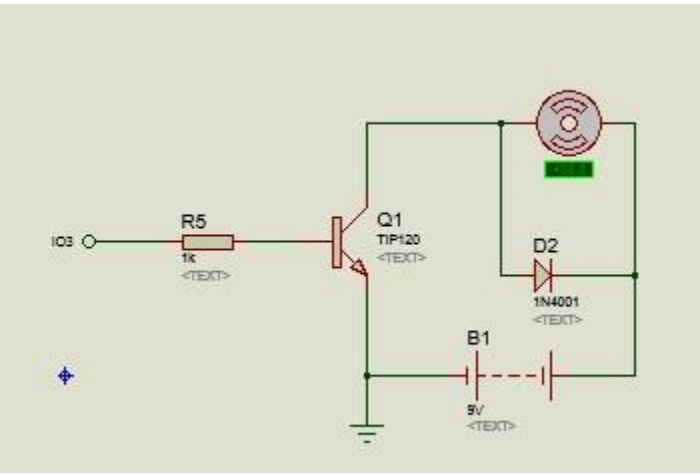
1) Modify the design to implement a low-cost fan control system as follows:

COMPONENTS

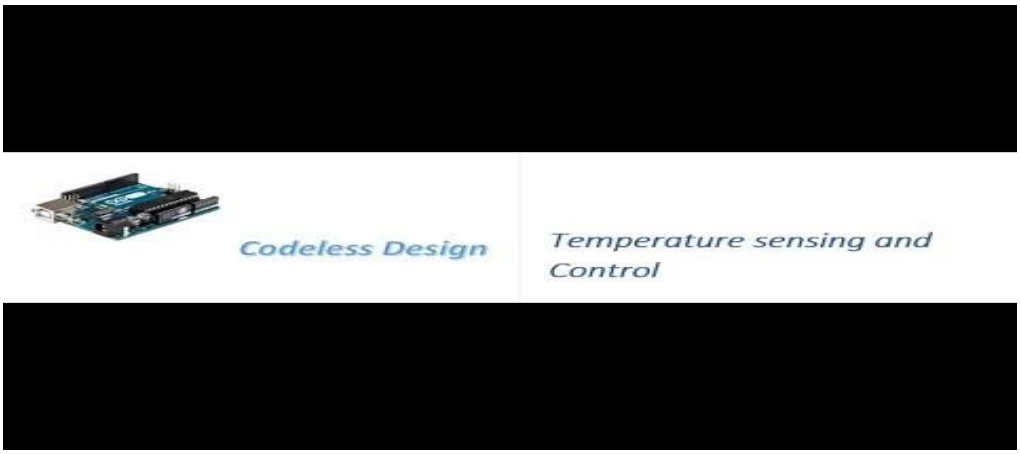




FAN CONTROL CIRCUIT



2) Replace the DHT 11 sensor with a Thermistor based temperature sensor.
3) Design flowchart to implement following functionality:



Reference(s):

1) https://www.arduino.cc/.
2) https://www.labcenter.com/visualdesigner/