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Design and Implementation of Digital Alarm Clock with Thermometer

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ABSTRACT: Celsius scale thermometer displays the ambient temperature through a LCD display. It consists of two sections. One is that which senses the temperature. This is a temperature sensor LM 35. The other section converts the temperature value into a suitable number in Celsius scale which is done by the in-built ADC of the microcontroller. The LM 35 IC generates a 10mV variation to its output voltage for every degree Celsius change in temperature. The Output of the temperature sensor is analog in nature so we need an analog to digital convertor for converting the analog input to its equivalent binary output. This project incorporates the functionality of a digital clock and a digital thermometer. The digital clock works in 12 hour mode and is configured by programming the ATMEGA 328 microcontroller.

Keywords: Atmega 328, Microcontroller, LM 35, LCD(Liquid crystal display)

I. INTRODUCTION

This project incorporates the functionality of a digital clock and alarm. The digital clock works in 12 hour mode and is configured by programming the ARDUINO (Atmel ATmega328) microcontroller. A thermometer is a device that measures temperature. Here to read the value, we convert surrounding temperature to digital value by the help of a temperature sensor. Sensors, from their name convey that they sense the temperature in the surroundings. The sensors give the output in relation to the centigrade scale. These sensors are easily available. These sensor output can be used in measuring the temperature, Hence these sensors are used in digital thermometers.

This can be achieved by interfacing the sensor to a micro controller. The sensor we used in this application is LM35. The output scale of the thermometer can be set as Centigrade or Kelvin or Fahrenheit scale based on the programming of the micro controller. It is performed using ARDUINO board.

The code is compiled and burned. The output is observed through Serial Monitor. Serial Monitor displays the output after the processing of the output of the sensor through the code burned in the controller. The output temperature can be taken from the SERIAL MONITOR in the panel of the Arduino.

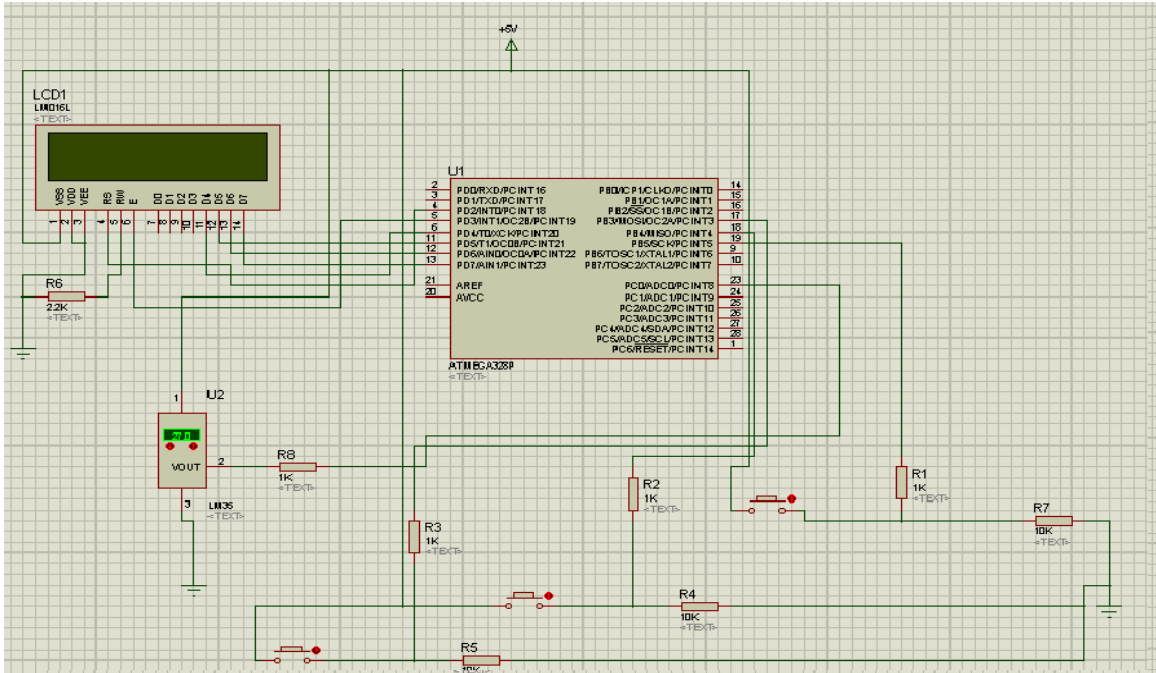
The Sensor is mainly used in applications which involve temperature monitoring like fire alarm. If temperature exceeds the threshold temperature set by the user, then the alarm is triggered.

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II DESIGN AND IMPLEMENTATION OF THE CIRCUIT



III EXPERIMENT

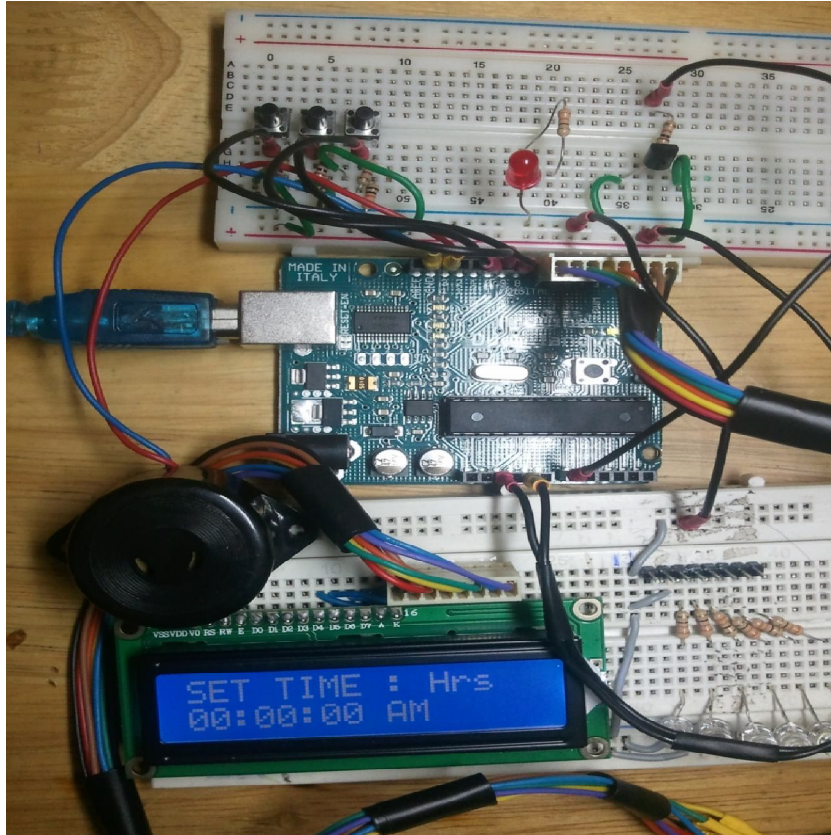
Connections are done as in the circuit diagram and the circuit is switched on. The source code is compiled and burned into the microcontroller.

After the program is burned, LCD displays “SET TIME”. Time is set using the push buttons (tactile switches) in the circuit. After the time is set, LCD displays “SET ALARM”. Alarm is also set with the help of push buttons. Alarm goes on for that particular time at which the alarm has been set. The LCD also displays the temperature of the surroundings at bottom right of the screen. The alarm also goes ON if the temperature exceeds 40 degree Celsius. We can introduce a lighter fire or any heat source near the LM-35 temperature sensor for observing this.

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V CONCLUSION

The desired output for LCD Based Digital Alarm Clock with Digital Thermometer is obtained. The system worked as per the requirements specified. Alarm goes on for the particular time set as well as when the temperature goes above 40 degree Celsius. Therefore, this can be used also as a fire alarm.

Limitations: Each time the power goes OFF ,we have to reset the clock while turning ON.

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