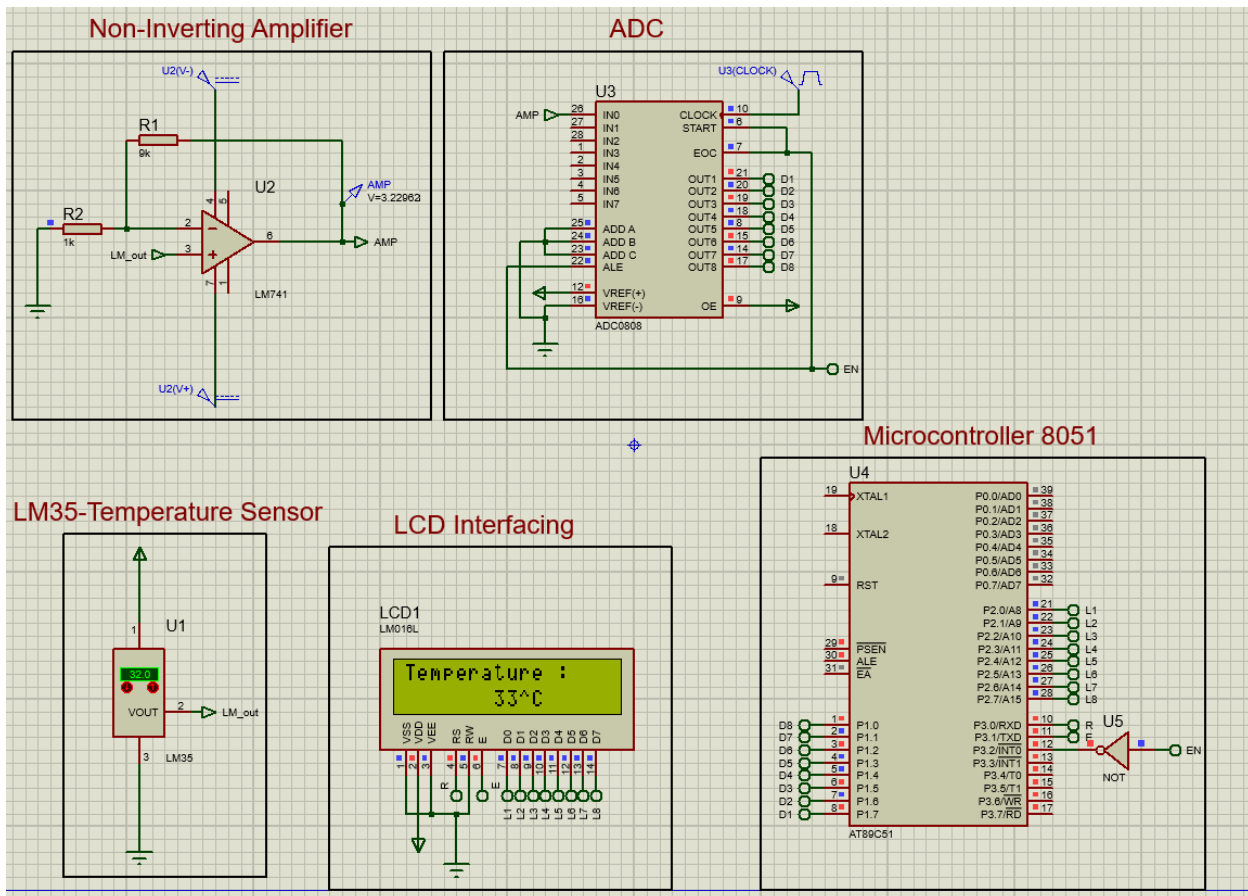# TEMPERATURE MONITORING USING 8051 AND LM35

Interfacing 8051 with ADC0808 ,LCD , and LM35.

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INTRODUCTION

LM35 is a temperature sensor which gives an output in millivolts with corresponding temperature value. I have used a non-inverting op-amp amplifier and ADC0808 which is 8bit ADC for converting into digital form and a Numeric 16x2 LCD for displaying.

REQUIREMENTS

1. 8051 Microcontroller.
2. ADC0808
3. LCD 16x2
4. LM741 OP-AMP
5. LM35 Temperature Sensor
6. NOT GATE (BJT or IC)
7. Keil uVision IDE
8. Proteus Simulation Software

DATA

LM35 Temperature (deg C)	Monitored Temperature (deg C)
10	10
25	25
32	33
42	43
43	43

RESULTS

Above simulation can monitor output temperature upto range 0 to 50 degree Celsius.Sometimes the monitored temperature is 1 degree greater than actual temperature seen on LM35.

CONCLUSION

1. This project uses assembly language, that is why the code is complex but has a better control on memory.
2. For monitoring temperature I used two ports of 8051 and a few gpio pins.
3. One port is vacant which can be used with other I/O devices with this.
4. It is designed to measure from 0 to 50 degree Celsius.

FUTURE SCOPE

1. For measuring negative values of temperature we can use an adder with amplifier using OP-AMP to clamp the negative range of values and make them positive and process the negative values in the controller respectively.

   For eg.For -50 to 50 C the voltages will be -5mV to 5mV using adder opamp. We make it 0 to 10mV and process 0 to 5mV values as negative values -50 to 0 C in our controller.

2. We can reduce the complexity of the code using C /C++ language.
3. We can use higher resolution ADC for precise measurements.
4. We can increase the range by decreasing the multiplication factor (gain) of the amplifier.

REFERENCES

1. LM35 Datasheet.
2. 16 bit division assembly language code.

   https://www.engineersgarage.com/simple-programs-in-8051-assembly-language/