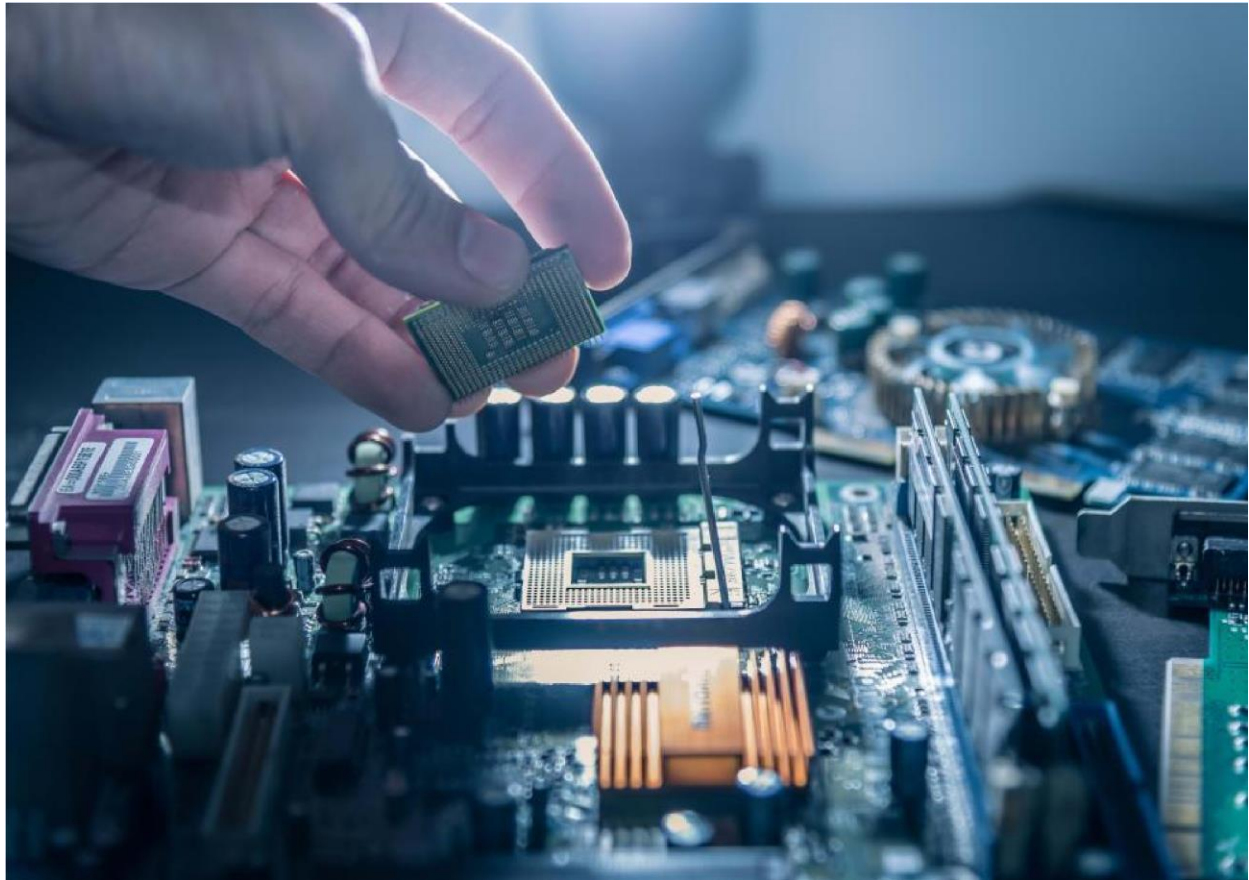


EMBEDDED SYSTEMS LAB

Experiment V: Temperature Controller



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Embedded Systems Laboratory (EC39202)

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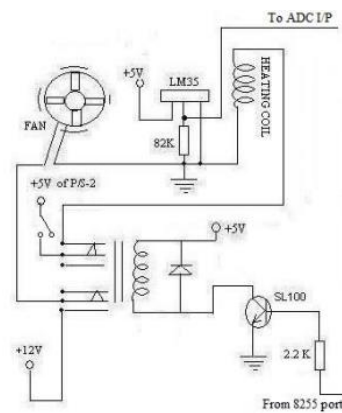
Part-A

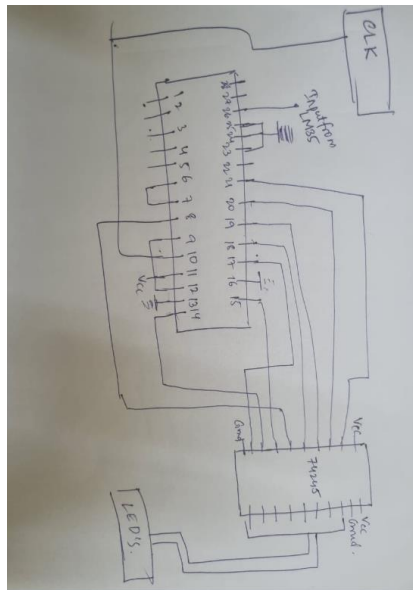
OBJECTIVE

Construct heater driver and fan driver circuits and drive both of them through one relay and by one digital signal so that, either one of them is turned on. Also connect the temperature sensor circuit according to the given diagram

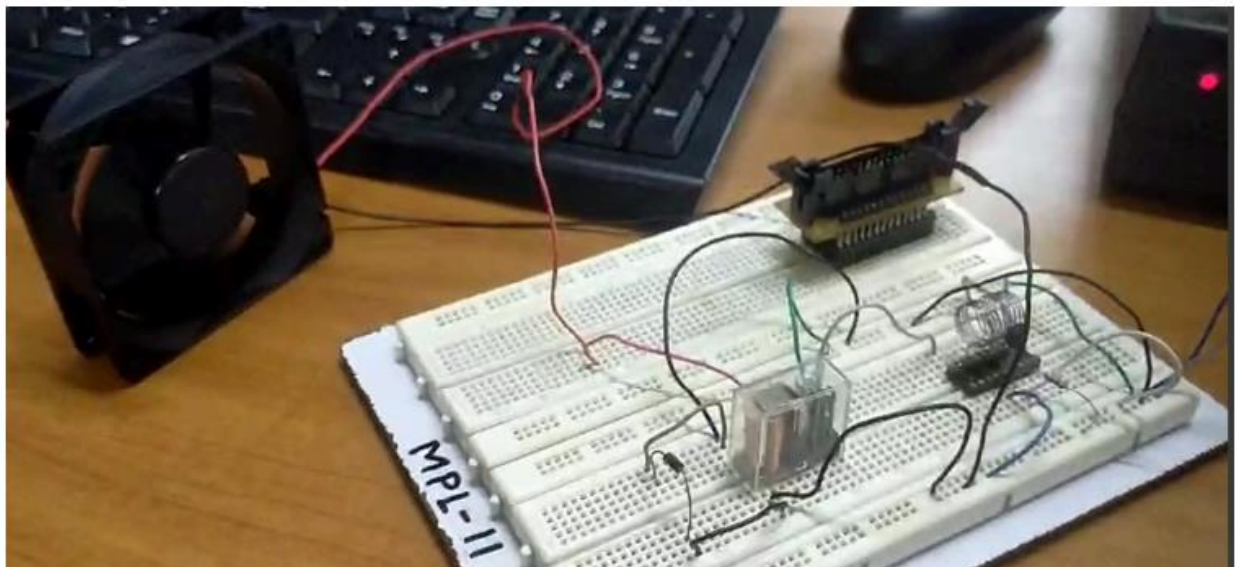
Connect the input of ADC to the output of temperature sensor circuit instead of potential divider. Place the fan near the heating coil and temperature sensor combination

CIRCUIT DIAGRAM





RESULTS:



ROTATING FAN



HEATING COIL

DISCUSSION:

The LM35 is a semiconductor-based temperature sensor that provides a linear output voltage proportional to the Celsius temperature. Pre-calibrated to change by 10 mV per degree Celsius, it offers a voltage range of 0 to 5 volts, covering -55°C to 150°C. With minimal self-heating and easy interfacing with electronics, it's widely used for accurate temperature sensing in diverse applications.

A relay uses an electromagnet to mechanically toggle electrical contacts. When energized, the coil generates a magnetic field, attracting an armature that alters the state of the contacts. This either completes or interrupts the circuit, allowing control of high-power devices with low-power signals. Relays come in normally open (NO) and normally closed (NC) configurations and find use in automotive, industrial, and home automation systems.

The LM35 temperature sensor, when paired with an Analog-to-Digital Converter (ADC), has diverse applications due to its accuracy and simplicity. It is utilized in environmental monitoring, industrial process control, home appliances, medical devices, automotive systems, food industry, energy management, and research and development. These applications involve temperature monitoring and regulation in various settings, contributing to improved efficiency, safety, and quality across industries.

Relays are essential electromechanical switches used in industrial automation, home automation, automotive electronics, telecommunications, power distribution, security systems, medical equipment, aerospace, defense, consumer electronics, and renewable energy systems. They control high-power devices with low-power signals, ensuring reliable switching and protection in various applications.

