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| To be filled by Student | | |
| **Course** | Electronics ΙΙ (EEE232) | |
| **Instructor** | Engr. Ihtesham Jadoon | |
| **Project Title** | Rain detector circuit with alarm and automatic rain sensing wiper. | |
| **Project Proposal Summary** | In this project, we will design and implement rain detector circuit with alarm and automatic rain sensing wiper. Our project brings forward this system to **automate the wiper system having no need for manual intervention**. For this purpose we use rain sensor along with 555 timer, comparator and driver IC to drive the wiper motor. Our system uses rain sensor to detect rain. | |
| Recommendations by Instructor | | |
| Range of Complex  Problem Solving | Range of Conflicting Requirements | * Rain sensor is used for sensing rain drops. It is electrically isolated and available as printed circuit boards. The working of a rain sensor can be adequately compared to the working of a switch. * Transistor is used to **increase the capacity of current amplification enormously**. When water drops or rain drops fell on the sensor, then the base of the transistor will connect to the sensor .Then transistor is used as a switch as a circuit and also provides supply to it. * The sensing pad with series of exposed copper traces, together acts as a variable resistor (just like a potentiometer) whose **resistance varies according to the amount of water on its surface**. This resistance is inversely proportional to the amount of water. * To secure the components in this circuit, current limiting resistors are used. * Whenever the rain sensor detects rain, it sends the signal to 555 Timer IC which is configured in A-Stable mode. The triggered IC will start the buzzer which is indicating the raining condition. |
| Depth of Analysis Required | * Required voltage for rain sensor must be 5V. * The rain drop module has a potentiometer that is responsible for adjusting the output of the digital pin. To receive accurate readings, this potentiometer should be calibrated * Comparator output signal clean waveform is good, driving ability, over 15mA. |
| Depth of Knowledge Required | * Calculation of resistance, voltage and current must be known at every point in circuit. * Resistances of 555 timer IC and sensor should be known otherwise they can damage. * Due to large consumption of electricity can rise the heat which effect our output signal , to prevent this large metal pads are used. |
| Interdependencies | * Transistor PNP (BC557) * Resistors (2.2MΩ, 1kΩ, 10kΩ) * 555 Timer (NE555) * Comparator IC LM358 * Motor Driver IC L293D * Capacitors (0.47µF, 0.01µF) * DC Supply |
| Range of Complex Problem Activities | Range of Resources | * Connecting Wires and sensor. * Vero Board and DC Motor. * Resistors for safety. * DC battery for input. |
| Level of Interactions and Innovations | * Our project uses the knowledge of both electrical and computer engineering. |
| Consequences of Society | * Rain sensors **enhance safety and comfort while driving**. These sensors automatically switch on the wiper in case of a water splash on the windshield. Rain sensors are also widely used in the agriculture and gardening sectors by providing multiple benefits not only to the users but also to the environment. * That’s a convenience and potentially a real safety benefit when driving through heavy rain on a dark highway. |
|  | Familiarity | * The project deals with an idea of Electronics as well as Electrical Engineering. By using the concepts of these, we can design our professional hardware and do analysis on it. |