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Design and Evaluation of a Low-cost Weather Station

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The quality of life and human activities are significantly impacted by several elements, one of which is the weather and climatic patterns. To measure the weather parameters requires weather stations which are expensive. Hence, there is a need to develop low-cost weather stations to make comprehensive meteorological data monitoring easy to attain across the world. The aim of this project was to design a low-cost weather station to monitor temperature and relative humidity. The weather station was designed to record data in real-time, store the acquired data in an SD card and also to display the data on an LCD. The study used an Arduino Uno board connected to a temperature and humidity sensor, a real-time clock (RTC), a micro-SD card module, and an LCD. The device was also capable of text file storage. The Arduino IDE was used to create a code that was transmitted to the Arduino microcontroller to operate the circuit. The performance of the weather station was tested by mounting it beside a standard weather station to measure the temperature and relative humidity. The data obtained were compared to the standard weather station data for calibrations. Following calibration, this low-cost weather station can be deployed in rural areas to measure weather parameters, augmenting the existing weather stations for more accurate climate predictions.

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