Experiment: 1.2

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1. Aim:

Identification of different sensors used in IoT applications.

2. Objective:

1. To study hardware related to IoT

2. To understand and identify different sensors used in IoT.

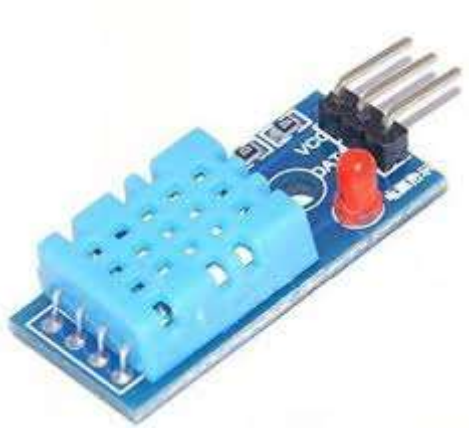
3. Script and Output:

Sensors:-

The sensors are defined as a machine, module, or a device that detect changes in the environment. The sensors transfer those changes to the electronic devices in the form of a signal. A sensor and electronic devices always work together. The output signal is easily readable by humans. Nowadays, Sensors are used in daily lives. For example, controlling the brightness of the lamp by touching its base, etc. The use of sensors is expanding with new technologies.

The sensor is a device, which is made up of **Single Crystal Silicon**. It is considered as a widely used semiconductor material. It has superior mechanical stability, machinability, etc. It can also combine electronicsand sensing elements on the same substrate. The sensors are used to measure the physical quantities, such as pressure, temperature, sound, humidity, and light, etc. An example of sensors is Fire Alarm, a detector present on the fire alarm detects the smoke or heat. The signal generated from the detector is sent to the alarming system, which produces an alert in the form of alarm. The types of detectors are smoke detectors, heat detectors, carbon monoxide detectors, multi-sensors detectors, etc.

1.TEMPERATURE SENSORS:-



By definition, "A device, used to measure amount of heat energy that allows to detect a physical change in temperature from a particular source and converts the data for a device or user, is known as a Temperature Sensor."

Only a couple of years ago, their uses mostly included A/C control, refrigerators and similar devices used for environmental control. However, with the advent of the IoT world, they have found their role in manufacturing processes, agriculture and health industry.

In the manufacturing process, many machines require specific environment temperature, as well as device temperature. With this kind of measurement, the manufacturing process can always remain optimal.

On the other hand, in agriculture, the temperature of soil is crucial for crop growth. This helps with the production of plants, maximizing the output.

2.PROXIMITY SENSORS:-

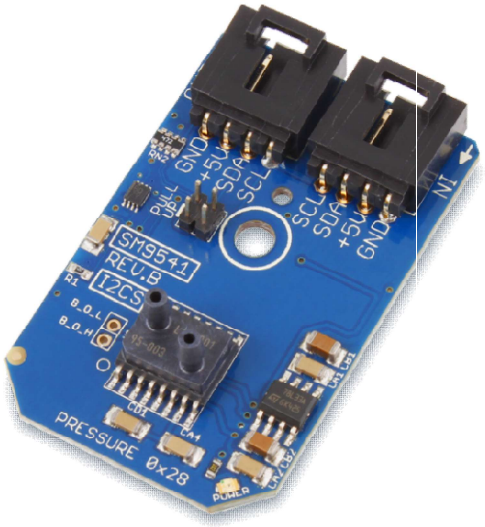
A device that detects the presence or absence of a nearby object, or properties of that object, and converts it into signal which can be easily read by user or a simple electronic instrument without getting in contact with them.

Proximity sensors are largely used in the retail industry, as they can detect motion and the correlation between the customer and product they might be interested in. A user is immediately notified of discounts and special offers of nearby products.

Another big and quite an old use-case is vehicles. You are reversing your car and are alrmed about an obstacle while taking reverse, that's the work of proximity sensor.

They are also used for parking availability in places such as malls, stadiums or airports.

3.PRESSURE SENSORS:-



A pressure sensor is a device that senses pressure and converts it into an electric signal. Here, the amount depends upon the level of pressure applied.

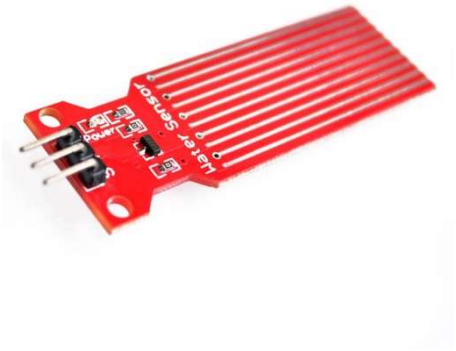
There are plenty of devices that rely on liquid or other forms of pressure. These sensors make it possible to create IoT systems that monitor systems and devices that are pressure propelled. With any deviation from standard pressure range, the device notifies the system administrator about any problems that should be fixed.

Deployment of these sensors is not only very useful in manufacturing, but also in the maintenance of whole water systems and heating systems, as it is easy to detect any fluctuation or drops in pressure.

4.WATER QUALITY SENSORS:-

Water quality sensors are used to detect the water quality and Ion monitoring primarily in water distribution systems.

Water is practically used everywhere. These sensors play an important role as they monitor the quality of water for different purposes. They are used in a variety of industries.



5.HUMIDITY SENSORS:-

Humidity is defined as the amount of water vapour in an atmosphere of air or other gases. The most commonly used terms are “Relative Humidity (RH)

These sensors usually follow the use of temperature sensors, as many manufacturing processes require perfect working conditions. Through measuring humidity, you can ensure that the whole process runs smoothly, and when there is any sudden change, action can be taken immediately, as sensors detect the change almost instantaneously.

Their applications and use can be found in Industrial & residential domain for heating, ventilating, and air conditioning systems control. They can also be found in Automotive, museums, industrial spaces and greenhouses , meteorology stations,Paint and coatings industries, hospitals & pharma industries to protect medicines.

6.SMOKE SENSORS:-

A smoke sensor is a device that senses smoke (airborne particulates & gases), and it's level.

They have been in use for a long period of time. However, with the development of IoT, they are now even more effective, as they are plugged into a system that immediately notifies the user about any problem that occurs in different industries.

Smoke sensors are extensively used by the manufacturing industry, HVAC, buildings, and accommodation infra to detect fire and gas incidences. This serves to protect people working in dangerous environments, as the whole system is much more effective in comparison to the older ones.