Interface for Smart Coffee Maker

Done in Group G7
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Introduction:

One of the most important aspect in any industry is automation of tools. As the time changes, everyone is preferring automated tools rather than man-made tools. This automation reduces the human interaction which in turn reduces the errors and provides more accuracy. This automation increases the flexibility and comfort to the customers. IOT refers to connecting all the computers without any intelligence using internet. This IOT is the most prominent field through which we can connect with all the devices and can share the data easily [1]. Sensors play an important role in IOT.

In this project, we aim to transform normal coffee maker into IOT device. To make this possible, we have used Arduino which consists of different types of sensors like temperature sensor which record the values and send to the mobile device. By using this Arduino, we focus to monitor the different parameters of the coffee machine like temperature etc.., Finally we aim to control the coffee maker via internet. This can be done by implementing web interface using PHP and HTML.

Monitoring Parameters:

1. Temperature of the coffee in the coffee maker.
2. Power consumption of the coffee maker.
3. Time for which the coffee maker is switched on.
4. Status of the coffee maker.

Creating web interface:

Implementing R UNO such that we can access it from Android. We can access the sensor values through internet such that we can track all the values. This R UNO has built in safety feature which turn off the coffee machine if the temperature exceeds the threshold limit.

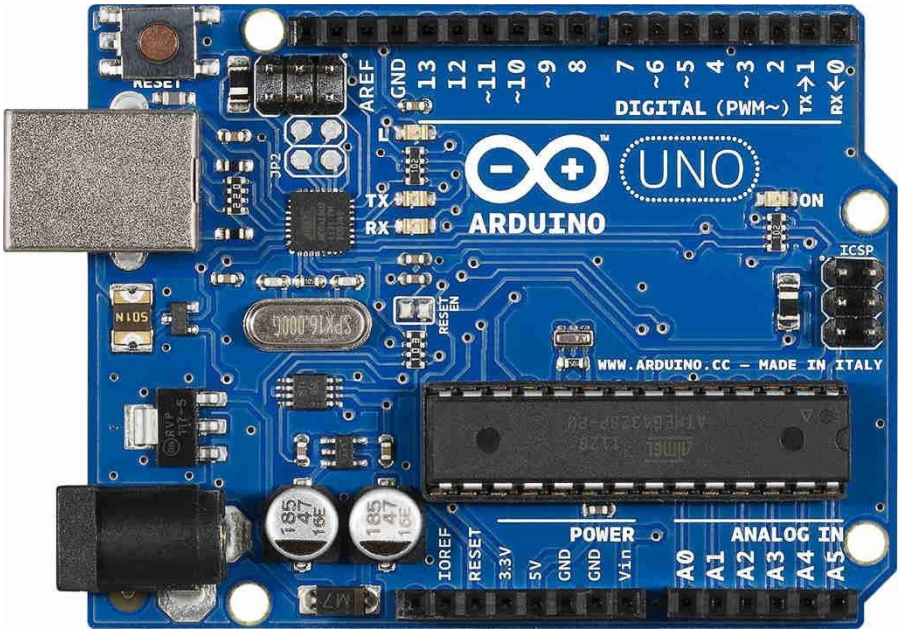

Fig 1: Arduino Sensor [2]

Goal of the Project:

The goal of the project is to monitor the several parameters mentioned above and to control the coffee maker without using any wired connection. The goal is achieved by implementing sensors in IOT device.

Analysis:

Temperature of the coffee in coffee maker:

The temperature of the coffee is measured by using temperature sensor tmp36 [3]. This temperature sensor is placed just below the coffee pot such that it slightly touches the coffee pot so that it will record the temperature. From the experiment, we can observe that the temperature of the coffee that is brewed is 90 degrees.

Power consumed by the coffee maker:

The power consumed by the coffee maker is calculated by using current sensor which is connected in the relay unit. The power values are recorded from these current sensors. Form the experiment, we can observe that the power consumed by the coffee maker varies from 700-900 watts/hour.

Time for coffee maker is ON:

The time for which the coffee maker is switched on is calculated by using simple clock where the time will run in hours, minutes and seconds. Initially, when the coffee maker is OFF, clock is set to 0, and when the coffee maker is

ON, the clock will start. The time is displayed to the users in hours, minutes and seconds so that the user can turnoff the machine at any time he wants. Also, we can set a feature to set the coffee machine OFF if the coffee machine is switched ON for 30sec.

Status of the coffee maker:

The status of the coffee maker is determined by using GL5516 photoresistor. By using this photoresistor we will measure the intensity of light reflected on the pot. It reflects “1” if the coffee pot is in position and it reflects “0” if the coffee pot is not in position.

References:

[1] M. Burgess, “What is the Internet of Things? WIRED explains,” *Wired UK*, Feb. 16, 2018.

[2] “[Hot Item] Arduino Uno R3 Development Board Microcontroller for DIY Project,” *Made-in-China.com*. https://sunhokey.en.made-in-china.com/product/bjkxIyAKQdhF/China-Arduino-Uno-R3-Development-Board-Microcontroller-for-DIY-Project.html (accessed Feb. 21, 2021).

[3] “TMP36 Temperature Sensor,” *Adafruit Learning System*. https://learn.adafruit.com/tmp36-temperature-sensor/overview (accessed Feb. 21, 2021).