



An Arduino Based Assistant

Digital System Design Sessional

Group 5

Bangladesh University of Engineering
and Technology

October 25, 2017

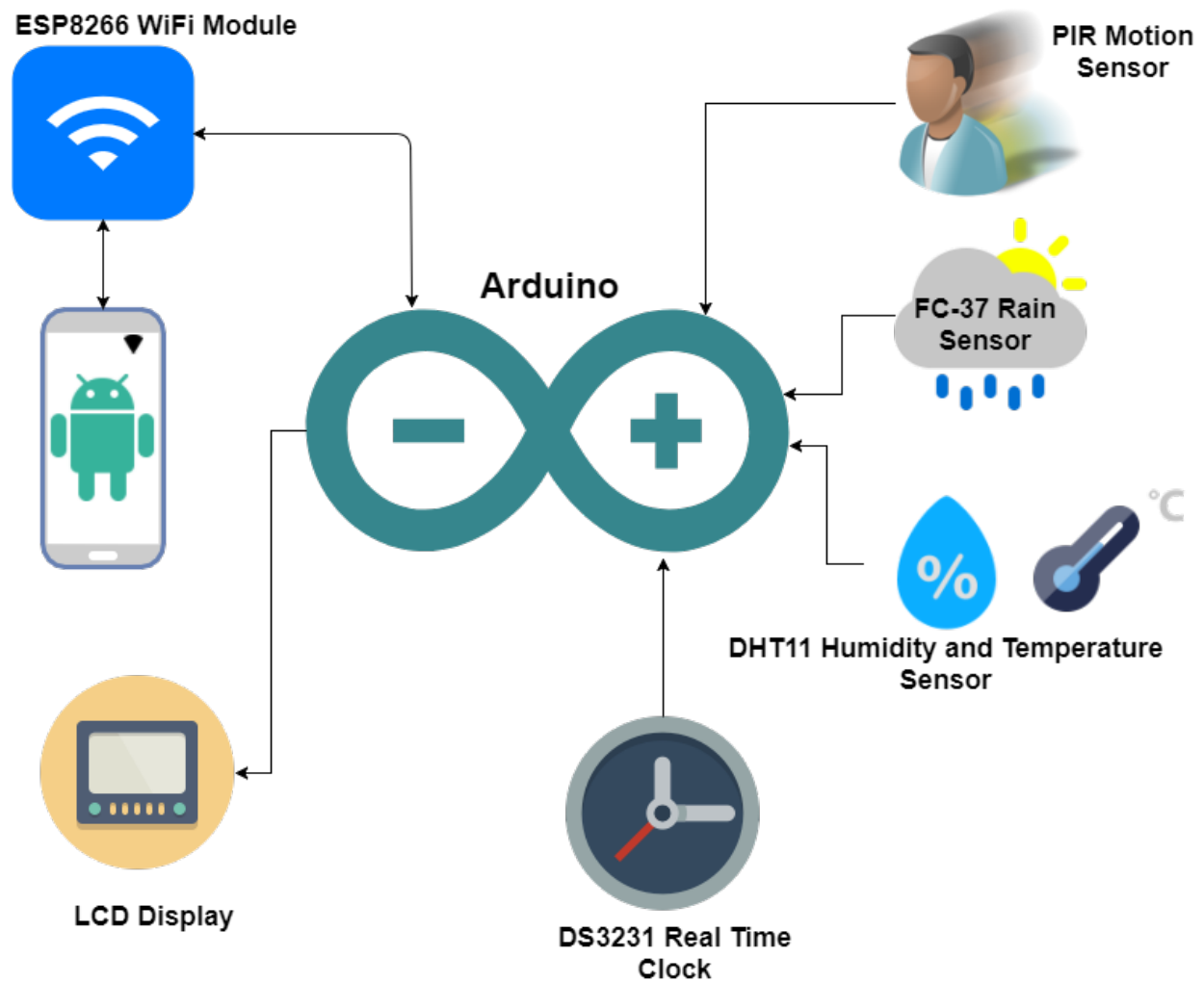


Fig : Block Diagram

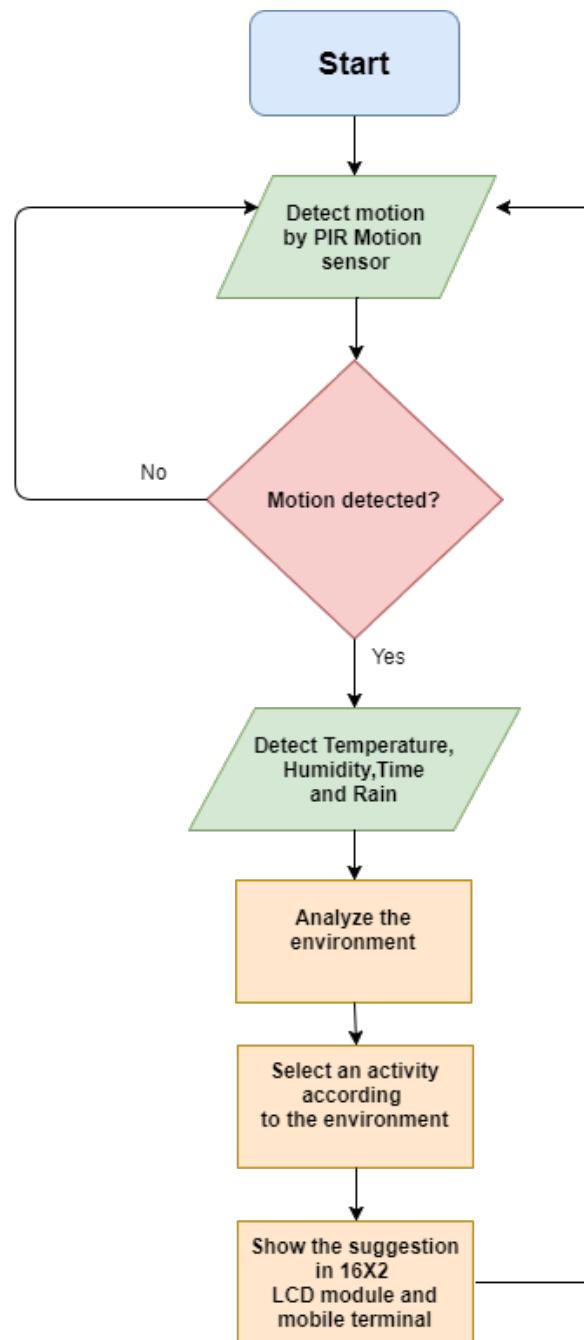


Fig : Flow chart

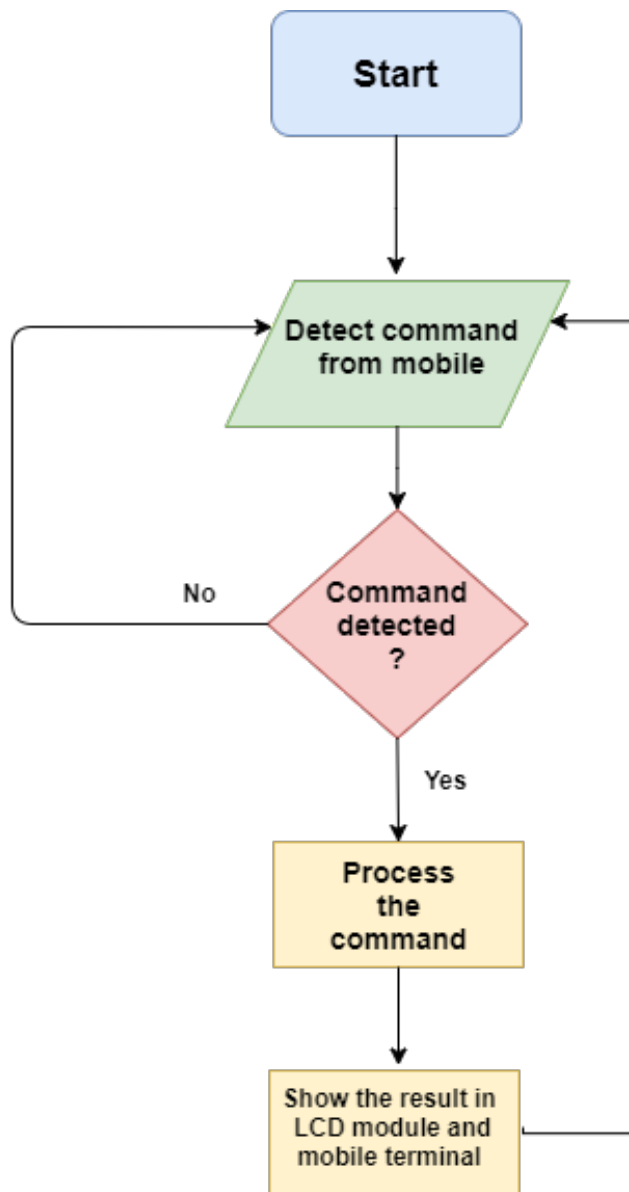


Figure : Flow Chart (Wireless Command)

Table 1: Month wise average maximum and minimum temperature in Dhaka, Bangladesh.

Month	Maximum temperature °C	Minimum temperature °C
January	24.52	13.84
February	29.69	15.76
March	34.74	22.52
April	36.43	24.27
May	37.48	26.42
June	36.37	27.33
July	33.81	26.48
August	33.52	26.23
September	33.60	26.10
October	32.90	23.42
November	29.60	19.17
December	25.32	13.81

Table 2: Month wise relative humidity in Dhaka, Bangladesh.

Month	Relative Humidity%
January	79.61
February	64.77
March	62.67
April	68.17
May	72.66
June	73.55
July	81.78
August	79.50
September	82.88
October	78.50
November	76.61
December	78.11

1 Arduino

Arduino is an open source computer hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, or as do-it-yourself kits.

Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment (IDE) based on the Processing language project.

2 Working Principle Of PIR Motion Sensor

The PIR Motion sensor itself has two slots in it, each slot is made of a special material that is sensitive to IR. The lens used here is not really doing much and so we see that the two slots can 'see' out past some distance (basically the sensitivity of the sensor). When the sensor is idle, both slots detect the same amount of IR, the ambient amount radiated from the room or walls or outdoors. When a warm body like a human or animal passes by, it first intercepts one half of the PIR sensor, which causes a positive differential change between the two halves. When the warm body leaves the sensing area, the reverse happens, whereby the sensor generates a negative differential change. These change pulses are what is detected.

3 Working Principle Of DHT11 Temperature and Humidity Sensor

These sensors consist of a humidity sensing component, a NTC temperature sensor (or thermistor) and an IC on the back side of the sensor. For measuring temperature and humidity they use the sensing component which has two electrodes with moisture holding substrate between them. So as the humidity changes, the conductivity of the substrate changes or the resistance between these electrodes changes. This change in resistance is measured and processed by the IC which makes it ready to be read by an arduino.

4 Working Principle Of FC37 Rain Sensor

The rain sensor module is an easy tool for rain detection. It can be used as a switch when raindrop falls through the raining board and also for measuring rainfall intensity. The module features, a rain board and the control board that is separate for more convenience, power indicator LED and an adjustable

sensitivity though a potentiometer. The analog output is used in detection of drops in the amount of rainfall. Connected to 5V power supply, the LED will turn on when induction board has no rain drop, and DO output is high. When dropping a little amount water, DO output is low, the switch indicator will turn on. After brushing off the water droplets, and restoring to the initial state, outputs will be high.

5 Working Principle of DS3231 Real Time Clock

The DS3231 is a low-cost, extremely accurate I^2C real-time clock (RTC) with an integrated temperature-compensated crystal oscillator (TCXO) and crystal. The device incorporates a battery input, and maintains accurate timekeeping when main power to the device is interrupted. The integration of the crystal resonator enhances the long-term accuracy of the device as well as reduces the piece-part count in a manufacturing line. The DS3231 is available in commercial and industrial temperature ranges, and is offered in a 16-pin, 300-mil SO package.

The RTC maintains seconds, minutes, hours, day, date, month, and year information. The date at the end of the month is automatically adjusted for months with fewer than 31 days, including corrections for leap year. The clock operates in either the 24-hour or 12-hour format with an active-low AM/PM indicator. Two programmable time-of-day alarms and a programmable square-wave output are provided. Address and data are transferred serially through an I^2C bidirectional bus.

6 Working Principle of ESP8266 WiFi Module

ESP8266 is an UART-WiFi transparent transmission module with ultralow power consumption, specially designed for the needs of a new connected world. It offers a complete and self-contained Wi-Fi networking solution, allowing it to either host the application or to offload all Wi-Fi networking functions from another application processor. ESP8266 has powerful on-board processing and storage capabilities that allow it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, and the entire solution, including front-end module, is designed to occupy minimal PCB area. ESP8266 Serial Wifi Wireless Transceiver Module is suitable for Uno, Mega 2560 and Nano.