This project was carried out by me (Mohammad Shaaban) at Imam Khomeini International University, Faculty of Technical and Engineering, Digital Lab, and by the aid of engineer Mr. Hassan Suleiman Alamooti.

This project communicate ESP8266 module with android device to display power consumption by the particular appliance connected with a measuring circuit.

In this circuit ESP8266 DevKit role is to measure power consumption (using ACS712 current sensor), and on demand ESP8266 wirelessly transmits the consumption value at a chosen moment within last one hour, in addition to the ability to turn a particular appliance on/off, wirelessly.

In android side user must insert username/password to enter the application, then turn on Wi-Fi to scan available Wi-Fi access points (available home appliances).

I have put ESP8266 in Wi-Fi mode 3 (both access point and station point). By providing suitable SSID1, PASSWORD1 of the local router, ESP8266 acts as a station point and automatically connects to the local router and send power consumption to cloud (Sparkfun, Thingspeak...).

Then by providing ESP8266's (SSID, PASSWORD), ESP8266 works as access point itself (concurrently with being station point), and give Wi-Fi devices (android mobile for example) the ability to connect with it in WPA2 encryption configure.

Again in android side when user scans available Wi-Fi access points, we limit search results to our ESP8266s, using its MAC address.

When user enters a particular plug (ESP8266), he/she initializes http connections, then when user:

- Presses "turn plug on/off" buttons, or

- Insert the desired moment between (1--> 60 minute) and presses "show" button an http get request is initialized and proper response is shown on screen.

In addition to this user can use android device internet to access cloud and see a particular plug consumption, this is done by "Go" button.