

Bluetooth-Enabled Android Control for Industrial Automation

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Abstract

The paper presents the home appliances like a lightweight, TV and Fan control with the assistance of Wireless micro controller through Android mobile. It is possible by using cell technology which is useful to our society. The goal of this project is to help the physically challenged and elderly people. Automated processes provide comfort for operator and increase productivity. The risk involved is also decreased. With the development of remote systems, it is possible to access and control the strategy, system or interface from a computer, mobile android devices with a user friendly interface. The mobile electronics and control concepts are required to develop a strategy. In the recent times, cell phones have become very powerful with better efficiency and improved characteristics. This project helps to develop device control for industrial automation.

Keywords

Android, Bluetooth, device control, industrial automation

I Introduction

The objective of using Arduino for Wireless Device Control with Bluetooth is to enhance the working capabilities of the devices that are under control. The planning is an eco-friendly one[1]. This method saves space for recycling. Storage is a major problem and takes lot of space. The transportation cost is very high. Aluminium is used to make beverage cans. These aluminium modules are often recycled into similar products with better quality, efficiency and reliability. The need for Wireless technology is ever increasing and hardware is practically feasible.

II Proposed System

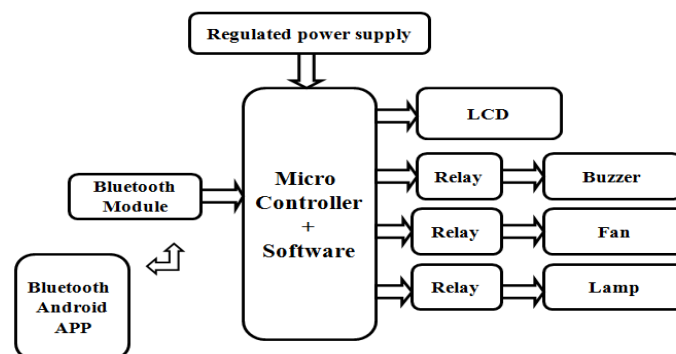


Fig 1: Schematic diagram

The primary motive of this project is to build up a system that helps elderly and Industrial devices.

The objective of this project is to take into consideration all the domestic systems that are difficult to control by elderly people and the handicapped.

The project will allow any person who has a Bluetooth enabled Android mobile phone to get an application from the Google Play Store.

With the help of this application, user can control all the appliances in the house via Bluetooth receivers [2].

The proposed system allows the clients to have access to all the appliances in the house including air conditioners, and lights, with a single click on a mobile phone to turn it either ON or OFF.

The most important consideration in the application is that it has to be user friendly and simple to operate. By opening the application, the user can also check the status of the appliances to see whether they are ON or OFF.

To develop a user friendly application and fulfill all the objectives of this project, the GUI of the application has to be the foremost priority.

The interface of the application will prove how easy the application is to use as well as give flexibility to the user.

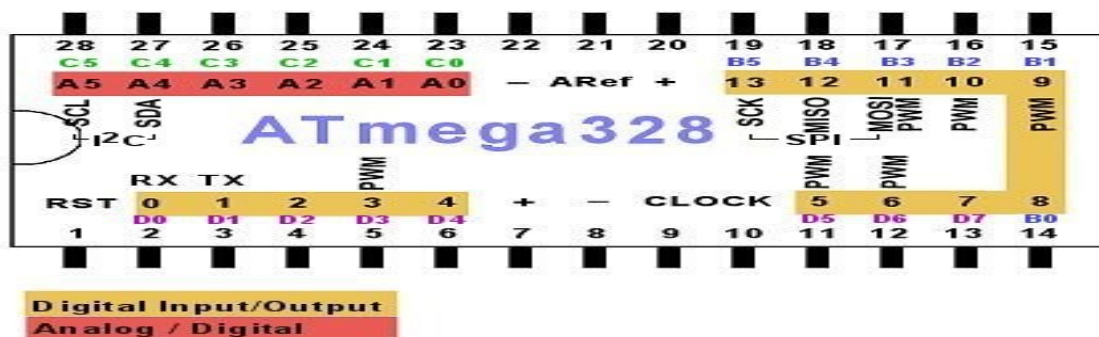
The following list of objectives must be fulfilled to successfully help elderly and disabled individuals.

1. Develop Bluetooth appliance controller: The Bluetooth will interface with the microcontroller to perform the desired automation. The microcontroller will get the signals from the Bluetooth enabled mobile phone and it will be processed.
2. Develop an application for a mobile phone: An application needs to be developed for the mobile phone, which needs to communicate with the Bluetooth receiver HC 06.
3. Integrate the device to the controller: The foremost priority that has to be kept in mind when developing a Smart Home is that it has to be cost-efficient. The appliance controller has to be inexpensively integrated with the appliances in the house with an easy installation.
4. Test the set up and analyze the data: After the system is set-up, with the help of a mobile device and a controller, tests are conducted while data is recorded and analyzed.

III Hardware

The hardware components are shown below.

Pin diagram:



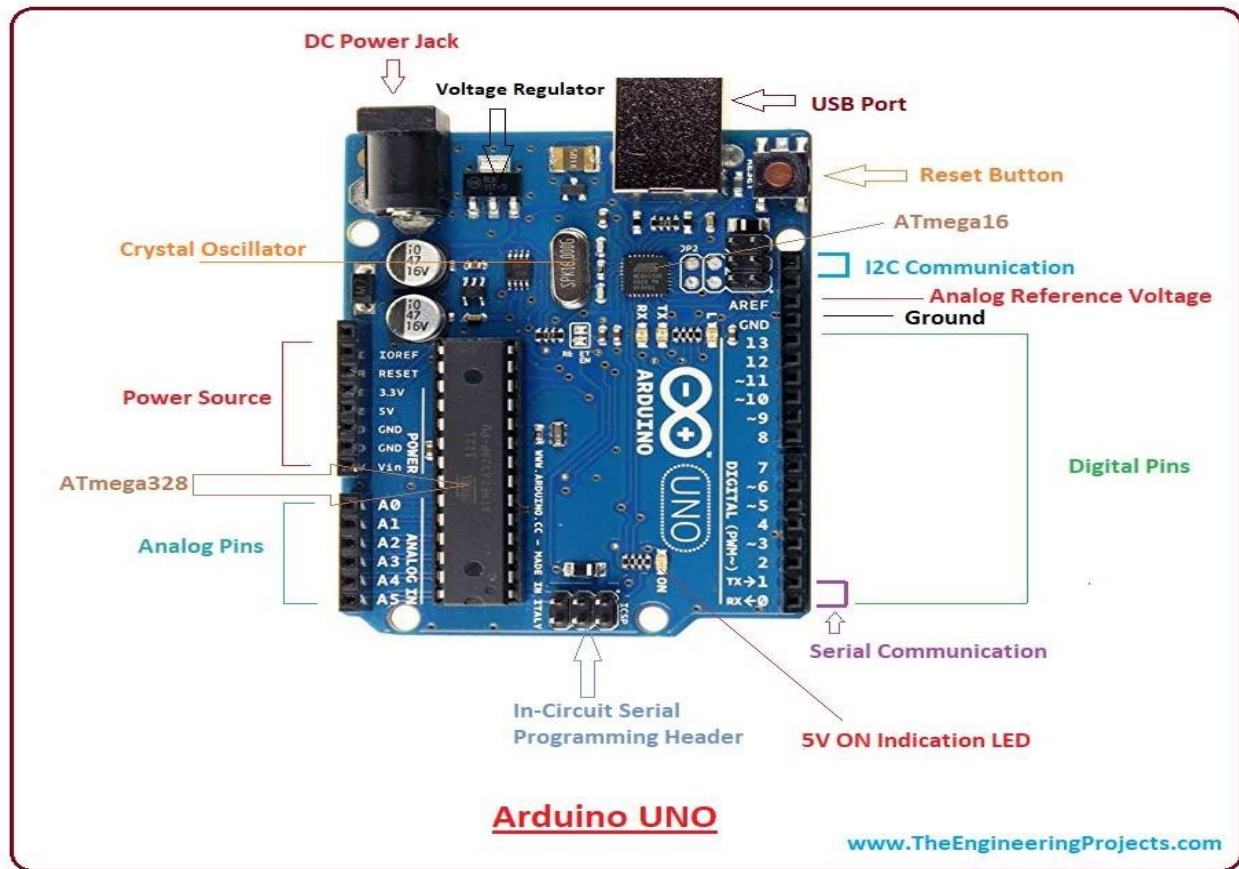


Fig 2: PIN DIAGRAM OF ATMEGA328

IV Software Components

The software consists of a toolbar which is used interfacing. The toolbar is shown in Fig 3.

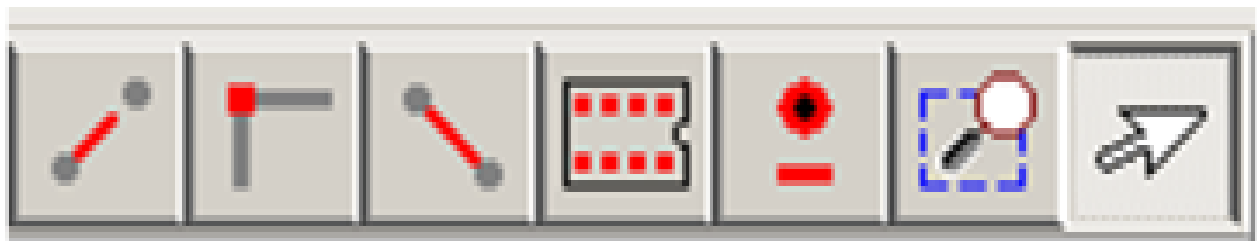


Fig 3: Toolbar for interfacing

The working of the software is shown in the example given below.

Example:

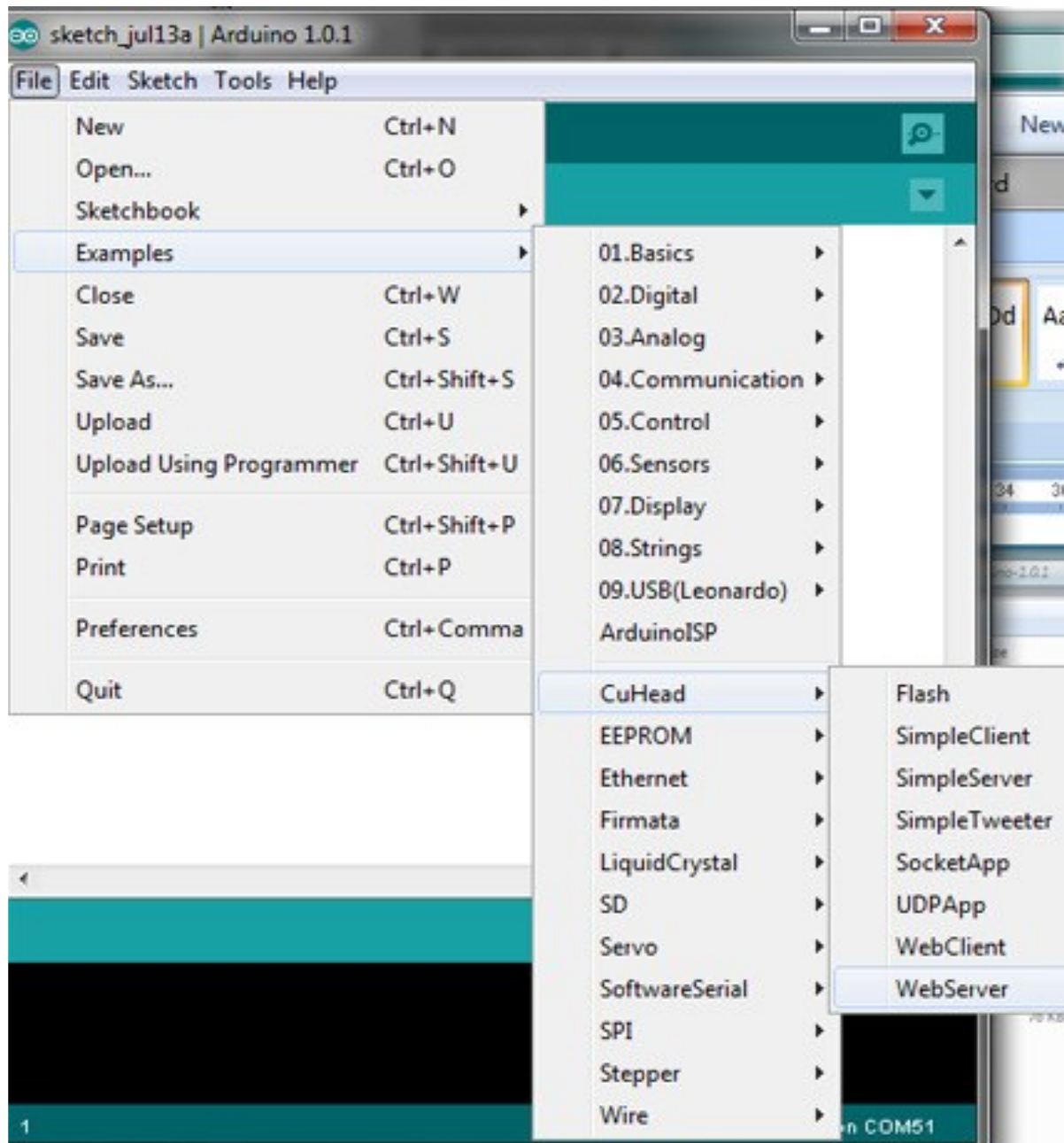


Fig 4: Compile

Choose the target board “Arduino Uno”:

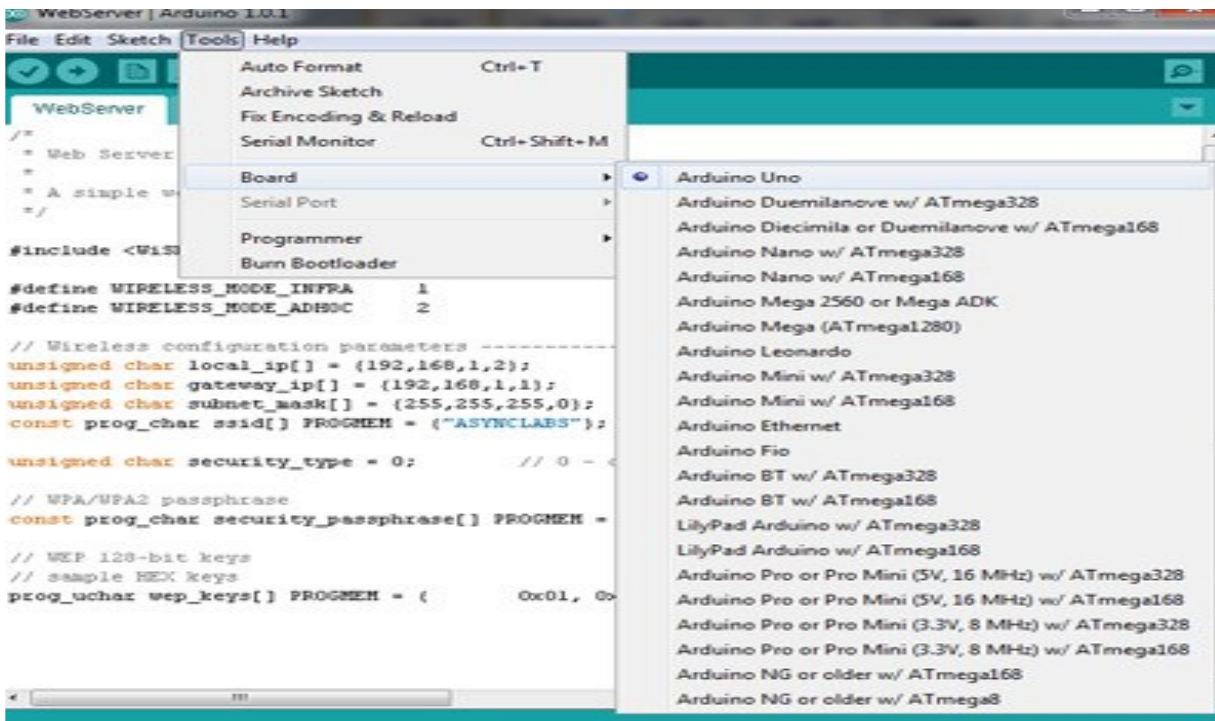


Fig 5: Target Board

Choose Sketch-> Verify/Compile:

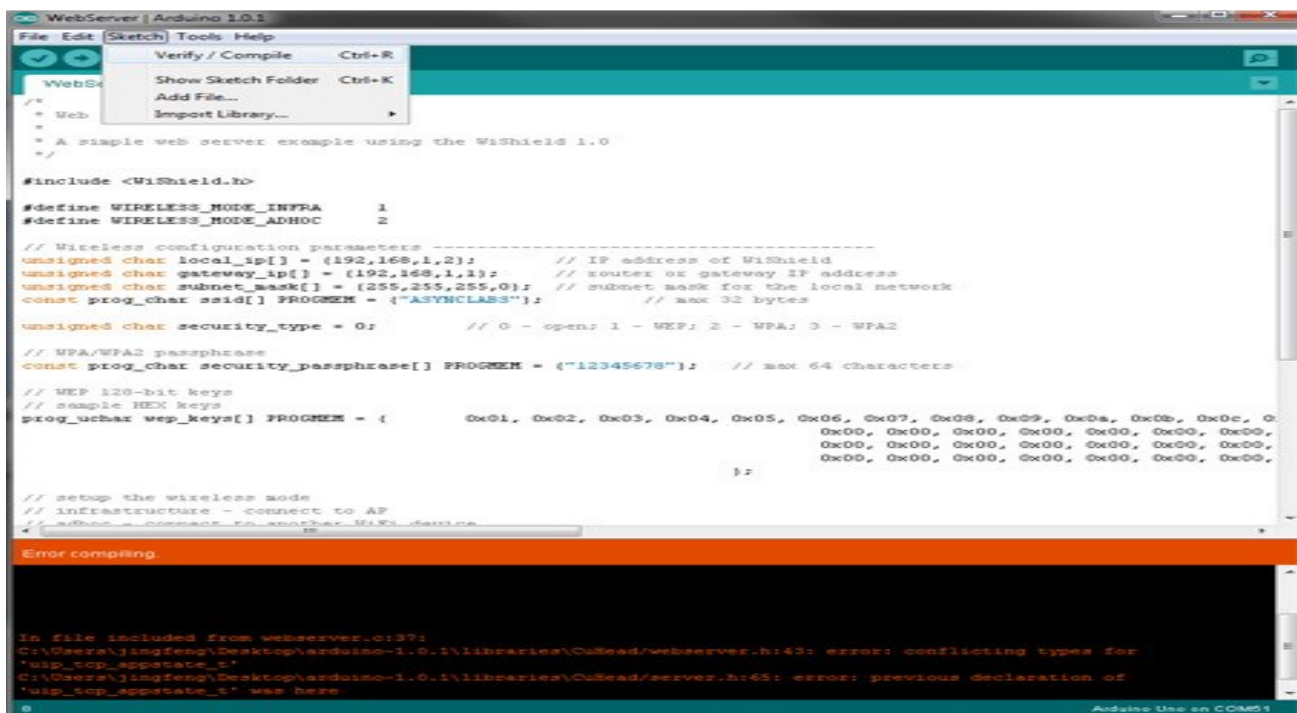


Fig 6: Verify/Compile

V. Project Analysis

Arduino BT, 8-bit microcontroller board with BlueGiga WT11 Bluetooth component is employed. This module provides necessary features for wireless serial communication over Bluetooth [6]. This board has I/O ports, A/D converter, PWM and other additional resources which make it useful for the desired work.

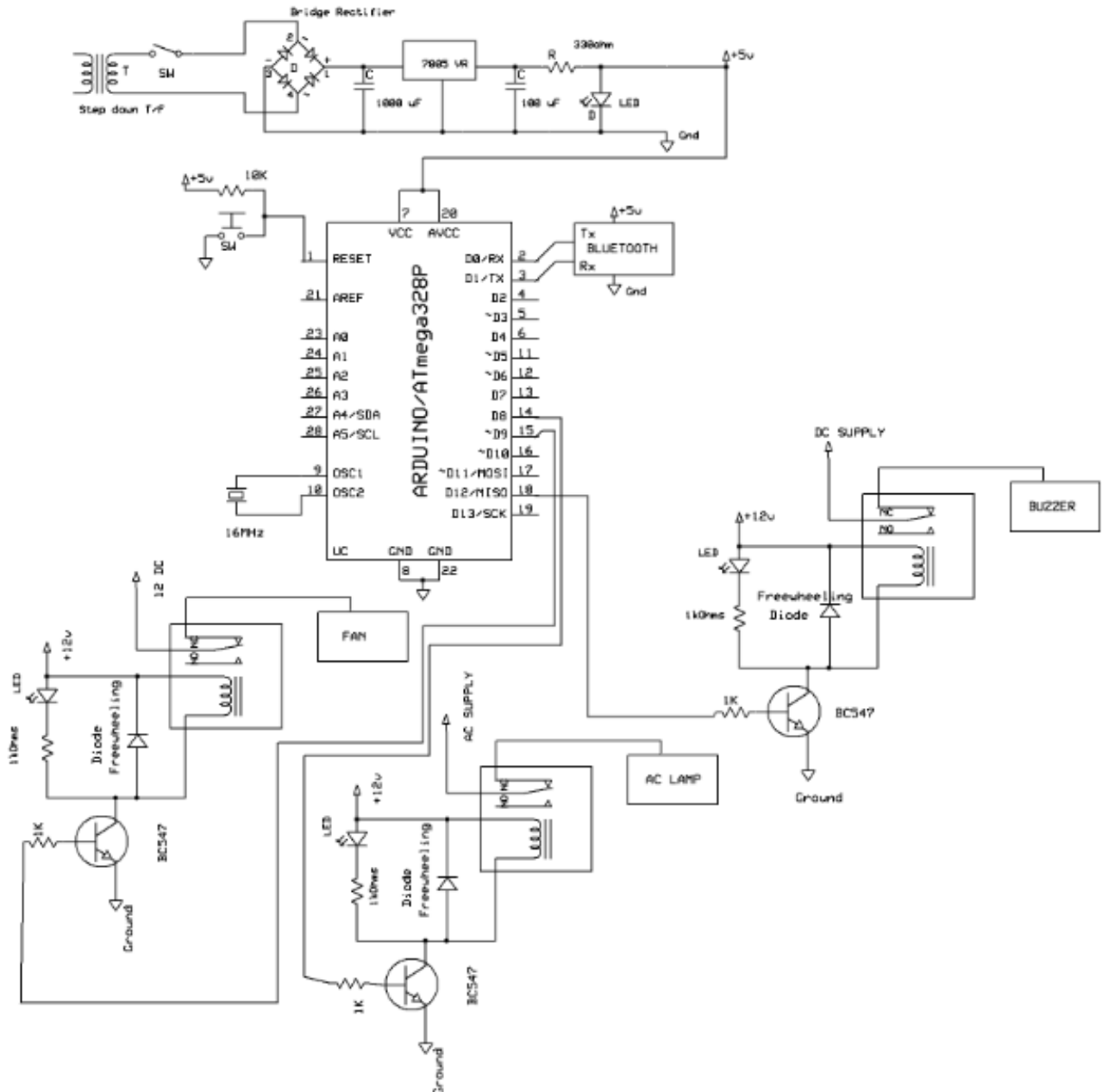


Fig 7: Experimental setup

For testing purpose, 25W, 240V lamps are used. In case if there is a malfunction, the device indicates that execution was not carried out successfully.

VI. Conclusion

The system was designed in such a way that any electrical home appliance can be operated through webpage. The controlling of electrical appliances is done through Wi-Fi. Hence, “Bluetooth Based device Automation” integrates features of all the hardware components used. Advanced micro controller is employed in it. Multiple electronic devices are controlled and standing of these devices may be monitored through Bluetooth. The Arduino microcontroller has been programmed to manage a variety of home automation devices on direct commands by the user. The system has been programmed to own Bluetooth communication capability. Demonstrations of the system show that it facilitates the control of home-based devices.

References

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