CHAPTER – 4

METHODOLOGY

4.1 Methodology
4.2 Required Components
4.3 Platforms

4.1. __METHODOLOGY__

- ➢ We have used the Arduino microcontroller which is used to control the all IOT devices and it is an open source IOT platform and worldwide used for various purpose. We need to program this microcontroller. To program Arduino microcontroller we used Arduino IDE.

- ➢ The version of Wi-Fi Module used is ESP-8266 Wi-Fi module and we need to interface it with our Arduino microcontroller for connecting our devices to internet. The another components that required are Ultrasonic Sensor, LDR sensor, Water level measure sensor, LED, IR sensors, LCD Display, Relay Module, Temperature and Humidity for performing various task.

- ➢ We have connect our microcontroller with database for sending or receiving the data to or from firebase real-time database using ESP-8266 WIFI Module(NodeMCU).

- ➢ We supply 5V power to Microcontroller. Sensors send the signal (Analog and Digital) to microcontroller and then Using ESP-8266 Wi-Fi Module microcontroller send data to database and depend upon the value of database the action will be performed like send notification to Dumping Station, turn on Street Lights, Supply Water to water tanks and allowing to park vehicle or not etc.

4.2. <u>Required Components:-</u>
- Arduino Microcontroller
- NodeMCU Microcontroller
- ESP 8266 Module
- Ultrasonic Sensor
- LDR sensor
- Water level measure sensor
- LEDs
- IR sensors
- LCD Display
- Relay Module

4.3. <u>Platfroms:-</u>
- Arduino IDE
- Tinkercad
- MIT App Inventor
- Blynk Cloud
- Google FireBase Database