CHAPTER 4
ANALYSIS AND DESIGN

4.1 Analysis

The microcontroller that used in this project is Arduino UNO. This project uses several device, there are a Arduino, Ethernet shield, soil moisture sensor, humidity and temperature sensor, servo, LCD, water flow sensor, aquarium liquid filter, relay. Then, the soil moisture sensor is used to Measure soil moisture and as a determinant for watering. If the soil moisture sensor detects the ground in a dry state, the Relay will be HIGH status and make the water pump get electric voltage and will pump water from the water container, and the servo will rotate so that the hole in the pipe is facing down.
4.2 Design

4.2.1 Flowchart

Illustration 4.1: Flowchart

Arduino's first program is to request the IP of the router. When the arduino has obtained the IP, then the arduino will display the IP obtained
from the router and token provided by Cayenne IoT. Arduino's first program is to request the IP of the router. When the arduino has obtained the IP, then the arduino will display the IP obtained from the router and token provided by Cayenne IoT. After that, Arduino will check whether Arduino gets input from the Cayenne or not. If Cayenne does not give input then the arduino will check the ground is moist or not. If the ground is moist the arduino will give the servo command to rotate 180° and turn on the relay for a few seconds for water to be used for watering too much. After completion of the watering, the relay will turn off and the servo will rotate 90°. Then Arduino will check again whether there is input from IoT server or not. When the IoT server send command for watering, the arduino will turn on the relay and the servo will rotate 180°, even though the sensor reads that the ground is wet.
4.2.2 Design Schematic

The Arduino used 9 pins for this project. That is:

- PIN DIGITAL 2 – Pin for water flow sensor (data).
- PIN DIGITAL 4 – Pin for servo(PWM).
- PIN DIGITAL 5 – Pin for Relay (IN)
- ANALOG 0 – Pin for soil moisture sensor.
- ANALOG 1 – Pin for soil moisture sensor.
- ANALOG 4 – Pin for LCD (SDA).
- ANALOG 5 – Pin for LCD (SCL).
- VCC (5V) - Breadboard (+)
- GND – Breadboard (-).