



## **PROJECT REPORT**

**Department of Computing and Technology**

**Mini Project**

**Smart Garden**

**Submitted to:**

**Ms. Maria Hanif**

**Group Members**

**M Shaharyar**

**M Kabeer Khan**

**Israr Hussain**

**Farooq Sarwar**

**M Shaharyar Shabbir Bhatti**

## **ABSTRACT**

The Smart Garden System is a networked garden automation system that utilizes various sensors and devices to monitor and control the environment and plant growth. The system is designed to optimize plant growth, conserve water, and automate the garden's irrigation process.

The system comprises several components, including a water sensor that monitors the soil moisture level and sends a signal to the micro controller to activate the sprinkler system when the moisture level falls below a specified threshold. The motion sensor detects any movement within the garden area and sends a signal to the sprinkler to switch to turn it off.

Additionally, the system has a gate that can be remotely controlled to restrict access to the garden, ensuring security and privacy.

Overall, the Smart Garden System with Water Sensor, Sprinkler, Motion Sensor, and Gate offers a reliable, efficient, and convenient way to manage and maintain a garden. The system's scalability and flexibility make it suitable for small-scale and large-scale garden applications

## **OBJECTIVE**

The objective of a smart garden system is to improve the efficiency and sustainability of gardening practices. It achieves this by combining automation, data analysis, and customization to create a system that can monitor and respond to environmental factors in real-time.

The system aims to provide precise and efficient watering in better plant growth and resource management.

Additionally, the smart garden system aims to promote sustainable and environmentally friendly gardening practices by conserving water. Overall, the objective of the smart garden system is to revolutionize the way we garden and promote a more sustainable and efficient approach to growing plants.

Hence, the primary goal of this simulation is to ensure that the networked devices and sensors communicate effectively and efficiently with each other to achieve the desired results, such as optimal plant growth, resource conservation, and automated irrigation

## INTRODUCTION

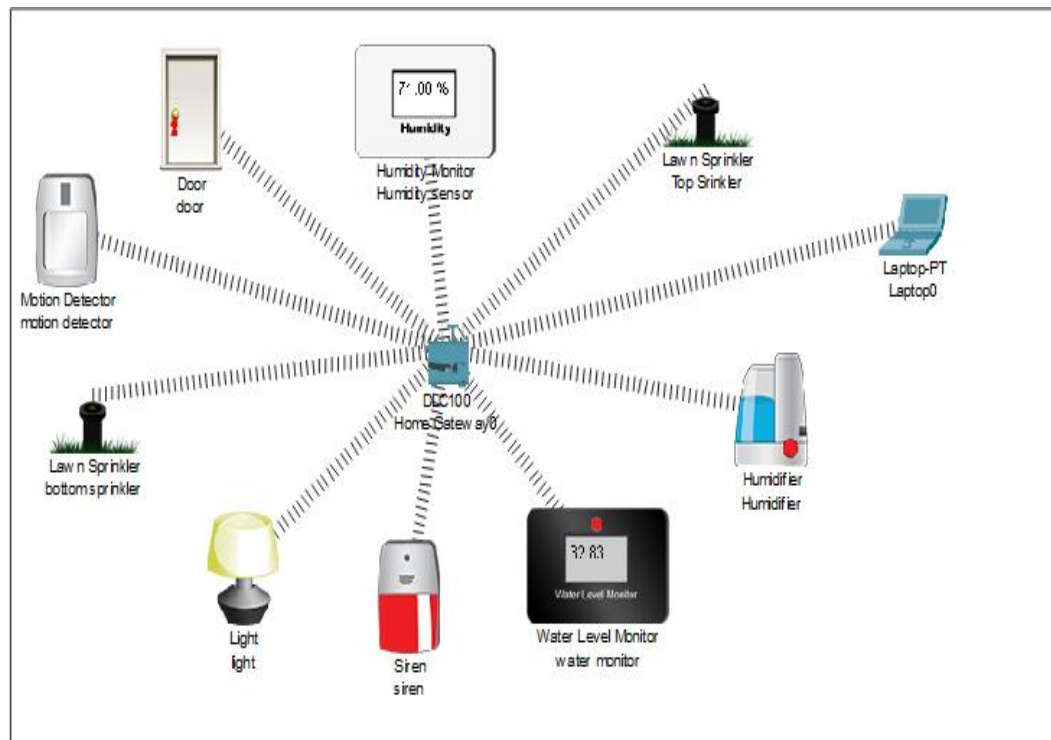
In recent years, the Internet of Things (IoT) has revolutionized many industries, including agriculture and gardening. A smart garden system with components such as a water level monitor, sprinkler, gate, and sensor is an example of an IoT-based project that can automate and optimize various functions related to garden maintenance, security, and environmental sustainability.

The system uses sensors and smart algorithms to monitor and control the environmental conditions of the garden, such as soil moisture, temperature and humidity. The water level monitor can detect when the soil is dry and trigger the sprinkler system to water the plants only when necessary, preventing over watering and waste of water. The gate can be controlled remotely, allowing the user to restrict access to the garden and enhance security.

The sensor can provide real-time data on various environmental parameters, allowing the user to adjust the system settings accordingly. The system is designed to be accessed and controlled remotely through an application making it easier and more convenient for the user to manage the garden.

Overall, a smart garden system is an excellent example of how IoT technology can be used to create a more efficient, sustainable, and enjoyable gardening experience for the user while promoting environmental consciousness and enhancing the security and productivity of the garden.

## MODULE:



## Components Required:

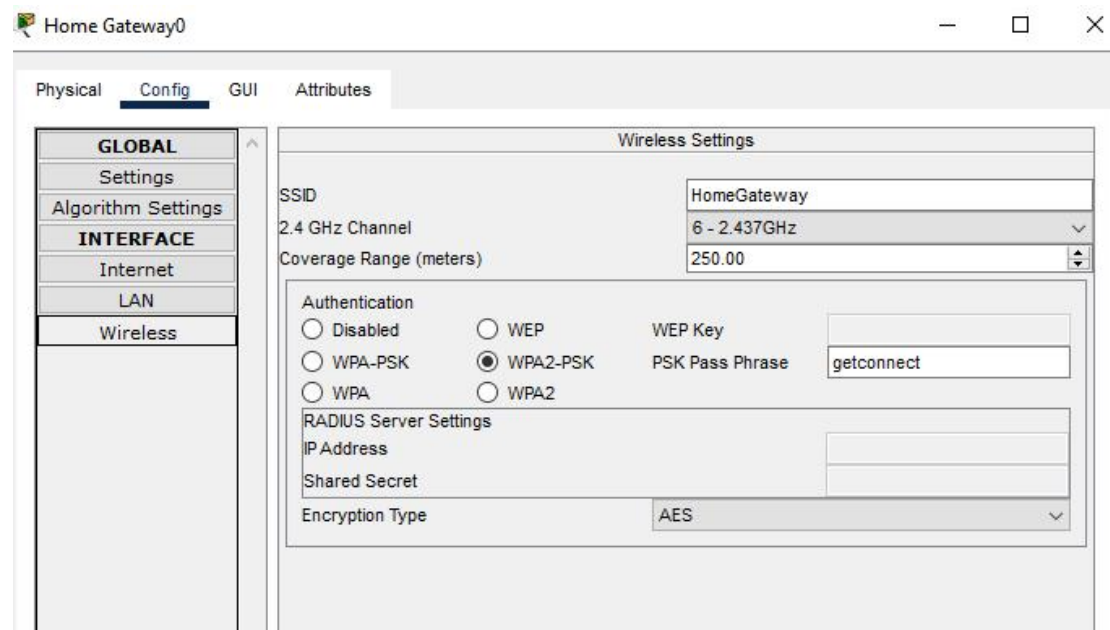
Device	Required Number
Sprinkler	2
Water Level Monitor	1
Motion detector	1
Siren	1
Door	1
Humidity Sensor	1
Humidifier	1
Home-gateway	1
Laptop	1
Light	1

## Procedure:

### Connectivity

Home gateway is connected to all the devices present in the system through wireless network connectivity. The IPv4 address is **192.168.25.1** and the subnet mask is **255.255.255.0** . The authentication for this is WPA2-PSK.

With the help of password '**get connect**' we will connect all the devices.

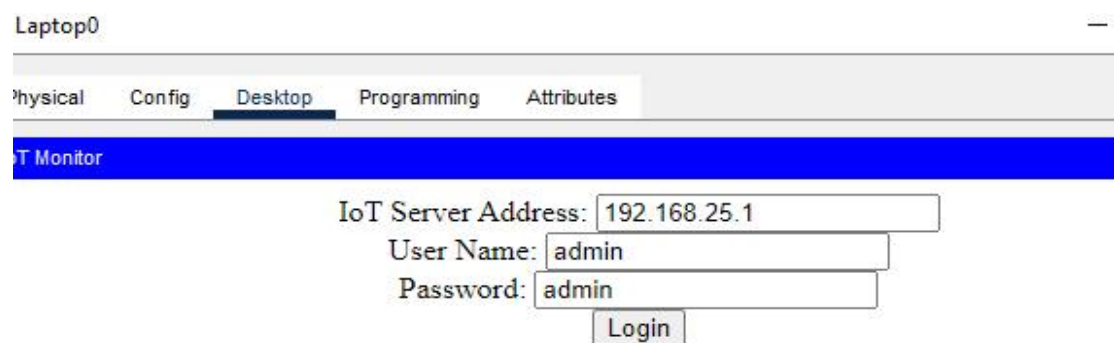


All the remaining devices are connected wirelessly with help of **PT-IOT-NM- 1W** network adapter. With the help of password 'get connect' we will connect the devices to the home gateway.

## Home Gateway

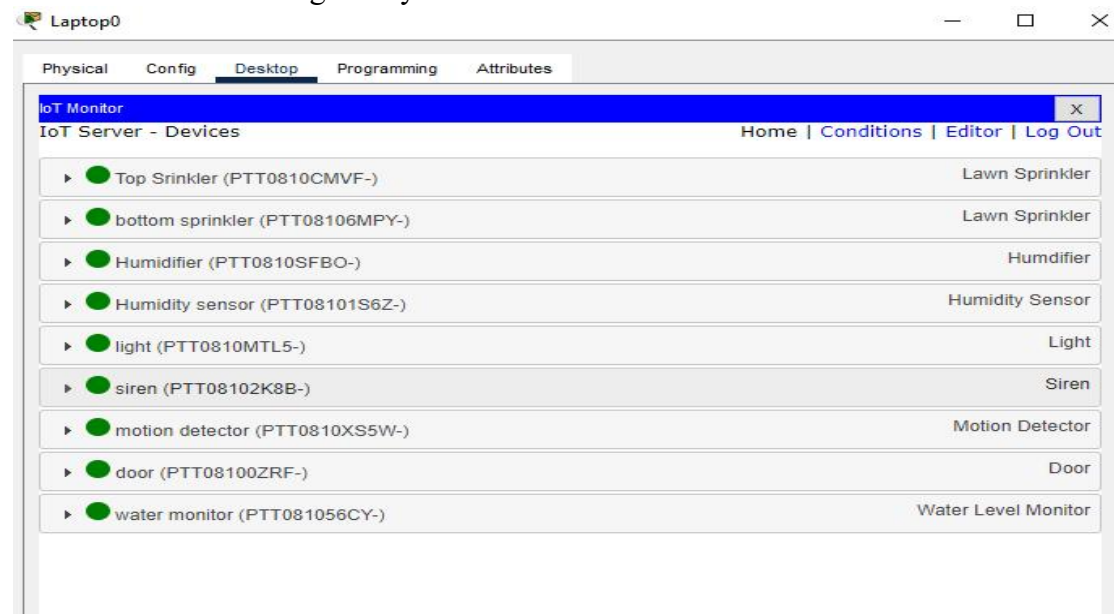
With the help of Laptop we will open the IOT monitor gateway . To open it we will go to the web browser and enter the IP address ( **192.168.25.1** ) in the URL.

**Now we will login using the Username ( admin ) and password ( admin ).**



The screenshot shows a web browser window titled "Laptop0" with tabs for Physical, Config, Desktop, Programming, and Attributes. The "Desktop" tab is active, displaying the "IoT Monitor" login page. The page has a blue header bar with the text "IoT Monitor". Below the header, there are three input fields: "IoT Server Address:" with the value "192.168.25.1", "User Name:" with the value "admin", and "Password:" with the value "admin". A "Login" button is located below the password field.

In the monitor gateway we will get the different types of devices that are connected to the home gateway.



The screenshot shows the IoT Monitor dashboard on a laptop screen. The dashboard has a blue header bar with the text "IoT Monitor" and a close button (X). Below the header, there is a navigation bar with links: Home | Conditions | Editor | Log Out. The main content area is titled "IoT Server - Devices" and displays a list of connected devices. Each device entry consists of a green status indicator, a device name, a device ID, and a device type. The devices listed are:

Device Name	Device ID	Device Type
Top Sprinkler	(PTT0810CMVF-)	Lawn Sprinkler
bottom sprinkler	(PTT08106MPY-)	Lawn Sprinkler
Humidifier	(PTT0810SFBO-)	Humidifier
Humidity sensor	(PTT08101S6Z-)	Humidity Sensor
light	(PTT0810MTL5-)	Light
siren	(PTT08102K8B-)	Siren
motion detector	(PTT0810XS5W-)	Motion Detector
door	(PTT08100ZRF-)	Door
water monitor	(PTT081056CY-)	Water Level Monitor

## Conditions

We will give certain conditions in the laptop for the operations.

### Water Level

If the water level is less than 5.0 cm then all the sprinklers will be on. If the water level present in the soil is more than 30 cm then all the sprinklers will be off. We can change the values according to the requirements of the plants.

### Humidity Level

If the humidity present in the atmosphere is more than 72% then the humidifiers are set to off. If the recorded values in the humidity sensor are less than 72% then the humidifiers are set to on. We can change the values according to the requirements of the plants.

### Smart Light

If the water level is less than 5.0 cm then the smart light is turned on. If the water level present in the soil is more than 5.0 cm then the smart light is turned off. And if water Level is more than 30.0 cm then smart light will be on.

### Motion Detector

The motion sensor detects any movement within the garden area and sends a signal to the sprinkler to switch to turn it off.

Laptop0

Physical

Config

Desktop

Programming

Attributes

IoT Monitor

IoT Server - Device Conditions

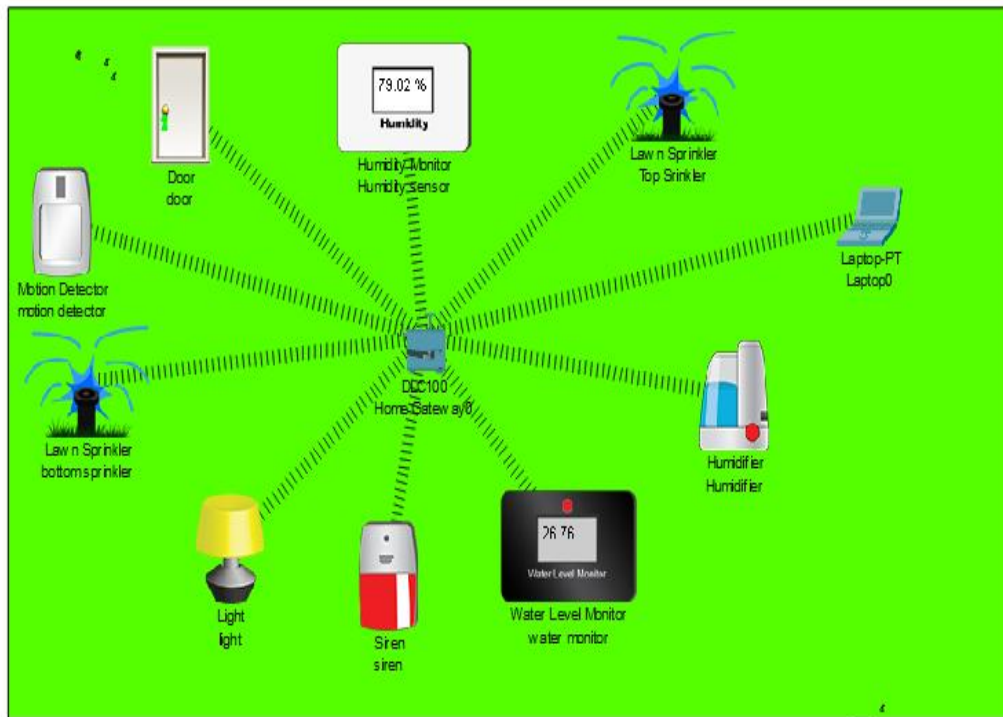
Home | Conditions | Editor | Log Out

Actions		Enabled	Name	Condition	Actions
Edit	Remove	Yes	sprinklers on	water monitor Water Level <= 5.0 cm	Set Top Sprinkler Status to true Set bottom sprinkler Status to true Set light Status to On
Edit	Remove	Yes	humidity sensor	Humidity sensor Humidity <= 72 %	Set Humidifier Status to true
Edit	Remove	Yes	sprinkler 1	water monitor Water Level is between 10.0 cm and 30.0 cm	Set Top Sprinkler Status to true Set bottom sprinkler Status to true Set light Status to Off Set siren On to true
Edit	Remove	Yes	light1	water monitor Water Level >= 30.0 cm	Set bottom sprinkler Status to false Set Top Sprinkler Status to false Set light Status to On
Edit	Remove	Yes	motion	motion detector On is true	Set Top Sprinkler Status to false Set bottom sprinkler Status to false Set siren On to true Set door Lock to Lock

Add



## Implementation:



## Results:

The Results of the smart Garden system is shown using CISCO packet tracer. The project is done according to the requirement. All the devices are monitored through smartphones. The sprinklers are turned on when the water level present in the soil is less than 5.0 cm, and turned off when the water level is more than 5.0 cm . Similarly the humidity monitor is turned on when the humidity present in the atmospheres is less than 72% and turned off when the humidity present in the atmosphere is more than 72%

Final network,

The values present in the water level monitor are more that 5.0 cm so the sprinklers are off, smart light is off. The humidity monitor records 79.02% ,and water monitor records water level which is 26.76 cm,since the humidity is more than the mentioned conditions i.e 72% the humidifier is off.