**‘An IoT based smart indoor vertical farming’**

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# 1. Requirements

## 1.1 High level Requirements:

* Need to send alert notifications to the user when the tank is empty and the action to be taken by the user based on the alerts received.
* Provides the sensor data to the user through their mobile applications.
* Monitor and control the sensor readings and their thresholds for sending alerts.
* Determining whether there is darkness near the plants.
* Need to send alert messages to user when there is less amount of light to take necessary action.

## 1.2 Low level Requirements:

* Arduino Uno
* Sensors: DHT11, LDR sensor, soil moisture sensor, Ultrasonic sensor, Float sensor
* Arduino IDE software
* Bluetooth module HC-05
* Micro SD card adapter
* Racks for vertical farming
* Plants like Methi, Spinach, Coriander, Marigold

# 2. Design

## 2.1 Structural UML diagrams**:**

Storing and display output and alerts

Monitoring Phase

Arduino UNO

Power supply

Temperature and humidity sensor

Moisture sensor

LED Lights

Water supply

Float sensor

Speakers

pH sensor

HC-05 module

Action taken by user

**Fig 1. Block diagram for the system**

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**Fig 2. Flow Chart for the system**

## 2.2 Behavioral UML diagrams**:**

**Fig 3. Use Case diagram for taking action by the user**

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**Fig 4. Use Case diagram for Complete Model**

# 3. Test Plan

## 3.1 Test cases

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Id** | **Description** | **Expected input** | **Expected output** | **Actual Output** |
| **TC1** | **Alert sent to the user for empty tank** | **Float sensor value** | **Determines whether tank is empty or not** | **Pass** |
| **TC2** | **Alert for darkness near the plants** | **LDR sensor value** | **Determines darkness** | **Pass** |
| **TC3** | **Readings of soil moisture sensor** | **Soil moisture sensor values** | **Displays on the user’s mobile phone** | **Pass** |
| **TC4** | **Readings of LDR sensor** | **Values of LDR sensor** | **Displays the values to the user** | **Pass** |
| **TC5** | **Alerts on Sound level for the growth of plants** | **Values of sound sensor** | **Determines sound/music frequency** | **Pass** |

# 4. Implementation

## 4.1 GIT

## 4.2 Make

## 4.3 Build

## 4.4 Code Quality