Tank

GreenHouse

Activate Pump Activate Irrigation

Water capacity Moisture Content

0

ColdRoom

CowSpray

Smart Farm System

Temperature Cow detection

Activate AC Activate Spray

Update Bot Status Control Components

Farmer

FeedBot

Activate Bot Monitor Readings

1

Temperature Sensors

9

ActivitiesLogs

Control FeedBot

Upload Data

2

5

Control Cow Spray

Farmer

CowSpray

Store

Control AC

Cow Sensors

6

4

3

Control Drip Pump

Upload Data

Tank

Control Tank Pump

7

Upload Data

Water level Sensors

Greenhouse

Moisture Sensors

8

Upload Data

1.

Action

NO

FeedRotStatus

Start Feeding Cows

2

Action

NO

IsCowDetected & CowSprayStatus

Start Spraying Cow

3

Action

NO

IsMoistureReduced & DripPumpStatus

Start irrigating plants

4

Action

NO

IsWaterLevelReduced & TankPumpStatus

Pump water to tank

5.

Action

NO

IsTempHigh & IsACStatus

Regulate Temperature

6.

IsCowDetected

Cow Count ++

NO

Upload Cow Detection & count

7.

Tank height

Take Height Compute volume and upload Volume

8.

Moisture Reading

Upload Moisture Contents

9.

Temperature Reading & humidity

Upload Room temperature & humidity

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | **ActivitiesLog** | | | | id | PK | Integer | | tankPump |  | Varchar (20) | | DripPump |  | Varchar (20) | | ac |  | Varchar (20) | | spray |  | Varchar (20) | | numberOfCows |  | Varchar (20) | | FeedBot |  | Varchar (20) | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | **Spray** | | | | id | PK | Integer | | CowSprayStatus |  | Varchar (20) | |

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| |  |  |  | | --- | --- | --- | | **Store** | | | | id | PK | Integer | | Temperature |  | Varchar (10) | | humidity |  | Varchar (10) | | StoreFanStatus |  | Varchar (5) | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | **GreenHouse** | | | | id | PK | integer | | SoilMoisture |  | Varchar (10) | | DripPump |  |  | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | **Tank** | | | | id | PK | integer | | waterLevel |  | Varchar (10) | | tankStatus |  | Varchar (5) | |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| FEED | NO/OFF | DEACTIVE /ACTIVATE |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| TANK PUMP | NO/OFF | DEACTIVE /ACTIVATE |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| DRIP PUMP | NO/OFF | DEACTIVE /ACTIVATE |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| AIR CONDITION | NO/OFF | DEACTIVE /ACTIVATE |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| SPRAY SYSTEM | NO/OFF | DEACTIVE /ACTIVATE |

|  |  |  |
| --- | --- | --- |
| Client / User Interface | Application Server | Database Server |
| Toggle Button | Failed  Button Status  “ON / OFF “  Farm Settings | Success  Update device Status |

FeedBot

1

Temperature Sensors

Feed Status

FeedBot

9

Upload Data

2

5

Control Cow Spray

Farmer

CowSpray

Store

Control AC

Cow Sensors

6

4

3

Control Drip Pump

Upload Data

Tank

Control Tank Pump

7

Upload Data

Water level Sensors

Greenhouse

Moisture Sensors

8

Upload Data

Level 1

1.1

FeedBot

ColdRoom

Feed Status

D5 FeedBot

1.6

Upload Data

1.2

Control Cow Spray

Farmer

D3 Store

D2 CowSpray

D1 Tank

1.5

CowSpray

1.3

Upload Data

Upload Data

Tank

D4 Greenhouse

GreenHouse

1.4

Upload Data

Level 2

1.1

Feed Status

FeedBot

ColdRoom

1.1.1

Control FeedBot

D5 FeedBot

1.6

Upload Data

1.2

1.6.1

Control Cow Spray

Farmer

D2 CowSpray

D3 Store

Control AC

CowSpray

1.3

1.5.1

1.4.1

Control Drip Pump

Upload Data

D1 Tank

Control Tank Pump

1.5

Upload Data

Tank

D4 Greenhouse

GreenHouse

1.4

Upload Data

Level 3

ColdRoom

1.1

FeedBot

Feed Status

1.6

Upload Data

1.1.1

Control FeedBot

D5 FeedBot

D3 Store

1.2

Farmer

D2 CowSpray

1.6.1

Control Cow Spray

Control AC

1.3

Upload Data

CowSpray

1.5.1

1.4.1

Control Drip Pump

D1 Tank

Control Tank Pump

1.5

Upload Data

Tank

D4 Greenhouse

GreenHouse

1.4

Upload Data

1.6.2

Update Module Status

D5 ActivitiesLog



Upload Moisture Contents

**GreenHouse**

Upload Temperature value

**ColdRoom**

Control Components Status



Measure tank Depth

**Farmer**

**Tank**

Check Components Status



Detect Cow Presence

**CowSpray**

Update FeedBot Status



**FeedBot**

|  |
| --- |
| greenHouse |
| SoilMoisture  DripPumpStatus |
| CalculateMoistureContent ()  ActivateDripPump () |

|  |
| --- |
| ColdRoom |
| Temperature  Humidity  AirContionStatus |
| CalculateTemperature ()  ComputeHumidity ()  ActivateAirCondition () |



|  |
| --- |
| ActilitiesLog |
| TankPump  DripPump  AirCondition  NumberOfCows  FeedBot |
| ComponentStatus ()  CowSprayedCows () |

|  |
| --- |
| FeedBot |
| BotArmStatus |
| ActivateFeedMode () |



|  |
| --- |
| Tank |
| WaterLevel  TankPumpStatus |
| CalculateWaterVolume ()  ActivateTankPump () |



|  |
| --- |
| CowSpray |
| CowDetection  cowSprayStatus |
| DetectCow ()  ActivateSprayPump () |

Tank

ColdRoom

Control

Control

FeedBot

Farm

CowSpray

GreenHouse

|  |  |
| --- | --- |
| Collecting Resource | |
| Start: 1 | ID: 1 |
| Finish: 7 | Dur: 10 |

|  |  |
| --- | --- |
| Integrate Hardware & Software | |
| Start: 8 | ID: 2 |
| Finish: 30 | Dur: 120 |

|  |  |
| --- | --- |
| Develop Mobile Application | |
| Start: 45 | ID: 4 |
| Finish:60 | Dur: 45 |

|  |  |
| --- | --- |
| Develop Server | |
| Start: 34 | ID:3 |
| Finish: 44 | Dur: 20 |

|  |  |
| --- | --- |
| Establish Communication | |
| Start: 60 | ID: 5 |
| Finish: 65 | Dur: 5 |

|  |  |
| --- | --- |
| Documentation | |
| Start: 65 | ID: 6 |
| Finish: 70 | Dur: 15 |