

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation

5.1.1 Arduino IDE

The project use the Arduino IDE application. This application USES a compile and uploading program. Programs from arduino ideas like the one below:

```
1. #include "DHT.h"
2. #include <SPI.h>
3. #include <Ethernet.h>
4. byte mac[] = { 0xDE, 0xAD, 0xBE, 0xEF, 0xFE, 0xED }
```

Row 1 is the program library for DHT11. The second line serves as library for interpreting serials (the peripheral interface) in Arduino. The third line is the library for the Ethernet shield program. The fourth row is used to set up MAC address for ethernetshield.

```
1. #define DHTPIN1 2
2. #define DHTTYPE1 DHT11
3. DHT dht1(DHTPIN1,DHTTYPE1);
4. float humidityData1;
5. float temperatureData1;
6. int sensor1 = A0;
7. int output_value1;
8. int map_value1;
```

Rows 1-3 are used to define variables and pins for DHT11. Rows 4-5 used to declare variables for temperature and room 1. Row six to declare variables for soil detection sensors and pins for sensors. Line to 7-8 to declare variables for data obtained from soil detection sensors room 1.

```

1. #define DHTPIN2 3
2. #define DHTTYPE2 DHT11
3. DHT dht2(DHTPIN2,DHTTYPE2);
4. float humidityData2;
5. float temperatureData2;
6. int sensor2 = A1;
7. int output_value2;
8. int map_value2;

```

Rows 1-3 are used to define variables and pins for DHT11. Rows 4-5 used to declare variables for temperature and room 2. Row six to declare variables for soil detection sensors and pins for sensors. Row to 7-8 to declare variables for data obtained from soil detection sensors room 2.

```

1. char server[] = "192.168.1.8";
2. IPAddress ip(192,168,1,103);
3. EthernetClient client

```

Line 1 is to define the IP for the server which will be used as the address for the sensor's data receiver. Row 2 is used to specify IP to the client which will be used for sensor data transfer.

```

1. if (client.connect(server, 80)) {
2. Serial.println("connected");
3. Serial.print("GET /projec/data.php?humidity1=");
4. client.print("GET /projec/data.php?humidity1=");
5. Serial.println(humidityData1);
6. client.print(humidityData1);

```

Line 1 determines if a client is connected to the server in port 80. Line 2 once it's successfully connected to the server in port 80 it comes up to notice that the client has connected to the server. Line 3-6 as a client that sent the sensor data to the serve

5.1.2 Server

To enter the PHPMyAdmin database requires a server that acts as the sensor's data receiver. Programs from servers like the ones below:

```

1. if($_GET['humidity1'] != '' and $_GET['temperature1'] != ''
   and $_GET['tanah1'] != '' and
2. $_GET['humidity2'] != '' and $_GET['temperature2'] != ''
   and $_GET['tanah2'] != ''){
3. $data=new data($_GET['humidity1'], $_GET['temperature1'],
   $_GET['tanah1'], $_GET['humidity2'], $_GET['temperature2'],
   $_GET['tanah2']);

```

On line 1-3 is the method get which GET as the data received from the sensor which is then input into the data class.

```

1. function connect(){
2. $this->link = mysqli_connect('localhost','root','') or
   die('Cannot connect to the DB');
3. mysqli_select_db($this->link,'datasensor1') or die('Cannot
   select the DB');
}

```

Line 1 is making function function for connected to the database. Line 2 works to determine if it's on the computer database. Line 3 serves to determine whether or not the name of the assigned database.

```

1. function storeInDBRuang1($humidity, $temperature, $tanah){
2. $query = "insert into ruang1 set humidity='" . $humidity.
   "', temperature='" . $temperature. "', tanah='" .
   $tanah . "'";
3. $result = mysqli_query($this->link,$query) or die('Errant
   query: ' . $query);
}

```

Line 1 is creating a funtion to input sensor data into the established database. Row 2-3 sends the received data from the sensor to the 1 room database already created.

```

1. function storeInDBRuag2($humidity, $temperature, $tanah){
2.   $query = "insert into ruang2 set humidity='" . $humidity.
   ',      temperature='" . $temperature.      "',      tanah='" .
   $tanah ."'";
3. $result = mysqli_query($this->link,$query) or die('Errant
   query:  ' . $query);
}

```

Line 1 is creating a function to input sensor data into the established database. Row 2-3 sends the received data from the sensor to the already created room 2 database.

5.1.3 HTML

To perform the monitoring phase with the web it takes an HTML page to view data of research results and results from predictions made. Below are the programs used to show sensor data and predictions made:

```

1. <font size="8" face="Bernard MT Condensed"
   color="#A9A9A9">DATA SENSOR</font><br></br>
2. <table>
3. <tr>
4. <td>
5. <table border="1">
6. <tr>
7. <th rowspan="2" bgcolor="yellow">NO.</th>
8. <th colspan="4" bgcolor="#00ff80">RUANGAN 1</th>
9. </tr>
10. <tr>
11. <th bgcolor="#6495ED">Humidity</th>
12. <th bgcolor="#6495ED">Temperature</th>
13. <th bgcolor="#6495ED">K.Tanah</th>
14. <th bgcolor="#FFA500">Date</th>
15. </tr>
16. <?php while ($row=mysqli_fetch_assoc($result)):?>

```

```

17. <tr>
18. <td><?php echo $row["id"]; ?></td>
19. <td><?php echo $row["humidity"]; ?> %</td>
20. <td><?php echo $row["temperature"]; ?> C</td>
21. <td><?php echo $row["tanah"]; ?> %</td>
22. <td><?php echo $row["date"]; ?></td>
23. </tr>
24. <?php endwhile; ?>
25. </table>
26. </td>

```

Line 1 makes a title for the HTML monitoring page, on line 2-4 is the creation for the table to be used. Rows 5-9 to make the description on the table of Numbers and room names. On line 10-15 for making descriptions on the table of nutrients, temperature and moisture. Lines 16-24 to create a loop in order to display the data to be shown in accordance with the Numbers we have prepared.

Line 1 makes a title for the HTML monitoring page, on line 2-4 is the creation for the table to be used. Rows 5-9 to make the description on the table of Numbers and room names. On line 10-15 for making descriptions on the table of nutrients, temperature and moisture. Lines 16-24 to create a loop in order to display the data to be shown in accordance with the Numbers we have prepared.

```

1. <table border="1">
2. <tr>
3. <th rowspan="1" bgcolor="yellow">KTRNG</th>
4. <th colspan="24" bgcolor="#00ff80">PREDIKSI RUANGAN 1 --
   [ H+1 ]--</th>
5. </tr>
6. <tr>
7. <th rowspan="1" bgcolor="#FFA500">Periode/Jam</th>
8. <th bgcolor="#9ACD32">25</th>
9. <th bgcolor="#9ACD32">26</th>
10.<th bgcolor="#9ACD32">27</th>
11.<th bgcolor="#9ACD32">28</th>
12.th bgcolor="#9ACD32">29</th>
13.<th bgcolor="#9ACD32">30</th>
14.<th bgcolor="#9ACD32">31</th>
15.<th bgcolor="#9ACD32">32</th>
16.<th bgcolor="#9ACD32">33</th>
17.<th bgcolor="#9ACD32">34</th>
18.<th bgcolor="#9ACD32">35</th>
19.<th bgcolor="#9ACD32">36</th>
20.<th bgcolor="#9ACD32">37</th>
21.<th bgcolor="#9ACD32">38</th>
22.<th bgcolor="#9ACD32">39</th>
23.<th bgcolor="#9ACD32">40</th>
24.<th bgcolor="#9ACD32">41</th>
25.<th bgcolor="#9ACD32">42</th>
26.<th bgcolor="#9ACD32">43</th>
27.<th bgcolor="#9ACD32">44</th>
28.<th bgcolor="#9ACD32">45</th>
29.<th bgcolor="#9ACD32">46</th>
30.<th bgcolor="#9ACD32">47</th>
31.<th bgcolor="#9ACD32">48</th>
32.</tr>
33.<tr>
34.<th rowspan="1" bgcolor="#6495ED">Humidity</th>

```



```

35.<?php foreach ($regresi2->all12 as $data2) {echo "<td>".
    $data2 =    number_format($data2, 2, '.', '')."</td>";}??
36.</tr>
37.<tr>
38.<th rowspan="1" bgcolor="#6495ED">Temperature</th>
39.<?php foreach ($regresi4->all14 as $data4) {echo "<td>".
    $data4 = number_format($data4, 2, '.', '')."</td>";}??
40.</tr>
41.<tr>
42.<th rowspan="1" bgcolor="#6495ED">K.Tanah</th>
43.<?php foreach ($regresi->all as $periode1) {echo "<td>".
    $periode1= number_format($periode1, 2, '.', '')."</td>";}??
44.</tr>
45.</table>
46.</td>

```

Line 1-5 making a chart and description of the table which is the KTRNG and the predictions of room 1. Row 6-32 to collect information on the predictive data for a modified array colom from its data into a string and two-point round is done on the back of 0. On line 37-40 to show the predictive data for a colom that's been altered from the array data to a string and is done by a two-point grid of zeroes. For row 41-44 reporting predictability data for the soil humidity colom that had been altered from the array data to a string and was done by two-point grid zeroes.

```

1. $result7= mysqli_query ($koneksi," SELECT id From ruang1
LIMIT 24");
2. $result8= mysqli_query ($koneksi," SELECT tanah From
ruang1 LIMIT 24");

3. $x = [];
4. while ($obj1=mysqli_fetch_assoc($result7)) {
5.     array_push($x, $obj1["id"]);
6. }
7. $y = [];
8. while ($obj2=mysqli_fetch_assoc($result8)) {

```

```

9.     array_push($y, $obj2["tanah"]);
10.    }

11.    $regresi = new RegresiLinier($x, $y);

12.    Class RegresiLinier{

13.        public $x,
14.            $y,
15.            $n,
16.            $x2,
17.            $y2,
18.            $xy,
19.            $a,
20.            $b,
21.            $all;

22.        public function __construct($x=null, $y=null){
23.            if(!is_null($x) && !is_null($y)){
24.                $this->x = $x;
25.                $this->y = $y;
26.                $this->compute();
27.            }
28.        }

29.        public function compute(){
30.            if(is_array($this->x) && is_array($this->y))
31.            {
32.                if(count($this->x) == count($this->y)){
33.                    $this->n = count($this->x);
34.                    $this->prepare_calculation();
35.                    $this->ab();

```



```
36.             $this->linear_regression();
37.         }
38.     else{
39.         throw new Exception(' X dan Y harus
sama');
40.     }

41.     }
42.     else{
43.         throw new Exception(' X atau Y kosong');
44.     }
45. }

46.     public function prepare_calculation(){
47.         $this->x2 = array_map(function($n){
48.             return $n * $n;
49.         }, $this->x);
50.         $this->y2 = array_map(function($n){
51.             return $n * $n;
52.         }, $this->y);

53.         for($i=0; $i<$this->n; $i++){
54.             $this->xy[$i] = $this->x[$i] * $this-
>y[$i];
55.         }

56.     }

57.     public function ab(){

58.         $a = ((array_sum($this->y) *
array_sum($this->x2)) - (array_sum($this->x) *
array_sum($this->xy))) / (($this->n * array_sum($this-
>x2)) - (array_sum($this->x) * array_sum($this->x)));
59.         $this->a = $a;
```

```

60.         $b = (($this->n * array_sum($this->xy)) -
              (array_sum($this->x) * array_sum($this->y))) / (($this->n
              * array_sum($this->x2)) - (array_sum($this->x) *
              array_sum($this->x)));
61.         $this->b = $b;
62.     }

63.     public function forecast($xfore){
64.         $y = $this->a + ($this->b * $xfore );
65.         return $y;
66.     }

67.     public function linear_regression(){
68.         $n = 25;
69.         // $this->forecast(11);
70.         foreach($this->x as $xnew){
71.             $this->all[$n] = $this->forecast($n);
72.             $n++;
73.         }
74.     }
75. }

```

On line 1-2 to call data from a remote database to predict. Line 3-11 to input data from a database that was called in and converted into a form array for calculating. Line 12-21 does a declaration for the variables to be used for predictive calculations. Rows 22-45 do a total accounting for X and Y values and do a check on the amount of data present in both variables if they already have the same number. Line 46-56 compresses the value of X2, Y2, and XY by adding value X and X is delicious, multiplying the Y's value with Y's own value, multiplying X, Y, X2, Y2, XY already obtained to determine the value of a and b that are to be used for prediction. Lines 64-67 perform predictive calculations by using A's and B's to determine Y's value as a result of predictions. Rows 68-73 determine which period to be predicted by which to define the value of X as period.

5.2 Testing

These images below show a Microcontroller already connected to the Internet, data already sent to the PHPMyAdmin database, and the sensor data shown on the web with its predictive charts and its second-day compare chart and predictions for each room.

1. Data retrieval process for air humidity levels, molds, and soil humidity to two rooms that are used in pricing. The removal of data on air humidity, room temperature, and soil humidity takes place for two days or 48 hours.



Illustration 5.1: Retrieve Data

2. Microcontroller will print the status on the serial monitor on the Arduino Ide. I the microcontroller has successfully connected the internet properly then the microcontroller will print on the series of monitors on Arduino IDE such as in the pictue below.



```
COM6  
  
connected  
GET /projec/data.php?humidity1=76.00  
&temperature1=  
30.40  
&tanah1=  
89  
&humidity2=  
79.00  
&temperature2=  
29.20  
&tanah2=  
96  
  
 Autoscroll  Show timestamp
```

Illustration 5.2: Serial Monitor

3. Once the microcontroller has successfully connected to the internet, data from the DHT11 sensor and the soil stream will be sent to a prepared database. Below is a drawing that shows that data of air humidity, room temperature and soil humidity from each room have been successfully stored in the PHPMYAdmin database.

	Ubah	Salin	Hapus	ID	Humidity	Temperature	Timestamp	
<input type="checkbox"/>	Ubah	Salin	Hapus	1	83	30.7	86	2020-06-18 12:44:43
<input type="checkbox"/>	Ubah	Salin	Hapus	2	83	30.7	85	2020-06-18 13:44:42
<input type="checkbox"/>	Ubah	Salin	Hapus	3	80	30.6	84	2020-06-18 14:44:41
<input type="checkbox"/>	Ubah	Salin	Hapus	4	78	30.7	83	2020-06-18 15:44:41
<input type="checkbox"/>	Ubah	Salin	Hapus	5	79	31.2	82	2020-06-18 16:44:40
<input type="checkbox"/>	Ubah	Salin	Hapus	6	81	31.2	81	2020-06-18 17:44:40
<input type="checkbox"/>	Ubah	Salin	Hapus	7	88	31	81	2020-06-18 18:44:39
<input type="checkbox"/>	Ubah	Salin	Hapus	8	89	31	80	2020-06-18 19:44:38
<input type="checkbox"/>	Ubah	Salin	Hapus	9	89	30.7	79	2020-06-18 20:44:38
<input type="checkbox"/>	Ubah	Salin	Hapus	10	88	31	78	2020-06-18 21:44:37
<input type="checkbox"/>	Ubah	Salin	Hapus	11	87	31.3	77	2020-06-18 22:44:37
<input type="checkbox"/>	Ubah	Salin	Hapus	12	89	30.7	77	2020-06-18 23:44:36
<input type="checkbox"/>	Ubah	Salin	Hapus	13	90	30.6	76	2020-06-19 00:44:36
<input type="checkbox"/>	Ubah	Salin	Hapus	14	91	30.1	75	2020-06-19 01:44:35
<input type="checkbox"/>	Ubah	Salin	Hapus	15	91	30.2	74	2020-06-19 02:44:34
<input type="checkbox"/>	Ubah	Salin	Hapus	16	87	29.9	73	2020-06-19 03:44:34
<input type="checkbox"/>	Ubah	Salin	Hapus	17	85	30.4	72	2020-06-19 04:44:33
<input type="checkbox"/>	Ubah	Salin	Hapus	18	83	30.3	71	2020-06-19 05:44:33
<input type="checkbox"/>	Ubah	Salin	Hapus	19	81	30.2	71	2020-06-19 06:44:32
<input type="checkbox"/>	Ubah	Salin	Hapus	20	81	30	70	2020-06-19 07:44:32
<input type="checkbox"/>	Ubah	Salin	Hapus	21	79	30.4	69	2020-06-19 08:44:31
<input type="checkbox"/>	Ubah	Salin	Hapus	22	83	30	68	2020-06-19 09:44:31
<input type="checkbox"/>	Ubah	Salin	Hapus	23	82	30.4	67	2020-06-19 10:44:29
<input type="checkbox"/>	Ubah	Salin	Hapus	24	80	30.3	67	2020-06-19 11:44:29
<input type="checkbox"/>	Ubah	Salin	Hapus	25	82	30.6	66	2020-06-19 12:44:28

Illustration 5.3: Database room 1

Server: 127.0.0.1 » Basis data: datasensor1 » Tabel: ruang2

	Jelajahi	Struktur	SQL	Cari	Tambahkan	Ekspor	Impor	
<input type="checkbox"/>	Ubah	Salin	Hapus	1	56	23.4	88	2020-06-18 12:44:43
<input type="checkbox"/>	Ubah	Salin	Hapus	2	55	23.3	88	2020-06-18 13:44:42
<input type="checkbox"/>	Ubah	Salin	Hapus	3	51	22.7	87	2020-06-18 14:44:41
<input type="checkbox"/>	Ubah	Salin	Hapus	4	49	22.6	86	2020-06-18 15:44:41
<input type="checkbox"/>	Ubah	Salin	Hapus	5	53	22.4	85	2020-06-18 16:44:40
<input type="checkbox"/>	Ubah	Salin	Hapus	6	53	24.5	84	2020-06-18 17:44:40
<input type="checkbox"/>	Ubah	Salin	Hapus	7	48	24.9	84	2020-06-18 18:44:39
<input type="checkbox"/>	Ubah	Salin	Hapus	8	53	23	83	2020-06-18 19:44:38
<input type="checkbox"/>	Ubah	Salin	Hapus	9	54	23.6	83	2020-06-18 20:44:38
<input type="checkbox"/>	Ubah	Salin	Hapus	10	55	24.2	82	2020-06-18 21:44:37
<input type="checkbox"/>	Ubah	Salin	Hapus	11	54	24.4	82	2020-06-18 22:44:37
<input type="checkbox"/>	Ubah	Salin	Hapus	12	56	24.3	81	2020-06-18 23:44:36
<input type="checkbox"/>	Ubah	Salin	Hapus	13	54	24.4	80	2020-06-19 00:44:36
<input type="checkbox"/>	Ubah	Salin	Hapus	14	53	24	79	2020-06-19 01:44:35
<input type="checkbox"/>	Ubah	Salin	Hapus	15	48	22.2	79	2020-06-19 02:44:34
<input type="checkbox"/>	Ubah	Salin	Hapus	16	48	22.1	78	2020-06-19 03:44:34
<input type="checkbox"/>	Ubah	Salin	Hapus	17	42	23.8	77	2020-06-19 04:44:33
<input type="checkbox"/>	Ubah	Salin	Hapus	18	42	23.9	77	2020-06-19 05:44:33
<input type="checkbox"/>	Ubah	Salin	Hapus	19	42	24.1	76	2020-06-19 06:44:32
<input type="checkbox"/>	Ubah	Salin	Hapus	20	43	24.2	76	2020-06-19 07:44:32
<input type="checkbox"/>	Ubah	Salin	Hapus	21	45	24.7	75	2020-06-19 08:44:31
<input type="checkbox"/>	Ubah	Salin	Hapus	22	40	24.4	74	2020-06-19 09:44:31
<input type="checkbox"/>	Ubah	Salin	Hapus	23	40	24.8	74	2020-06-19 10:44:29
<input type="checkbox"/>	Ubah	Salin	Hapus	24	41	25.2	73	2020-06-19 11:44:29
<input type="checkbox"/>	Ubah	Salin	Hapus	25	42	25.5	72	2020-06-19 12:44:28

Konsole

Illustration 5.4: Database room 2

- From data already stored in the database to be used to display on the web monitoring and to predict humidity levels, room temperature, and soil humidity. The picture below will monitor for monitoring and predictions of air humidity, room temperature, and soil humidity in each room.

DATA SENSOR

NO.	RUANGAN 1				NO.	RUANGAN 2			
	Humidity	Temperature	K.Tanah	Date		Humidity	Temperature	K.Tanah	Date
50	76 %	30.4 C	89 %	2020-06-20 15:24:31	50	79 %	29.2 C	96 %	2020-06-20 15:24:31
49	79 %	30.5 C	48 %	2020-06-20 11:45:35	49	51 %	21.2 C	56 %	2020-06-20 11:45:35
48	79 %	30.2 C	48 %	2020-06-20 11:44:13	48	50 %	20.7 C	56 %	2020-06-20 11:44:13
47	83 %	29.8 C	49 %	2020-06-20 10:44:13	47	49 %	20 C	57 %	2020-06-20 10:44:13
46	83 %	29.7 C	50 %	2020-06-20 09:44:14	46	49 %	23.3 C	57 %	2020-06-20 09:44:14
45	84 %	29.6 C	51 %	2020-06-20 08:44:14	45	49 %	22.4 C	58 %	2020-06-20 08:44:14
44	81 %	29.3 C	52 %	2020-06-20 07:44:15	44	49 %	21.7 C	59 %	2020-06-20 07:44:15
43	79 %	29.4 C	52 %	2020-06-20 06:44:16	43	50 %	21.2 C	60 %	2020-06-20 06:44:16
42	85 %	29.3 C	53 %	2020-06-20 05:44:17	42	49 %	20.5 C	60 %	2020-06-20 05:44:17
41	86 %	29.2 C	54 %	2020-06-20 04:44:18	41	52 %	23.3 C	61 %	2020-06-20 04:44:18

KTRNG	PREDIKSI RUANGAN 1 --[H+1]--																							
Periode/Jam	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Humidity	84.12	84.09	84.06	84.03	84.01	83.98	83.95	83.92	83.90	83.87	83.84	83.81	83.79	83.76	83.73	83.71	83.68	83.65	83.62	83.60	83.57	83.54	83.51	83.49
Temperature	30.08	30.04	30.00	29.96	29.93	29.89	29.85	29.81	29.77	29.73	29.69	29.65	29.61	29.58	29.54	29.50	29.46	29.42	29.38	29.34	29.30	29.26	29.23	29.19
K.Tanah	65.66	64.83	63.99	63.16	62.32	61.49	60.66	59.82	58.99	58.15	57.32	56.49	55.65	54.82	53.98	53.15	52.32	51.48	50.65	49.82	48.98	48.15	47.31	46.48

KTRNG	PREDIKSI RUANGAN 2 --[H+1]--																							
Periode/Jam	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Humidity	40.93	40.29	39.65	39.00	38.36	37.72	37.08	36.44	35.79	35.15	34.51	33.87	33.23	32.58	31.94	31.30	30.66	30.01	29.37	28.73	28.09	27.45	26.80	26.16
Temperature	24.54	24.60	24.66	24.72	24.78	24.84	24.90	24.96	25.02	25.08	25.14	25.20	25.26	25.32	25.38	25.44	25.50	25.56	25.62	25.68	25.74	25.80	25.86	25.92
K.Tanah	72.29	71.64	70.98	70.33	69.68	69.02	68.37	67.72	67.06	66.41	65.76	65.10	64.45	63.79	63.14	62.49	61.83	61.18	60.53	59.87	59.22	58.57	57.91	57.26

Illustration 5.5: Monitoring data

Here is a chart of actual circumstance comparisons and predictions:

NO	Tabel prediksi humidity ruangan 1			
	Humidity	Prediksi	Selisih	Persentase
1.	82	84.12	2.12	97.48%
2.	80	84.09	4.09	95.14%
3.	80	84.06	4.06	95.17%
4.	79	84.03	5.03	94.01%
5.	80	84.01	4.01	95.23%
6.	78	83.98	5.98	92.88%
7.	80	83.95	3.95	95.29%
8.	81	83.92	2.92	96.52%
9.	82	83.90	1.9	97.74%
10.	83	83.87	0.87	98.96%
11.	84	83.84	0.16	99.81%
12.	84	83.81	0.19	99.77%
13.	86	83.79	2.21	97.43%
14.	86	83.76	2.24	97.40%
15.	84	83.73	0.27	99.68%
16.	86	83.71	2.26	97.34%
17.	86	83.68	2.32	97.30%
18.	85	83.65	1.35	98.41%
19.	79	83.62	4.62	94.48%
20.	81	83.60	2.6	96.89%
21.	84	83.57	0.43	99.49%
22.	83	83.54	0.54	99.35%
23.	83	83.51	0.51	99.39%
24.	79	83.49	4.49	94.62%
Rata-rata persentase:				97.07%

Illustration 5.6: Room 1 prediction humidity

The results of predictions made by air ducts in 1 that did not use air conditioners range from 0,1-6 comparison from data obtained and precision results. The average of predictions made to predict air humidity for the next 24 hours are 97,07%, has high accuracy.

Tabel prediksi temperatur ruangan 1				
NO	Temperature	Prediksi	Selisih	Persentase
1.	30.6	30.08	0.52	98.30%
2.	30.5	30.04	0.46	98.49%
3.	30.7	30	0.7	97.72%
4.	30.9	29.96	0.94	96.96%
5.	30.9	29.93	0.97	96.86%
6.	31.6	29.89	1.71	94.59%
7.	31.5	29.85	1.65	94.76%
8.	31	29.81	1.19	96.16%
9.	30.6	29.77	0.83	97.29%
10.	30.9	29.73	1.17	96.21%
11.	30.5	29.69	0.81	97.34%
12.	30.3	29.65	0.65	97.85%
13.	30.2	29.61	0.59	98.05%
14.	29.9	29.58	0.32	98.93%
15.	30.1	29.54	0.56	98.14%
16.	29.7	29.5	0.2	99.33%
17.	29.2	29.46	0.26	99.12%
18.	29.3	29.42	0.12	99.59%
19.	29.4	29.38	0.02	99.93%
20.	29.3	29.34	0.04	99.86%
21.	29.6	29.3	0.3	98.99%
22.	29.7	29.26	0.44	98.52%
23.	29.8	29.23	0.57	98.09%
24.	30.2	29.19	1.01	96.66%
Rata-rata persentase:				97.82%

Illustration 5.7: Room 1 Prediction Temperatur

The result of predictions made for temperature in room 1 that did not use the pendant of the room had a range of 0,02 to a comparison of the data obtained and data obtained from pression. The average of predictions made to predict room temperature for the next 24 hours are 97,82%, has high accuracy.

NO	Tabel prediksi tanah ruangan 1			
	Tanah	Prediksi	Selisih	Persentase
1.	66	65.66	0,34	99.48%
2.	65	64.83	0,17	99.74%
3.	64	63.99	0,01	99.98%
4.	63	63.16	0,16	99.75%
5.	62	62.32	0,32	99.49%
6.	61	61.49	0,49	99.20%
7.	61	60.66	0,34	99.44%
8.	60	59.82	0,18	99.70%
9.	60	58.99	1,01	98.32%
10.	59	58.15	0,85	98.56%
11.	58	57.32	0,68	98.83%
12.	57	56.49	0,51	99.11%
13.	57	55.65	1,35	97.63%
14.	56	54.82	1,18	97.89%
15.	55	53.98	1,02	98.15%
16.	54	53.15	0,85	98.43%
17.	54	52.32	1,68	96.89%
18.	53	51.48	1,52	97.13%
19.	52	50.65	1,35	97.40%
20.	52	49.82	2,18	95.81%
21.	51	48.98	2,02	96.04%
22.	50	48.15	1,85	96.30%
23.	49	47.31	1,69	96.55%
24.	48	46.48	1,52	96.83%
Rata-rata persentase:				98.19%

Illustration 5.8: Room 1 Prediction Soil Humidity

The result of predictions made for soil humidity in room 1 that did not use priests in the room had a discrepancy of 0.01-2.5 for comparison of data obtained and data obtained from presents. The average of predictions made to predict soil humidity levels for room 1 in the next 24 hours would be 98,19%, has high accuracy.

Table prediksi humidity ruangan 2				
NO	Humidity	Prediksi	Selisih	Persentase
1.	42	40.93	1.07	97.45%
2.	56	40.29	15.71	71.95%
3.	56	39.65	16.35	70.80%
4.	55	39.00	16	70.91%
5.	56	38.36	17.64	68.50%
6.	57	37.72	19.28	66.18%
7.	57	37.08	19.92	65.05%
8.	61	36.44	24.46	59.74%
9.	59	35.79	23.21	60.66%
10.	59	35.15	24.2	59.58%
11.	65	34.51	30.49	53.09%
12.	64	33.87	30.13	52.92%
13.	52	33.23	18.77	63.90%
14.	52	32.58	19.42	62.65%
15.	51	31.94	19.06	62.63%
16.	51	31.30	19.7	61.37%
17.	52	30.66	21.34	58.96%
18.	49	30.01	18.99	61.24%
19.	50	29.37	20.63	58.74%
20.	49	28.73	20.27	58.63%
21.	49	28.09	20.92	57.33%
22.	49	27.45	21.55	56.02%
23.	49	26.80	22.2	54.69%
24.	50	26.16	23.84	52.32%
Rata-rata persentase:				62.72%

Illustration 5.9: Room 2 Prediction Humidity

The results of predictions made for air humidity in room 2 that using pendages vary from 0.7 - 23.9 to comparisons of data obtained and data obtained from pressents. The average of predictions made to predict air humidity levels for room 2 in the next 24 hours are 62,72%, has low accuracy.

Table prediksi temperatur ruangan 2				
NO	Temperature	Prediksi	Selisih	Persentase
1.	25.5	24.54	0.96	96.24%
2.	20.5	24.60	4.1	83.33%
3.	20.7	24.66	3.96	83.94%
4.	20.9	24.72	3.82	84.55%
5.	21	24.78	3.78	84.75%
6.	22.2	24.84	2.64	89.37%
7.	22.7	24.90	2.2	91.16%
8.	23.1	24.96	1.86	92.55%
9.	23.8	25.02	1.22	95.12%
10.	24.4	25.08	0.68	97.29%
11.	24.8	25.14	0.34	98.65%
12.	25.1	25.20	0.1	99.60%
13.	21.8	25.26	3.46	86.30%
14.	22.1	25.32	3.22	87.28%
15.	22.4	25.38	2.98	88.26%
16.	23	25.44	2.44	90.41%
17.	23.3	25.50	2.2	91.37%
18.	20.5	25.56	5.06	80.20%
19.	21.2	25.62	4.42	82.75%
20.	21.7	25.68	3.98	84.50%
21.	22.4	25.74	3.34	87.02%
22.	23.3	25.80	2.5	90.31%
23.	20	25.86	5.86	77.34%
24.	20.7	25.92	5.22	79.86%
Rata-rata persentase:				88.42%

Illustration 5.10: Room 2 Prediction Temperatur

The results of predictions made for air temperature in room 2 that using pendages vary from 0.1- 6 to comparison from data obtained and data obtained from presents. The average of predictions made to predict the temperature levels for room 2 in the next 24 hours would be 88,42%, has considerable accuracy.

NO	Table prediksi tanah ruangan 2			
	Tanah	Prediksi	Selisih	Persentase
1.	72	72.29	0.29	99.60%
2.	71	71.64	0.64	99.11%
3.	71	70.98	0.98	99.97%
4.	70	70.33	0.33	99.53%
5.	69	69.68	0.68	99.02%
6.	69	69.02	0.02	99.97%
7.	68	68.37	0.37	99.46%
8.	68	67.72	1.72	99.59%
9.	67	67.06	0.06	99.91%
10.	66	66.41	0.41	99.38%
11.	65	65.76	0.76	98.84%
12.	64	65.10	1.10	98.31%
13.	64	64.45	0.45	99.30%
14.	63	63.79	0.79	98.76%
15.	62	63.14	1.14	98.19%
16.	62	62.49	0.49	99.22%
17.	61	61.83	0.83	98.66%
18.	60	61.18	1.18	98.07%
19.	60	60.53	0.53	99.12%
20.	59	59.87	0.83	98.55%
21.	58	59.22	1.22	97.94%
22.	57	58.57	1.57	97.32%
23.	57	57.91	0.91	98.43%
24.	56	57.26	1.26	97.80%
Rata-rata persentase:				98.91%

Illustration 5.11:Room 2 Prediction Soil Humidity

Has considerable accuracy. The results of predictions made for soil humidity in room 2 that using pendslings in the room range from 0.1-2 to a comparison of the data obtained and data obtained from presssion. The average of predictions made to predict soil humidity levels for room 2 in the next 24 hours are 98,91%, has high accuracy.