

Report

by Kieran John Ayres

FILE	2962_KIERAN_JOHN_AYRES_REPORT_236131_1507183412.DOCX (1.26M)		
TIME SUBMITTED	28-FEB-2020 01:45PM (UTC+0000)	WORD COUNT	865
SUBMISSION ID	120906418	CHARACTER COUNT	4245



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23/10/2019

Database Management Systems/**ACCA5014**

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Introduction

The focal point of this essay is to explain the technicalities of the implementation of the rainfall data website/application. This will be assisted with some sections of code along with screenshots of the website/application when active. These will focus on the features that the developer chose, these were split into the following sections; Security, Sorting Data, Order, Graph and then will be finished with a conclusion.

Project Initiation Document

1. Security Measures

Firstly, the assignment will discuss the necessary security measures taken. The PHP script/HTML file was connected to a database. Here is a screenshot of the fields in the “user” table in the database.

☐	1	id	int(3)	No	None	AUTO_INCREMENT	Change	Drop	More
☐	2	username	varchar(20) latin1_swedish_ci	No	None		Change	Drop	More
☐	3	password	varchar(20) latin1_swedish_ci	No	None		Change	Drop	More
☐	4	admin	bit(1)	No	None		Change	Drop	More

Figure 1

The first security measure that was implemented was a login. A screenshot can be seen below of the page “index.php”, this was a login page. This was so the user would have to login before being allowed access to view the website/application. However, a measure was taken to ensure someone couldn’t just direct themselves to the website without logging in. So, if for example, they were to try and view the data without logging in. Here is the code below for this. The code uses an if statement that would pass it would login, however, if not it would deny you access to the website.

```
else
{
    echo "Access Denied!";
}
```

Figure 2

Welcome to my webpage, Smart and Connected Devices 1

A webpage, for showing data concerning the weather.

Username:

Password:

Figure 3

The variable types were essential to the security of the database. In particular, the datatype of the field "admin". This was set as "Bit". This is essentially, a Boolean however, SQL tends to work better with Bit [1] it was used so only the admin could have the option of doing a data transfer to the database. It was done by assigning the value of 1 to the admin, 1 being the value of "True", meaning they would be granted access to this administrative right. There is a sample of the code below written to show this.

```
if($_SESSION["admin"] == 1)
{
    echo "<a href = 'transferdata.php'> Transfer the Data? </a>";
}
```

Figure 4

2. Transferring Data

The first thing that had to be done was to transfer the data from the flat text file into the database. This was so the developer could populate the database after it was set up so the data could have been worked with. A code snippet can be seen below. This was so the script would copy it in. This code was duplicated 3 times for the three different sensors with the number for the data for each sensor. This is shown under this snippet of code. Showing two examples, with each one representing a different sensor.

```
43 $data=fread($filelink,filesize($myfile));//read entire file
44
45 fclose($filelink);//close the file
46
47 $incoming=array();
48 $incoming=explode(chr(13),$data);
49
50 $length=sizeof($incoming);//how big is the array?
51
52 $tempdata=array();
53
54 for($x=0;$x<$length;$x++)
55 {
56     $incoming[$x]=trim($incoming[$x]);//clean off the linebreak
57     $tempdata=explode(" ",$incoming[$x]);//split current line of data
58     $timeofreading=$tempdata[1]." ".$tempdata[2];//stick datestamp ba
59     $rainfall=trim($tempdata[0]);//rainfall reading
60 }
```

Figure 5

```
61 $query="INSERT INTO rainfalldata(mydata,thedata,sensor)
62 VALUES ($rainfall, '$timeofreading', 2)";
```

Figure 6

```
97 $query="INSERT INTO rainfalldata(mydata,thedata,sensor)
98 VALUES ($rainfall, '$timeofreading', 3)";
```

3. Sorting Data

The next section will focus on the next set of features that the developer decided to implement with the website/application.

Here is a screenshot of the rainfall data database structure:

1	id	int(3)	No	None	AUTO_INCREMENT	Change	Drop
2	mydata	int(20)	No	None		Change	Drop
3	thedata	timestamp	No	current_timestamp()	ON UPDATE CURRENT_TIMESTAMP()	Change	Drop
4	sensor	int(1)	No	None		Change	Drop

Figure 7

The developer chose to make pages to show the data like this because it gives more clarity to look at the columns filtered, the 1st data shown was from the column “mydata”. This was to show the recorded rainfall and then the second filter that was implemented was used to show only the date of the rainfall.

This is shown in the screenshot below:

Filter the Data, here we'll look at the column, "thedata"

[Go back to the login screen?](#) 2019-12-14 14:15:51

[illegible]

Figure 8

4. Order

The next feature is to show the data ordered, this can help the user see the data and further interpret it and make some more conclusions.

The query that was used to do this, was this, this is a query that orders the “mydata” column by ascending order. The result of this is shown under the query.

```
13 $query= "SELECT mydata FROM rainfalldata ORDER BY mydata ASC";
14 $result=mysqli_query($link,$query);
15 $numrows=mysqli_num_rows($result); //how many rows?
```

Figure 9

This page is for Data Interpretation

This will show the data in ascending order, so it will show the days with zero going to the days with the most

[Go back to the login screen?](#)

[illegible]

This one in particular was used because it can show the user how many times there was no rainfall. Or when how many occasions where there was the max rainfall.

5. Graph

The graph was a challenge as it required to add in the library file.

This is the graph that the developer chose, this graph may not represent the data in a way which is highly useful as it takes all the rainfall data, from the sensor, to the data to the date of the rainfall. To edit this, it would need a new query which specifies something other than just the generic data. This graph was added as a feature as it can allow the user to help interpret the data to make meaningful conclusions.

Currently, this is the graph which is ran using the following query:

```
12 $query="SELECT mydata FROM rainfalldata";  
13 $result=mysqli_query($link,$query);
```

Figure 10

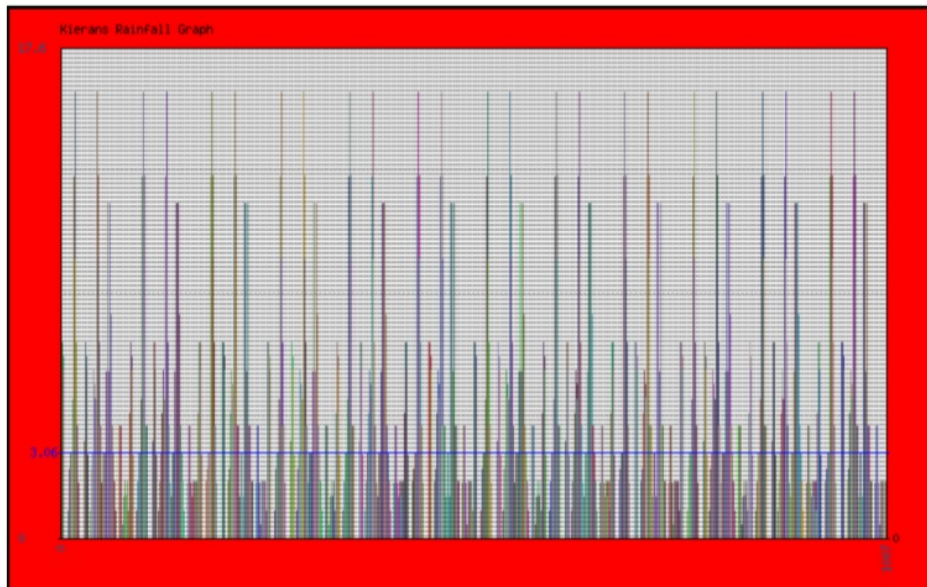


Figure 11

Conclusion

To conclude, from this assignment, the developer has learnt and encountered many new challenges, the main challenge that they encountered was using a language that they were relatively new to. They also learnt how to use the WAMP server software to assist in their development. Overall they found it a challenging process as some queries, if they were written wrong would need changing until they were working.

References

- [1] "SQL Server BIT," SQLServerTUTORIAL.NET, [Online]. Available:
<https://www.sqlservertutorial.net/sql-server-basics/sql-server-bit/>. [Accessed 27th
February 2020].

Bibliography

- [1] "SQL Server BIT," SQLServerTUTORIAL.NET, [Online]. Available:
<https://www.sqlservertutorial.net/sql-server-basics/sql-server-bit/>. [Accessed 27th
February 2020].

Report

GRADEMARK REPORT

FINAL GRADE

54/100

GENERAL COMMENTS

Instructor

Data management - Generally OK, but some of the field lengths you've chosen are a bit short, eg password at only 10. You have transferred the data albeit in a copy and pasted way, it would be more efficient/expandable using a loop or function. 6/10

Range of HTML/PHP coding demonstrated - There is some searching implemented but it is not fully working. It would be better to have searches where you can filter by more than one attribute at a time eg sensor X on date X rather than limiting to just sensor or just date. Login is good. 13/25

Visualisation of data using graphs - Graphs are hardcoded but not embedded as an image. For greater functionality you could allow the user to filter by using a HTML form to pass a parameter to the graph. The axes need to show the date to allow the user to interpret the data 8 /15

Overall integration of website - A bit of a basic layout. You could use includes to make the production of the site more efficient rather than copying and pasting code to every page. The graphs are also not linked - use hyperlinks to allow the user to navigate your site

5 /10

Knowledge and understanding overall - A reasonable understanding was demonstrated, but reflect on the points raised above

11/20

Report - Code excerpts are good, I would have liked to have seen more screenshots of the website to support the narrative. You should not be referring to yourself as "the developer". This is just "I" in disguise. Make your writing passive For example "The developer chose to make pages to show the data to give more clarity" -> "Pages were made to show the data clearly" You gone through what you did, but you need more on why you did it - a critical appraisal. Was the approach you took successful, how would you change your approach if you did the project again, what features would you include in the future etc.

11/20

Overall - 54%

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