_____*A relational database with 3 or more related tables.*
Complex queries combining data from two or more tables
*Loops*
Sorting
Simple Selection
User-Defined Objects
Objects as data records

Relational Database

My client required a website that would sufficiently allow for him to communicate certain announcements and the number of points each of our school houses has. The database is linked mostly through the house ID which I used in place of userID and administrator. My client only required that the administrator have the capability to carry functions besides viewing content. This deemed the userID and administrator function unnecessary. This means that these databases are linked through the houseID not the userID. The image belows shows the tables that I have created in mySQL.
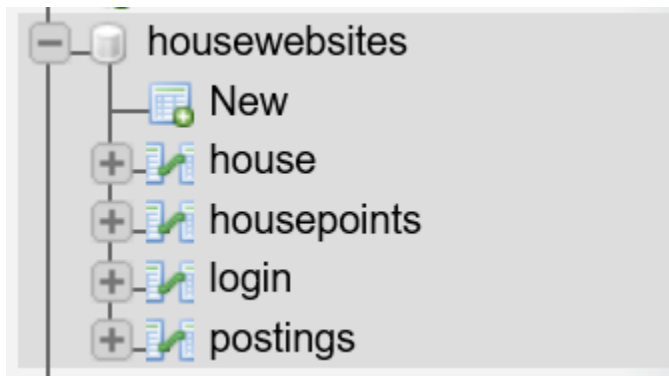
mySQL Login Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	**FName**	varchar(30)	latin1_swedish_ci		No	*None*		
2	**LName**	varchar(30)	latin1_swedish_ci		No	*None*		
3	**userID** 🔑	int(11)			No	*None*		
4	**Admin** 🔑	tinyint(1)			No	*None*		
5	**password**	varchar(100)	latin1_swedish_ci		No	*None*		
6	**Email**	varchar(2000)	latin1_swedish_ci		No	*None*		
7	**houseID**	int(11)			No	*None*		

FName	LName	userID	Admin	password	Email	houseID
Erin	Bartels	1	1	YTHgsY7j	erin_bartels@houston.nae.school	1
Gabriel	Maciel	2	1	6GcReFhy	gabriel_maciel@houston.nae.school	2
Cole	Conelly	3	1	f7Kxx8AB	cole_connelly@houston.nae.school	3
Gus	Biscotti	4	1	vcSCbU9m	gus_biscotti@houston.nae.school	4

mySQL House Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	houseID 🔑	int(11)			No	None		AUTO_INCREMENT
2	houseName	varchar(7)	latin1_swedish_ci		No	None		
3	houseImage	varchar(11)	latin1_swedish_ci		No	None		
4	headMascot	varchar(11)	latin1_swedish_ci		No	None		
5	userID	int(11)			No	None	The head of House ID	

Table with data in.

houseID	houseName	houseImage	headMascot	userID The head of House ID
1	Air			1
2	Fire			2
3	Earth			3
4	Water			4

mySQL HousePoints Table

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
☐	1	houseID	int(11)			No	None		
☐	2	weekNumber	int(11)			No	None		
☐	3	numberOfPoints	int(11)			No	None		

Table with data in

houseID	weekNumber	numberOfPoints
1	1	22
1	2	34
1	3	34
1	4	45
2	1	221
2	2	11
2	3	43
3	1	23
3	2	44
4	1	22
4	2	44
1	1	1
1	8	1
34	7	22
34	7	22
34	7	22
34	7	22
34	7	22
34	7	22
1	55	1
1	55	1
3	6	12
1	7	5
1	667	1

Posting Table Design

mySQL Posting Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	postID 🔑	int(11)			No	*None*		AUTO_INCREMENT
2	posttext	varchar(40000)	latin1_swedish_ci		No	*None*		
3	postImage	varchar(11)	latin1_swedish_ci		Yes	*NULL*		
4	dateCreated	timestamp			No	current_timestamp()		
5	houseID	int(11)			No	*None*		
6	postTitle	varchar(200)	latin1_swedish_ci		No	*None*		

postID	posttext	postImage	dateCreated	houseID	postTitle
12	the post	NULL	2020-11-12 12:39:29	1	Title
27	Wow cool post really cool	NULL	2020-11-25 12:41:46	1	Post Post
28	posting posting posssting posting	NULL	2021-02-01 12:52:22	1	Poosfksk
29	Stimbky	NULL	2021-03-01 09:54:20	1	REAL POST
30	Welcome to Fire	NULL	2021-03-22 10:29:28	2	Fire
31	Welcome to Earth House	NULL	2021-03-22 10:30:42	3	Earth
32	Welcome to water house	NULL	2021-03-22 10:31:29	4	Water
33	There will be a fire event eventually.	NULL	2021-04-19 10:38:02	2	Fire Announcements
34	There will be a Earth event.	NULL	2021-04-19 19:17:33	3	The Earth Event
35	Cool Cool Cool Cool Cool Cool Cool Cool Cool Cool	NULL	2021-04-19 19:21:10	3	The Event for Earth
25	A very nice posting yes yes	NULL	2020-11-16 09:45:34	1	Hello
26	yES	NULL	2020-11-16 09:46:15	1	Very Cool pOST
37	Earth is one of the houses at our school.	NULL	2021-04-20 17:51:16	3	Earth Postings
38	Hey Fire HOuse!	NULL	2021-04-20 18:22:30	2	Fire House
39	There will be an event soon for the Air house	NULL	2021-05-02 23:05:14	1	New Post for Air house

Admin Login

The Design

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Displays whether or not user is logged in and their name

Home   House Points   Login

Name :

Password :

The Interface

Login

UserID:

Password:

Submit

The form code

```html
<center><div class="login">
<body>
    <form method = post action = login.php>
  <fieldset>
  <div class= "loginbox">
    <p><label>UserID: <input type="int" name="userID" size="20" maxlength="2" /> </label></p>
    </div>
    <div class= "loginbox">
    <p><label>Password:<input type="varchar" name="password" size="20" maxlength="100" /></label></p>
    </div>

    </fieldset> <p align="center"><input type="Submit" name="submit" value="Submit"/></p>
    </form>
</body>
</div>
<!makes the input boxes for the login>
```

Here is the html for this code. It creates two text boxes one for UserID and one Password. When the submit button is pressed the values are submitted to login.php

login.php

```php
$userID = $_REQUEST['userID'];
$password = $_REQUEST['password'];
//Contains the variables from the earlier GET function in the login form
```

In the code above, you can see that I am accessing the data from the form.

```php
$q = "SELECT * FROM login WHERE userID='".$userID."'";
//selects the data from login for the specific userr that has logged in
```

An SQL statement must be used in order to link the database to the code. The data is specifically selected for the user who is attempting to login.

```php
elseif ($row['password'] == $password)

// Validates password in the database is equal to the value entered
    {

        header("location: admin.php?houseID=".$row['houseID']);
    //if the password is valid the user is taken to the admin page


    }

else
{
    header("location: errormessage.html");
}
```

If the password retrieved from the database is equal to the one inputted by the user, the user will be redirected to the admin page. I've used the querystring to ensure that the houseID is already inputted.

Home Points Admin Login

Sign In

Make a Post.

Post Title: [   ]

[Write your post here.   ]

HouseID: [3   ]

[Upload]

Add House Points.

HouseID: [3   ]

Housepoints: [   ]

Week Number: [   ]

[Submit the Points]

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There is an error with the information you entered

After some further discussion with my client, he told me that he would prefer a simpler interface that would be easier to interact with, as well as the design, which wasn't very appealing.

```
enter><label>UserID: <input type="int" name="houseID" size="20" maxlength="55" value=<?php echo $_GET['houseID']?> /> </label>
```

The form boxes above uses the same Get method as the login box. It uses PHP to output the previously inputted houseID into the form box.

The rows inserted into postings and housepoints are values inserted through the website. The variables from the get function are inserted into the database.

```
$q="INSERT INTO postings( houseID, posttext, postTitle) VALUES ('$houseID','$posttext','$postTitle')";
```

Whether or not the post is uploaded has to be validated

If there is an error with the information a user has entered then they will be taken to this page to re-navigate

Student Login

```php
<?php
if(isset($_COOKIE["nickname"]))
        {
                header("location: home.php");
        }
        else
        {
                header("location: directhouse.html");
        }
        /*checks if cookie has been set and redirects to set the cookie if it has not*/
?>
```

This is the first page the user will be taken to.

Sign In

nickname: [S   ]

house: [Air ▾]

[Submit]

If the user has no preset cookie they will be redirected to this page.

```html
<center><div class="login">
<body>
    <form method = "get" action = "directhouse.php">
        <fieldset>
        <div class= "loginbox">
            <p><label>nickname: <input type="int" name="nickname" size="20" maxlength="50" /> </label></p>
        </div>
        <div class= "loginbox">
            <p><center><label>house: <select name="house">  <option value="1">Air</option>
            <option value="2">Fire</option>  <option value="3">Earth</option> <option value="4">Water</option></select></label></center></p>
        </div>

        </fieldset>
        <p align="center"><input type="Submit" name="submit" value="Submit"/></p>
    </form>
</body>
</div>
<!--Allows user to input the values for their cookies-->
</body>
:/html>
```

This is the code for the drop down box

```php
//Contains the variables from the earlier GET function in the login form from the cookie
    DEFINE('DB_USER','root');
    DEFINE('DB_PASSWORD','');
    DEFINE('DB_HOST','localhost');
    DEFINE('DB_NAME','housewebsites');

    $nickname = $_REQUEST['nickname'];
    $house = $_REQUEST['house'];

    setcookie('nickname', $nickname, time() + (86400 * 30), "/");
    setcookie('house',$house, time() + (86400 * 30), "/");
    //sets the cookie for the user
    header("location: index.php");

    //connects database
```
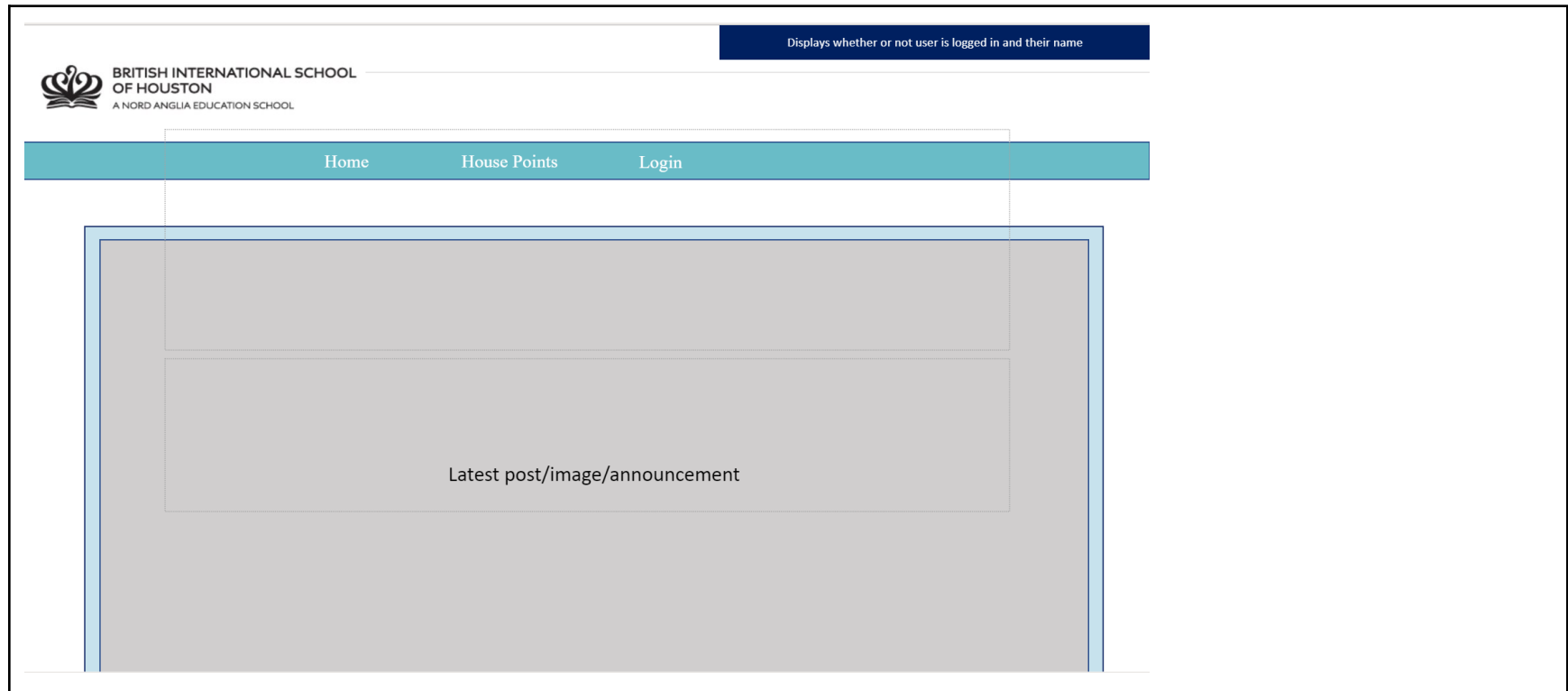
This code retrieves the data from the input boxes and sets them as cookies

House Announcements

Displays whether or not user is logged in and their name

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Home   House Points   Login

Latest post/image/announcement

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House Anounncements

not you?

REAL POST

Stimbky

2021-03-01 09:54:20

Poosfksk

posting posting posssting posting

2021-02-01 12:52:22

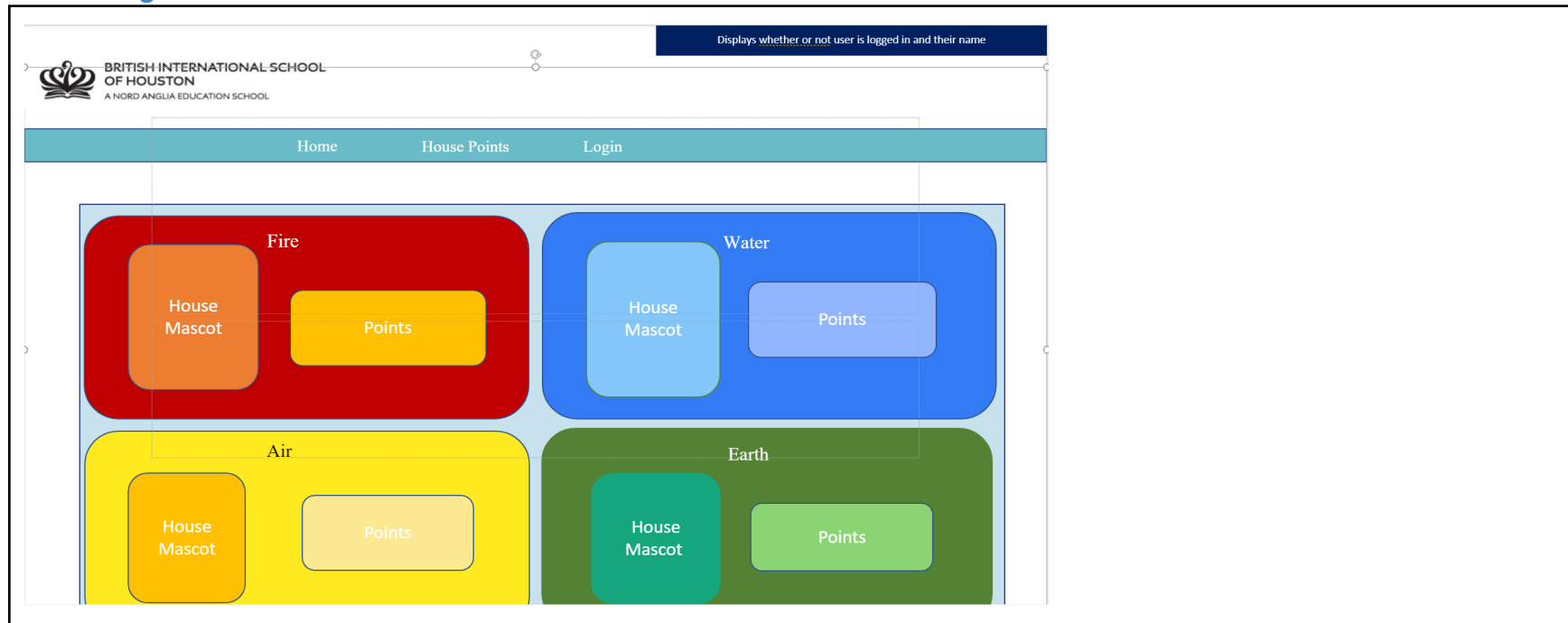This is the page the user will be directed to if their cookie has been set

```
$q= "SELECT * FROM postings ORDER BY dateCreated DESC";
// Sql statement to select from the database postings and ordering the posts by date in descending order
```

This Sql statement selects the data from the postings database and displays it by the newest post added.

```php
while($row = mysqli_fetch_array($result, MYSQLI_ASSOC))
{
    ?><body>
    <center><div class = "post"><center>
    <center><h4><?php echo $row['postTitle'];?></h4></center>
    <center><p><?php echo $row['posttext'];?></p></center>
    <sub><?php echo $row['dateCreated'];?></sub>
    </div>
    </body>
<?php /*This outputs the post title, post text and date created*/?>
```

Echos the data from the posting database

Points Page

```
</head>

    <center><div class="login">
    <body>
        <form method = "get" action = "directhouse.php">
            <fieldset>
            <div class= "loginbox">
                <p><label>nickname: <input type="int" name="nickname" size="20" maxlength="50" /> </label></p>
            </div>
            <div class= "loginbox">
                <p><center><label>house: <select name="house">  <option value="1">Air</option>
                <option value="2">Fire</option>  <option value="3">Earth</option> <option value="4">Water</option></select></label></center></p>
            </div>

            </fieldset>
            <p align="center"><input type="Submit" name="submit" value="Submit"/></p>
        </form>
    </body>
    </div>
    <!--Allows user to input the values for their cookies-->
</html>
```

The elements are already sorted by Id number in descending order. In order to place the correct number of points in the correctly colored box. The inner HTML allowed me to place non-variable elements into the colored div boxes.

House Points

View Graph

Water	Air
66	145

Earth	Fire
79	275

```
<div class="colorboxes blue"id= water></div>

<div class="colorboxes yellow" id= air></div>
<div class="colorboxes green" id= earth></div>
<div class="colorboxes red" id= fire></div>

<?php//gives the different colored div boxes?>
```

```
{
    /*database connection*/
    $q = "SELECT SUM(numberOfPoints) AS totalPoints,houseName FROM housePoints, house WHERE house.houseID= housePoints.houseID GROUP BY house.houseID ORDER BY house.houseID DESC";
    /*sql Statment that sums the total number of points. Retrieves the info from the database Housepoints. Sorts the points by house ID in descending order*/
    $table = @mysqli_query($dbc,$q);
```

This sql statement sums the house points added from the week number and selects the house points data from the database. It groups the data by houseID

```
    echo "<table border=1>";
        if($table)
        {
                /* while there is a connection to the database*/
            echo '<script>';
            echo 'var housePoints = [';
            while($row = mysqli_fetch_array($table, MYSQLI_ASSOC))
            {

                echo $row ['totalPoints'].",";
            }


            echo '];document.getElementById("water").innerHTML="<center><h3> Water</h3><center><h5>" + housePoints[0] +"</h5>";';
            echo'document.getElementById("earth").innerHTML="<center><h3> Earth</h3><center><h5>" + housePoints[1] +"</h5>";';
            echo'document.getElementById("fire").innerHTML="<center><h3> Fire</h3><center><h5>" + housePoints[2] +"</h5S>";';
            echo'document.getElementById("air").innerHTML="<center><h3> Air</h3><center><h5>"+ housePoints[3] +"</h5>";';
            echo '</script>';
        }


    }

/*the javascript that takes the id from the div boxes and places html inside the statment to output the housepoints and the Title */
```
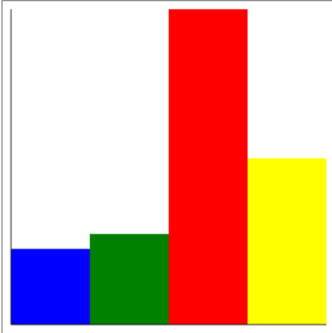
The javascript uses the id previously set in the html to place the number of house points into individual points boxes.

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House Graph

```php
        echo " var yValues = [";
    while($row = mysqli_fetch_array($result, MYSQLI_ASSOC))

        {
            echo $row['totalPoints'].",";
        }

        echo    "];";
?>
    var houseColors = ["blue","green","red","yellow"]
        var canvas = document.getElementById("myCanvas");
        var ctx = canvas.getContext("2d");

        ctx.moveTo(10,10);
        ctx.lineTo(10,390);

        ctx.moveTo(10,390);
        ctx.lineTo(390,390);

    // sets color and set parameters for the graph

        var max=0;
    for (counter=0; counter<4; counter++)
    {
        if (yValues[counter]> max)
        {
            max= yValues[counter];

        }



    }

        var scale = 380/max;

        xpos = 10;


        for(x = 0; x<=3; x++)
        {
            ypos = 390-(yValues[x]*scale);
            ctx.fillStyle= houseColors[x];
            ctx.fillRect(xpos,ypos,95,yValues[x]*scale);
            xpos=xpos+95;
        }

    // draws and fills the color blocks

        ctx.stroke();
    }
</script>
```

The graph is drawn by the code done above.
This code takes the points data from the data to graphically display it as a barchart on click

Error Handling

```php
if ($r)
{
    echo "Post was Successful.";



}

else
{
    echo "Post error";
}
/*An error check the determines whether or not the post has been uploaded */
```

```php
if ($row['password'] == NULL)
{
    echo 'User ID and Password are Required';
}
// Ensures the user must enter a value
```

```php
// Ensures the user must enter a value

elseif ($row['password'] == $password)

// Validates password in the database is equal to the value entered
    {

        header("location: admin.php?houseID=".$row['houseID']);
    //if the password is valid the user is taken to the admin page


    }

else
{
    header("location: errormessage.html");
}
```

```php
$dbc =@mysqli_connect(DB_HOST, DB_USER, DB_PASSWORD, DB_NAME) OR die('Could not connect');
```

References

W3schools.com. 2021. *W3Schools Online Web Tutorials*. [online] Available at: <https://www.w3schools.com/> [Accessed 5 May 2021].

Ullman, L., 2012. *PHP for MySQL for Dynamic Web sites*. 4th ed. Peach Pit Press.