

Scouting

Programming and managing the scouting database is an important contribution to our team. It is a big commitment, but the benefits are endless. Scouting requires a lot of hours sitting in the stands observing other competitors. Six scouters and a strategist are required in the stands at all times, when the matches are being played. Each scouter is responsible for observing one robot during each match, to determine their strengths and weaknesses. This information is then entered into our scouting database; which will be discussed in further detail below.

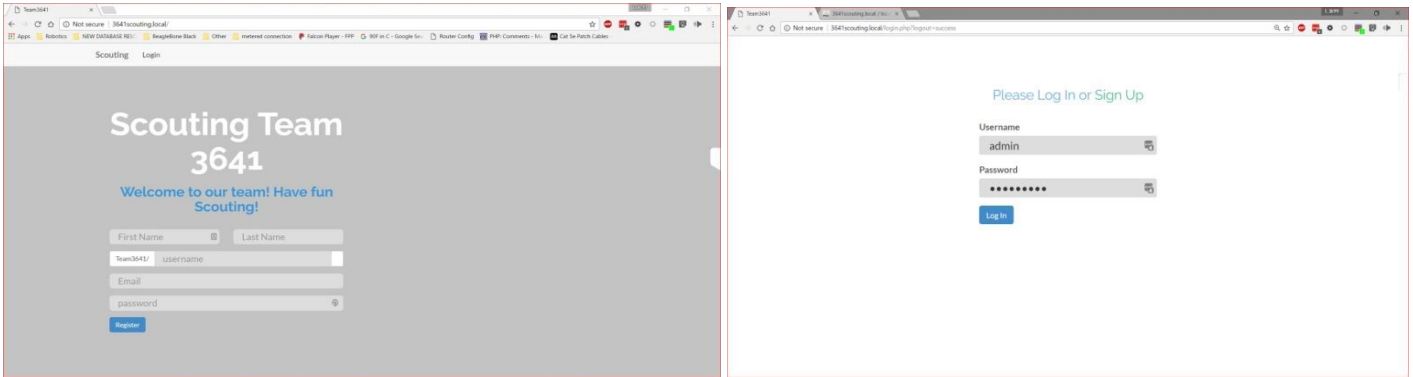
Scouting Database

First, I programmed the core of the database. In this case, all of the different variables had to be entered to get the precise values needed to create match predictions and driver strategy sheets later on. Then, I had to make the user interface. I started with a user login base, so the users would have to sign up and login, in order to access the database. I programmed this user interface in basic html, php, javascript, and css, for the layout and design of the database.

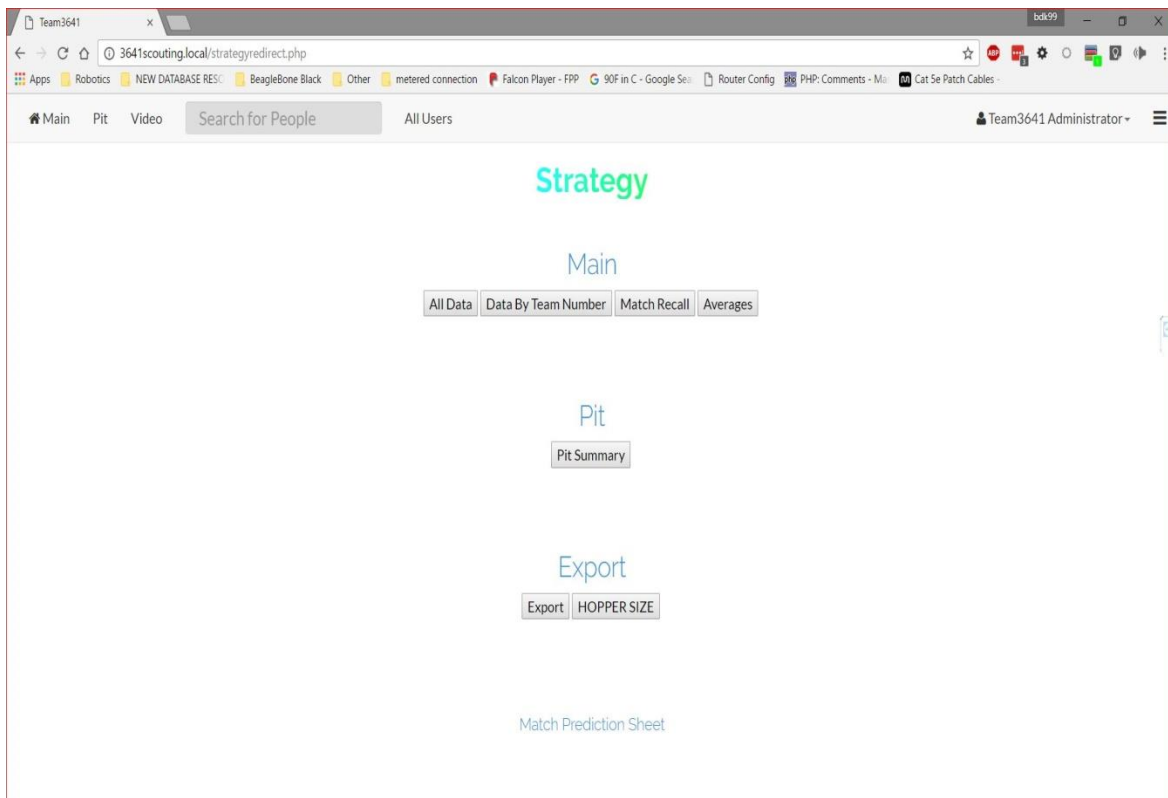
In doing this, I would later be able to determine the time that each scouter spent scouting, to insure they have met the requirements determined by the team. Each student is required to scout for a minimum of ten hours, as to share the responsibility with all members of the team. This requirement is waived for some students who are on the drive team, chairmans, or involved in some other aspect of the team that limits there opportunity to spend time scouting in the stands. This is left up to the coach's discretion.

Scouter User Interface

The picture shown on the left is the scouter sign up page. The picture shown on the right is the login page. To sign up, each user would use their first name, last name, a username of their choice, their email, and a password for security.



The strategy page shown below, was created so we could quickly get an export of the data into excel or libreoffice strategy sheet. This is to get a predictive score of our upcoming matches. It was also created to quickly check each match to see if there were problems with data entry. In addition, we could verify that scouters don't accidentally scout the same team during the same match.

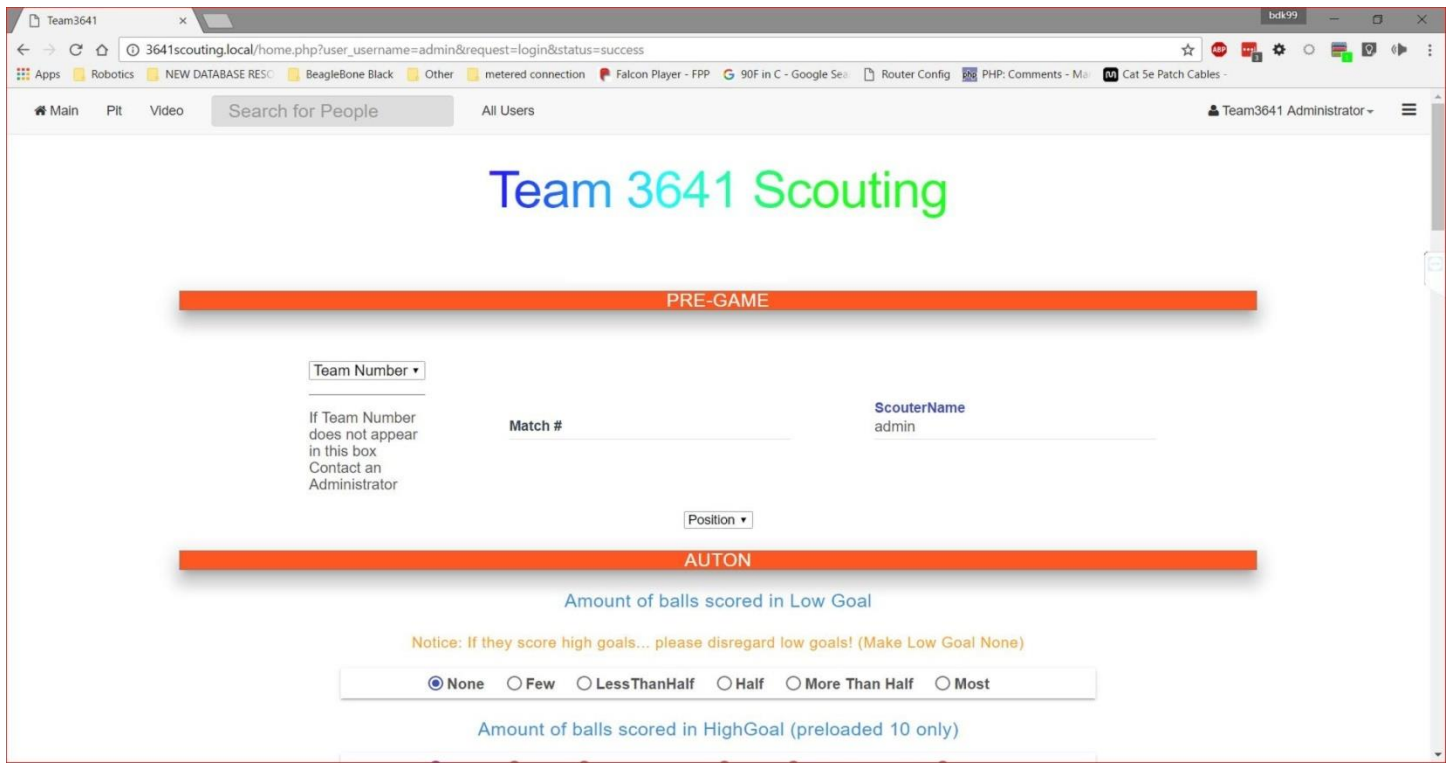


User Profile:

The picture below is information that the scouter completed, which is displayed on their user profile. This information includes the number of matches they scouted, how many pit scouts they completed, and tallies their total scouting time. This insures the responsibility is shared among team members, so scouters can get a break throughout the long day in the stands. This information is also used to determine who meets the requirements to earn their Varsity Letter at the end of the season. The profile display for most users shows the number of matches, the number of pit scouts, the users first and last name, their username, and gender. Privileged users can view all non-privileged users' information including their email, which is collected for security purposes only and is not used to promote ads or spam.

The screenshot displays a user profile for Sara Brooks. At the top, the name "SARA BROOKS" is shown in large, bold letters, with "(AKA: SARAB)" underneath. Below this, the role "DRIVE TEAM" is listed. A series of statistics are presented: "Time Scouted: 5.3 Hours", "Matches Scouted: 14", "Pit Scout Entries: 0", "Pit Scouts: 32", and "Extras:". A "Details" link is visible below the statistics. The profile is organized into three main sections: "BASIC", "PERSONAL", and "SOCIAL". The "BASIC" section shows the name "Sara Brooks" and a "BIO" field. The "PERSONAL" section shows "GENDER: Female" and "DATE OF BIRTH". The "SOCIAL" section is currently empty. There are also icons for "EMAIL" and "GENDER" in the bottom left corner.

i BASIC		i PERSONAL		i SOCIAL	
i BIO	Sara Brooks	👤 GENDER	Female		
✉ EMAIL		📅 DATE OF BIRTH			



The illustration shown above depicts the scouter entry page where a scouter would enter the data from the robot they scouted during a match. This information is important because it's what we use in the strategy spreadsheet, in order to do match predictions and later on. The information that our team must have in order to do match predictions is required to the ordinary user. To a user with higher privileges, the information is not required, but used for development purposes only.

Spreadsheet

This is where data goes when copied and pasted from the downloaded file acquired from the User Interface (UI) part of the database, shown above. The data then gets re-sorted and calculated in the data sheet. It is then moved to the calculation sheet, where even more calculations are performed on the raw imported data in order to then pull it into the strategy sheet. This is where the match predictions with the strategy team are done.

Raw Data Import:

Screenshot of LibreOffice Calc showing a raw data import spreadsheet. The spreadsheet has columns labeled A through O, with rows of data below. The data includes team numbers, scouter names, and various scores. Large text 'Page 1', 'Page 2', and 'Page 3' are overlaid on the grid.

Data from Import sheet rearranged:

Screenshot of LibreOffice Calc showing rearranged data from the import sheet. The spreadsheet has columns labeled B through V, with a detailed header row and many rows of numerical data. Large text 'Page 1', 'Page 2', and 'Page 3' are overlaid on the grid.

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1																					
2	Insert Data from Scouting below																				
3																					
4																					
5																					
6	Team No.	Auton Baseline	Auton Gear Score	Auton Fuel Score Low	Auton Fuel Score High	Auton Fuel Cycles	Auton Fuel Score High	TeleOp Fuel Hopper	TeleOp Gears Missed	TeleOp Shooter Score	TeleOp Fuel Score High	TeleOp Fuel Score Low	Defensive Skill	Defensive Advantage Skill	Ground Ball Pick-up	Driver Skill	Climb	Hopper Loading	Gear Floor Pick-up	Gear Load Station Pick-up	Shooting Cycle Co
7	0-9999	0.1	0.1,2	0.1,2,3,4,5	0.1,2		0.1,2,3,4	0-12	0-12	0.1,2,3,4	0.1,2,3,4,5	0.1,2,3,4	0.1,2,3,4	0.1,2,3,4	0,1,	0.1,2,3,4	0.1,2	0.1	0,1	0.1	0-9
8	27	0.9091	1	0	1	4.125	1.909090909	0.0909	3.00	4.2	0	0	3	3.125	0.8182	2	2	0.818181818	0	0.818181818	1
9	66	0.3333	1	0	1	0	0	0	2.89	0	0	0	3.5	2.6667	0.6667	2	2	0.555555556	0	0.888888889	1
10	74	0.7778	0.5	0	1	0	0	0	4.22	0	0	2	2.5714	0.6667	0.5	1.8	0.8	0.3	0.8	0	1
11	141	0.9	1	0	1	5	2.0	2.00	5	0	0	3	2.75	0.5	1.8	0.8	0.8	0.3	0.8	0	1
12	226	1	1	0	1	2	0.111111111	0.3333	2.89	1	0	0	3.25	0.8889	1.777777778	1.777777778	0.555555556	0	1	0	1
13	314	0.8333	1	0	1	4	3.333333333	0.3333	2.17	9	0	3.5	2.5	0.6667	0.2	0.666666667	0.5	0.833333333	0.5	0.833333333	1
14	503	0.5	1	0	1	3.4	0.75	0.0833	3.25	2.6667	0	2.75	3	0.5	2	0.5	0.666666667	0.666666667	0.666666667	0.666666667	1
15	1189	0.8571	1	5	1	4.5	0	0.1429	2.71	0	5	2	2.6667	0.3857	1.428571429	1.428571429	0.285714286	0	1	0	1
16	1243	0.6667	1	0	1	1	0	0	3.00	0	0	2	2.1667	0.1111	1.333333333	1.333333333	0.111111111	0	1	0	1
17	1481	0.9091	1	3	1	0	0	0	3.45	1	3	3	3.2857	0.9091	1.727272727	1.727272727	0.181818182	0.090909091	1	0	1
18	2075	1	1	0	1	4	0	0.2	3.50	0	0	0	0	2.4	0.2	1.8	1.8	0.2	0.6	0.8	1
19	2137	0.7273	1	0	1	3.25	0.272727273	0.0909	2.36	4	0	3	3	0.5455	1.909090909	1.909090909	0.545454545	0.454545455	0.909090909	0.909090909	1
20	2632	0.8	1	0	1	0	0	0.5	3.00	0	0	3.5	2.8571	0.5	2	0.3	0	0	1	0	1
21	2767	0.625	0	0	1	4	3.625	0	0.63	4.8182	0	3.3333	3.3333	0.625	1.75	0.875	0.75	0.125	0.125	0.125	3
22	2771	0.8571	1	0	1	0	0	0.1429	3.14	0	0	0	2.6667	0.4286	1.2	2	0.428571429	0.142857143	0.142857143	0.142857143	1
23	3357	0.8	1	0	1	3.5	1.5	0.4	2.00	6	0	2.3333	2.3333	0.7	1.8	1.8	1	0.7	0.8	0.7	1
24	3452	0.7	1	0	1	2.5	0	0.2	3.40	0	0	2	2.4286	0.4545	1.9	1.9	0.4	0.5	0.9	0.5	1
25	3539	0.8	1	2	1	4	0.7	0	2.60	3.5	2	3	2.3333	0.6	1.7	1.7	0.6	0	1	0	1
26	3546	0.9	1	0	1	0	0	0.1	3.60	0	0	3	3.4	0	2	2	0	0.8	0.7	0.8	1
27	3572	0.3333	1	0	1	5	0	0.2222	2.33	0	0	2.3333	2.5714	0.5556	1.777777778	1.777777778	0.222222222	0.555555556	0.777777778	0.777777778	1
28	3604	0.5833	1	0	1	0	0	0	3.08	0	0	2.3333	2.75	0.25	1.5	1.5	0.25	0	1	0	1
29	3620	0.8889	1	0	1	3	0	0	3.44	0	0	3	3	0.1111	1.888888889	1.888888889	0.222222222	0.111111111	1	1	1
30	3641	0.56	1	0	1	0	0	0.2	3.00	4	0	3.75	2.875	0.7	1.2	1.2	0.7	0.9	0.5	0.5	1
31	3656	0.5556	1	0	1	0	0	0	2.33	0	0	2	2.5	0.3333	1.666666667	1.666666667	0.444444444	0.333333333	0.777777778	0.777777778	1
32	3767	0.7273	1	0	1	0	0	0.1818	3.00	0	0	2.5	2.625	0.3636	1.181818182	1.181818182	0.272727273	0.090909091	1	1	
33	4377	1	1	0	1	0	0	0	2.27	0	0	2	2.4286	0.4545	2	2	0.363636364	0	1	0	1
34	4961	0.625	1	0	1	0	0	0.25	3.00	0	0	1.5	2.2857	0.125	1.75	1.75	0	0	1	0	1
35	4970	0.8	1	0	1	0	0	0.4	3.10	0	0	2	2.6667	0	2	2	0	0	1	0	1
36	5114	0.7778	1	0	1	3	0	0	3.22	0	0	2	2.8333	0	2	2	0	0	1	0	1
37	5144	0.6667	1	0	1	0	0	0.1111	2.44	0	0	2	2.1667	0.5556	1.555555556	1.555555556	0.111111111	0	1	0	1
38	5204	0.6667	1	0	1	0	0	0	2.78	0	0	2.5	2.375	0.188888889	1.888888889	1.888888889	0	0	1	0	1
39	5460	0.625	1	0	1	3.333333333	1.625	0	2.13	2.25	0	2	2.6	0.375	1.875	1.875	0.625	0.375	0.625	0.625	1

Rounded Calculations and Partial Predictions: The data from the data sheet is pulled into the calculations sheet, where all of the calculations are pulled in and this is where the predictive sheet starts.

The screenshot shows a spreadsheet with columns A through AA. The data is organized into sections for Blue Alliance (rows 3-13) and Red Alliance (rows 14-24). Each team's performance is tracked across various metrics such as Auton Score, Fuel Score, Hopper Cycles, and Hopper Size. The spreadsheet includes formulas and calculated values for each team's performance.

Strategy Sheet: This is where our predictive program helps us create our driver strategy sheet. As you can see, when attack has a “YES” in the box, you need to put either a G, or an S in the row, matching the column “G or S”. This is to eliminate calculating a robot for both shooting fuel and putting gears on the airship when they can only do one or the other during the match.

The screenshot shows a strategy sheet with columns A through AF. It is divided into sections for Blue Alliance (rows 1-10) and Red Alliance (rows 11-20). Each team's strategy is based on their performance metrics and a 'Choose Attack' column with 'G' or 'S' options. The sheet also displays 'Project Match Based on Averages' for each team, including Baseline, Auton Rotor, Auton KPA, Tele-Op Kpa, Tele-Op Gear, Climb, Match, and Ranking Points.

Driver Strategy Sheet: The driver strategy sheet is given to the drive team to tell them what the strategy team determined is the best strategy to be played for that match.

The screenshot shows a LibreOffice Calc spreadsheet with the following content:

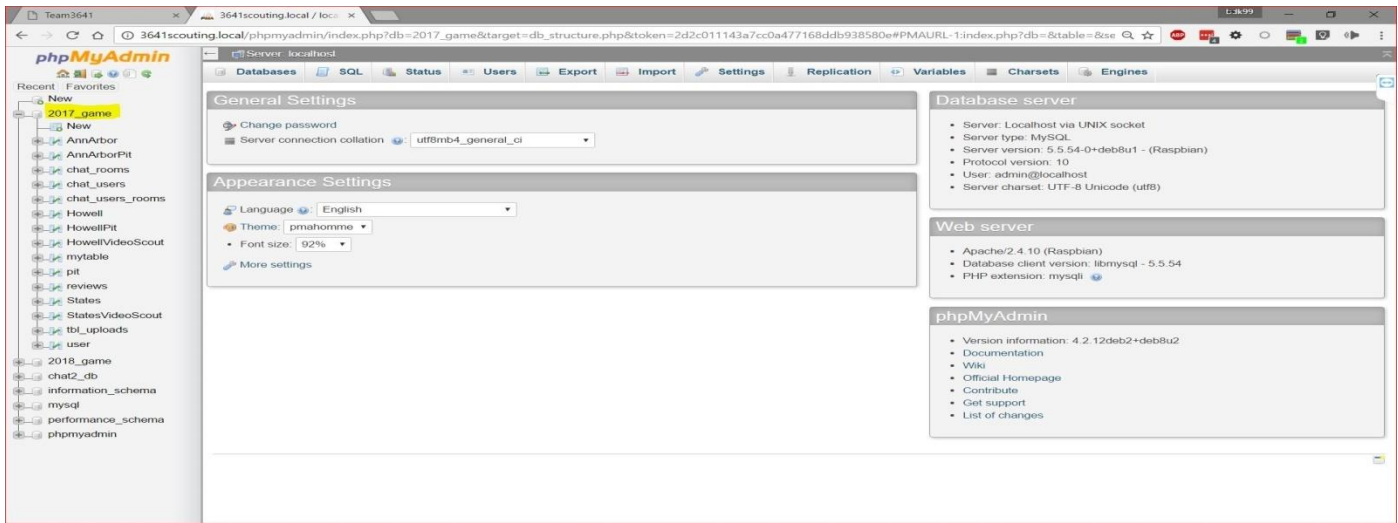
- Match Information:** Match Number: Q74, RED RP: 3, BLUE RP: 0, Match Points: 357 (RED), 316 (BLUE).
- Robot Specifications Table:**

Robot	Baseline	T Fuel	T Gears	O Climb	Pilot
R1 6020	YES	0	3	YES	PILOT
R2 3641	YES	0	3	YES	PILOT
R3 6097	YES	0	3	YES	PILOT
B1 3452	YES	0	3	YES	PILOT
B2 2137	YES	21	2	YES	PILOT
B3 5144	YES	0	2	YES	PILOT
- Field Diagram:** A diagram of the field with zones: Launchpad, Neutral Zone, and Launchpad. It shows fuel stations (70 Fuel, 10 Fuel), alliance stations, overflow lines, and a rotor.
- Meme Images:** Several meme images are scattered across the spreadsheet, including:
 - "ONLY TWO PEOPLE HAVE EVER UNDERSTOOD THE THEORY OF RELATIVITY, EINSTEIN AND ETHAN."
 - "FIRST STEAMWORKS... THE GAME THAT TEACHES US IT'S OK TO SPILL FUEL IN OUR ENVIRONMENT... FOR COMPETITIVE ADVANTAGE."
 - "ONE DOES NOT SIMPLY BUILD A ROBOT IN THREE DAYS"
 - "WHEN YOU'RE AUTONOMOUS, BUT LINES ARE RIGHT"
 - "HEAT" (with a robot image)
 - "WELCOME TO STEAMWORKS"
 - "ROBOT DIDN'T WORK ALL MATCH"
 - "WHEN IT'S BAG DAY"
- Notes:**
 - We are projected to win this match because we can just get 4 rotors
 - All robots are about equal on auton gear-- discuss with partners who feels they have the better chance
 - If we dont get four rotors this will be a dog fight
 - Talk with alliance partners and discuss how to get all four rotors

If you don't know how to use MYSQL in order to manage the database, that's okay! We have phpmyadmin installed on the server in order to make it easier for users to help manage the database. First, you're going to need a user account, which you can obtain by talking to someone that currently has permissions to edit users on the database. Next you type "3641scouting.local/phpmyadmin" into the browser URL without the quotation marks. This will take you to a login page where you will be able to login with your user account.

The two screenshots show the phpMyAdmin login interface:

- Left Screenshot:** Shows the default login page with a "Language" dropdown set to "English", and "Username:" and "Password:" input fields. A "Go" button is at the bottom right.
- Right Screenshot:** Shows the same login page, but the "Username:" field contains the text "root".



After clicking the database that you are using, you should see something like the picture below. This is where you can browse, search, insert, empty or drop the table that we are currently using. While scouts are scouting, the active table is my table. This year, our team competed at Ann Arbor, Howell, and States in Saginaw, so you will see tables corresponding to the names of the competitions that we attended. This was not done by accident; the data in these tables have the entries from the database for those specific competitions to keep things organized. You will also see that there is a competition name with the word ‘Pit’ afterward. This is the pit entries for the competition that is specified before. There is also a table called “users”, which contains all of the user account information for the user login user interface. Without the data in the user table, users will not be able to login into the database.

