

G10 Project Document - Baseball 2019 Database

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1) Project Idea:

We have created a baseball database in which we have gathered data from baseball-reference.com based on the 2019 MLB season. Our data includes the player's name, team name, division name, league name, defensive position, batting average, homeruns, on base percentage, slugging percentage, innings pitched, earned run average, and games played. With this data we have created a database that allows the user to select a player, delete a player, update a player, and add a new player. This is done by linking our front end on Tkinter to our back end on SQLite3. Performing any of our operations on the front end will automatically update the database on the back end.

2) User Requirements:

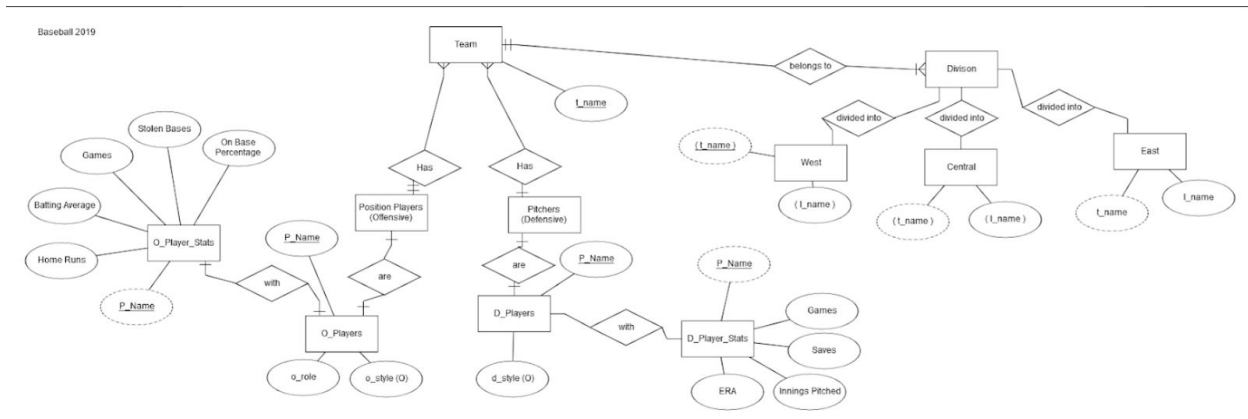
Must Have: Operations that are necessary for our database to perform its main function include; selecting a player, adding a player, and updating a player

Should Have: Operations that are not necessary but should be included in our database include; deleting a player and searching for players of similar performance

Could Have: Operations that could be added into our database include; updating a team name and deleting a team.

Won't Have: Operations that will not be included into our database include; adding teams or players outside of the MLB, adding data for more than one season, advanced statistics, and coaching/front office data.

3) ERD:



4) Data Sources:

<https://www.foxsports.com/mlb/stats?season=2019&category=BATTING&group=1&time=2>

5) SQL Queries:

```
3
4  -- tables
5  -- Table: League
6  ● ○ CREATE TABLE League (
7      l_name VARCHAR(50) NOT NULL,
8      Division VARCHAR(50) NOT NULL,
9      l_id INT NOT NULL,
10     CONSTRAINT League_pk PRIMARY KEY (l_id)
11 );
12
13  -- Table: Players
14  ● ○ CREATE TABLE Players (
15     p_id int NOT NULL,
16     p_name varchar(50) NOT NULL,
17     Team_t_id int NOT NULL,
18     Team_t_name varchar(50) NOT NULL,
19     CONSTRAINT Players_pk PRIMARY KEY (p_id,p_name)
20 );
21
22  -- Table: Team
23  ● ○ CREATE TABLE Team (
24     t_id int NOT NULL,
25     t_name varchar(50) NOT NULL,
26     League_l_id int NOT NULL,
27     CONSTRAINT Team_pk PRIMARY KEY (t_id,t_name)
28 );
```

```

29
30 -- Table: defensive
31 ● CREATE TABLE defensive (
32     d_role varchar(2) NOT NULL,
33     innings decimal(2,2) NOT NULL,
34     games int NOT NULL,
35     era decimal(4,4) NOT NULL,
36     Players_p_id int NOT NULL,
37     Players_p_name varchar(50) NOT NULL,
38     CONSTRAINT defensive_pk PRIMARY KEY (Players_p_id,Players_p_name)
39 );
40
41 -- Table: offensive
42 ● CREATE TABLE offensive (
43     o_role varchar(2) NOT NULL,
44     games int NOT NULL,
45     batting_avg decimal(3,3) NOT NULL,
46     hr int NOT NULL,
47     on_base decimal(3,3) NOT NULL,
48     slg decimal(3,3) NOT NULL,
49     ops decimal(4,4) NOT NULL,
50     Players_p_id int NOT NULL,
51     Players_p_name varchar(50) NOT NULL,
52     CONSTRAINT o_role PRIMARY KEY (Players_p_id,Players_p_name)
53 );
54
55 -- DELETION
56
57 -- Delete Table: Defensive
58 ● DELETE from defensive;
59
60 -- Delete Tuples: Offensive
61 ● DELETE from offensive;
62
63 -- DROP
64
65 -- Drop Table: Defensive
66 ● DROP Table defensive;
67
68 -- Drop Table: Offensive
69 ● DROP Table offensive;
70
71 -- ALTER
72
73 -- Alter Table: Defensive
74 ● ALTER Table defensive drop games;
75
76 -- Alter Table: Offensive
77 ● ALTER Table offensive drop hr;
78

```

6) Indexes:

Name	Type	Schema
▼ Tables (1)		
▶ players		CREATE TABLE "players" ("p_id" text, "p_name" text, "Team_t_id" text, "Team_t_name" text)
▼ Indices (2)		
▶ playerView		CREATE INDEX playerView ON players(p_id)
▶ playernName		CREATE INDEX playernName ON players(p_name)
Views (0)		
Triggers (0)		

7)Views:

```

79  -- VIEW
80
81  -- View: Defensive
82  • create view pitching as
83    select innings, era
84    from defensive;
85
86  -- View: Offensive
87  • create view hitting as
88    select batting_avg, on_base, slg, ops
89    from offensive;

```

	p_id	p_name	Team_t_id	Team_t_name
	Filter	Filter	Filter	Filter
1	4	Johnny Tan	2	Boston Red Socks
2	1	Joey Nguyen	2	Boston Red Socks
3	2	Jordan Coats	1	New York Yankees
4	3	Alex Rodriguez	1	New York Yankees
5	5	David Ortiz	2	Boston Red Socks

PlayerName	League	Division	TeamName	Pid	DRole	Innings	Games	ERA	ID
Nick Anderson	AL	East	Tampa Bay Rays	14	RP	5.2	4	1.59	1
Diego Castillo	AL	East	Tampa Bay Rays	15	RP	5.2	4	0	2
Oliver Drake	AL	East	Tampa Bay Rays	16	RP	3	2	6	3
Tyler Glasnow	AL	East	Tampa Bay Rays	17	SP	7	2	7.71	4
Brendan McKay	AL	East	Tampa Bay Rays	18	SP	1.1	3	0	5
Charlie Morton	AL	East	Tampa Bay Rays	19	SP	10	2	0.9	6
Emilio Pagan	AL	East	Tampa Bay Rays	20	RP	3	4	6	7
Colin Poche	AL	East	Tampa Bay Rays	21	RP	4.1	5	2.08	8
Chaz Roe	AL	East	Tampa Bay Rays	22	RP	2.2	3	6.75	9
Blake Snell	AL	East	Tampa Bay Rays	23	SP	5.1	3	1.69	10
Ryan Yarbrough	AL	East	Tampa Bay Rays	24	RP	3	3	0	11
Jake Diekman	AL	West	Oakland Athletics	12	RP	0.1	1	0	12
Laim Hendriks	AL	West	Oakland Athletics	13	RP	1	1	0	13
Jesus Luzardo	AL	West	Oakland Athletics	14	RP	3	1	0	14
Sean Manaea	AL	West	Oakland Athletics	15	SP	2	1	18	15

PlayerName	League	Division	TeamName	ORole	Pid	Games	BattingAvg	HR	OnBase	SLG	OPS	ID
Josh Donaldson	NL	East	Atlanta Braves	3B	4	5	.158	1	.273	.368	.641	1
Adam Duvall	NL	East	Atlanta Braves	LF	5	5	.273	1	.333	.545	.878	2
Tyler Flowers	NL	East	Atlanta Braves	C	6	2	1.000	0	1.000	1.000	2.000	3
Freddie Freeman	NL	East	Atlanta Braves	1B	7	5	.200	1	.273	.400	.673	4
Billy Hamilton	NL	East	Atlanta Braves	CF	8	2	.000	0	1.000	.000	1.000	5
Adeint Hechavarria	NL	East	Atlanta Braves	SS	9	3	.000	0	.000	.000	.000	6
Matt Joyce	NL	East	Atlanta Braves	RF	10	5	.100	0	.182	.100	.282	7
Nick Markakis	NL	East	Atlanta Braves	LF	11	5	.143	0	.182	.190	.372	8
Brian McCann	NL	East	Atlanta Braves	C	12	5	.188	0	.235	.250	.485	9
Rafael Ortega	NL	East	Atlanta Braves	LF	13	4	.000	0	.000	.000	.000	10
Dansby Swanson	NL	East	Atlanta Braves	SS	14	5	.389	2	.421	.556	.977	11
Matt Beatty	NL	West	Los Angeles Dodgers	LF	1	4	.375	0	.375	.375	.750	12
Cody Bellinger	NL	West	Los Angeles Dodgers	1B	2	5	.211	0	.286	.263	.549	13
David Freese	NL	West	Los Angeles Dodgers	1B	3	4	.500	0	.500	.625	1.125	14
Kike Hernandez	NL	West	Los Angeles Dodgers	LF	4	3	.429	1	.500	1.00	1.500	15

8) Description of Technology:

For our GUI implementation we used Tkinter which is the standard Python interface to the Tk GUI toolkit. We also connected SQLite to Tkinter as it was easier to use with a smaller database.

