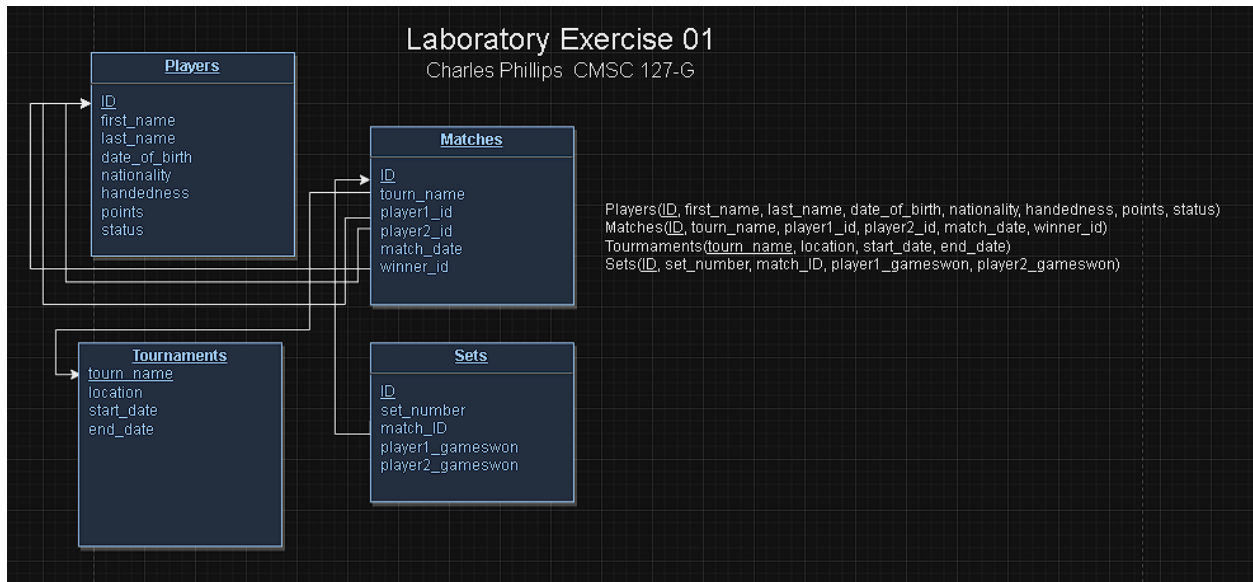


Technical Documentation

NAME OF DATABASE: TENNIS



My database consists of four tables named Players, Matches, Tournaments, and Sets. I created this database to store information about tennis players and the matches they play, similar to the website (<https://www.atptour.com/en/>) albeit a much simpler version.

PLAYERS TABLE

```
MariaDB [tennis]> select * from players;
```

id	first_name	last_name	date_of_birth	nationality	handedness	points	status
1	Carlos	Alcaraz	2003-05-05	Spanish	R	2400	Active
2	Novak	Djokovic	1987-05-22	Serbian	R	2000	Active
3	Jannik	Sinner	2010-07-28	Italian	R	2160	Active
4	Holger	Rune	2003-04-19	Danish	R	3200	Active
5	Daniil	Medvedev	1996-02-11	Russian	L	2720	Active
6	Casper	Ruud	1998-12-22	Norwegian	R	2720	Active
7	Denis	Shapovalov	1999-04-15	Canadian	L	1440	Active
8	Rafael	Nadal	1986-06-03	Spanish	L	1920	Active

8 rows in set (0.000 sec)

```
MariaDB [tennis]> describe players;
```

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
first_name	varchar(20)	YES		NULL	
last_name	varchar(20)	YES		NULL	
date_of_birth	date	YES		NULL	
nationality	varchar(20)	YES		NULL	
handedness	varchar(5)	YES		NULL	
points	int(11)	YES		NULL	
status	varchar(20)	YES		Active	

8 rows in set (0.014 sec)

In my 'players' table, I set a Attribute 'id' with auto increment to be the unique identifier for each player in my database. I set other Attributes to help describe these players but taking into the account that it is possible for two players to be completely similar in all aspects which is why the 'id' exists. I then set initial points for each player, calculated by me from tournament placings in the 'matches' table. In my UI, this calculation will be automatic for any additional or removed tournaments from the database. The last Attribute is 'status' which determines if a player is active or retired, wherein if they are retired, their points are set to 0, they are removed from rankings (in UI), and they cannot participate in further tournaments.

TOURNAMENTS TABLE

```
MariaDB [tennis]> select * from tournaments;
```

tourn_name	location	start_date	end_date
AO	Australia	2023-11-18	2023-11-20
French Open	France	2023-11-21	2023-11-23
US Open	United States	2023-09-01	2023-09-03
Wimbledon	United Kingdom	2023-07-01	2023-07-03

```
4 rows in set (0.001 sec)
```

```
MariaDB [tennis]> describe tournaments;
```

Field	Type	Null	Key	Default	Extra
tourn_name	varchar(20)	NO	PRI	NULL	
location	varchar(20)	YES		NULL	
start_date	date	YES		NULL	
end_date	date	YES		NULL	

```
4 rows in set (0.016 sec)
```

Now, in my tournaments table, I set a Attribute 'tourn_name' to represent the unique name of each tournament that the players played in. Once a tournament is completed, they can no longer compete in it, as my database is supposed to represent the occurrence of tournaments over a single year only. Also, in the ATP Tour, no two tournaments share the same name and is why I allowed the name to be the primary key. The location Attribute has the country that the tournament takes place in, and the start and end dates occur over a period of three days, as there are three matches per tournament.

MATCHES TABLE

```
MariaDB [tennis]> select * from matches;
```

id	tourn_name	player1_id	player2_id	match_date	winner_id
1	AO	1	7	2023-11-18	1
2	AO	2	5	2023-11-19	2
3	AO	1	2	2023-11-20	2
4	French Open	3	4	2023-11-21	4
5	French Open	5	8	2023-11-22	5
6	French Open	4	5	2023-11-23	5
7	Wimbledon	6	7	2023-07-01	6
8	Wimbledon	3	8	2023-07-02	8
9	Wimbledon	6	8	2023-07-03	6
10	US Open	1	3	2023-09-01	1
11	US Open	4	6	2023-09-02	4
12	US Open	1	4	2023-09-03	4

```
12 rows in set (0.001 sec)
```

```
MariaDB [tennis]> describe matches;
```

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
tourn_name	varchar(20)	YES	MUL	NULL	
player1_id	int(11)	YES	MUL	NULL	
player2_id	int(11)	YES	MUL	NULL	
match_date	date	YES		NULL	
winner_id	int(11)	YES	MUL	NULL	

```
6 rows in set (0.015 sec)
```

My 'matches' table contains all the matches that have been played across all available tournaments. The Attribute 'id' with auto increment holds the identification for unique matches and the Attribute 'tourn_name' is a foreign key that references 'tourn_name' primary key in the 'tournaments' table. I then have three foreign keys, namely, 'player1_id', 'player2_id', and 'winner_id' that reference 'id', the primary key of the 'players' table. This represents the two players playing against each other in the match and the winner of that match. For each tournament, there are three matches, two semi-final matches and one final match. The winners of the first two matches face off in the final match and the winner of the final match wins the tournaments. The points system that make up the ranking in my UI are generated from player performances across all tournaments that they play. If a player exists within a tournament they get 720 points. If they reach the last match, they get 480 additional points. The winner of the last match gets an additional 800 points. The dates also reflect the three day period that the tournament takes place.

SETS TABLE

```
MariaDB [tennis]> select * from sets;
```

id	set_number	match_ID	player1_gameswon	player2_gameswon
1	1	1	6	3
2	2	1	6	3
3	1	2	6	4
4	2	2	4	6
5	3	2	6	3
6	1	3	6	4
7	2	3	3	6
8	3	3	5	7
9	1	4	2	6
10	2	4	5	7
11	1	5	6	3
12	2	5	7	5
13	1	6	6	4
14	2	6	3	6
15	3	6	6	7
16	1	7	6	4
17	2	7	6	8
18	1	8	1	6
19	2	8	3	6
20	1	9	7	6
21	2	9	6	7
22	3	9	6	4
23	1	10	7	6
24	2	10	6	3
25	1	11	6	3
26	2	11	3	3
27	3	11	6	4
28	1	12	6	3
29	2	12	8	6
30	3	12	6	1

30 rows in set (0.001 sec)

```
MariaDB [tennis]> describe sets;
```

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
set_number	int(11)	YES		NULL	
match_ID	int(11)	YES	MUL	NULL	
player1_gameswon	int(11)	YES		NULL	
player2_gameswon	int(11)	YES		NULL	

5 rows in set (0.015 sec)

The 'sets' table contains all the sets played in every tennis match. These initial sets were generated by me, but in the UI, when a tournament is created, all matches and sets will be randomly generated using algorithms I made. The Attribute 'id' with auto increment represents unique set identification, with individual set numbers in the next Attribute representing the placement of a set within a singular match, which can be either 2 or 3 sets long. Then, the foreign key 'match_ID' references the 'ID' in the 'matches' table, with the last two Attributes

representing the games won for each player in the specific set.

IMPLEMENTATION OF DATABASE UI



Go to Rankings

Go to Tournaments

Search for a player(Type Full Name, Go to Rankings for Reference):

 Search

Add New Player to ATP Tour

Update Player Information

Retire Player from ATP Tour

I chose HTML, CSS, Php, and JavaScript to implement my database UI. The ATP logo in the top left always redirects to the shown page and appears on all my



Tennis Player Rankings

Rankings	Name	Points	(Player ID)
1	Holger Rune	3200	4
2	Daniil Medvedev	2720	5
3	Casper Ruud	2720	6
4	Carlos Alcaraz	2400	1
5	Jannik Sinner	2160	3
6	Novak Djokovic	2000	2
7	Rafael Nadal	1920	8
8	Denis Shapovalov	1440	7

Retired Players

Name	Highest Rank
------	--------------

webpages. The first button, 'Go to Rankings',

redirects the user to 'rankings.php', which shows a table of players and their points in descending order, with an additional column to show the ranking. This also shows retired players and their highest ranking



Tournaments (Click on Them to see Matches)

Create Tournament

If you want your tournament to have a picture, save it under /images as a .jpg file with the same name as your tournament. If it has any spaces, put an underscore (_) instead. For example the tournament 'Us Open' has a .jpg named 'US_Open'.

Tournament Name Location (Select Country) Start Date mm/dd/yyyy

Delete Tournament

Tournament Name



Winner:

Djokovic

Start Date: 2023-11-18

End Date: 2023-11-20



Winner:

Medvedev

Start Date: 2023-11-21

End Date: 2023-11-23



Winner:

Raul

Start Date: 2023-07-01

End Date: 2023-07-03



Winner:

Rice

Start Date: 2023-08-01

End Date: 2023-08-03

sets within those matches. It will select 4 random players from all the active players available (which excludes retired players), and put them into three matches, where the winners of the first two will face off in a final match. The system that I used to initially calculate the points for the four existing tournaments is applied here and updates the rankings dynamically. This will also update the player page and the information there. One can also delete a tournament which will then do the opposite and remove all matches and sets under that tournament. Points will also be removed depending on how far a player got within that tournament. This corresponds to a real-life instance where points got removed from Wimbledon 2022 due to the tournament banning Russian and Belarusian players.



Go to Rankings

Go to Tournaments

Search for a player (Type Full Name, Go to Rankings for Reference):

Information about Carlos Alcaraz:



First Name	Last Name	Date of Birth	Nationality	Handedness	Points	Status
Carlos	Alcaraz	2003-05-05	Spanish	R	2400	Active

When a player is searched for, their entire row in the players table is shown, and then their results

AO

Match Date	Location	Score	Opponent	Result
2023-11-18	Australia	6 - 3	Denis Shapovalov	WIN
		6 - 3		
2023-11-20	Australia	6 - 4	Novak Djokovic	LOSS
		3 - 6		
		5 - 7		

US Open

Match Date	Location	Score	Opponent	Result
2023-09-01	United States	7 - 6	Jannik Sinner	WIN
		6 - 3		
2023-09-03	United States	3 - 6	Holger Rune	LOSS
		6 - 0		
		1 - 6		

Season Record:

Wins: 2, Losses: 2

Win/Loss Percentage: 50 %

Sets Won Percentage: 60 %

Games Won Percentage: 52.69 %

Head to Heads:

1 - 0 Denis Shapovalov

0 - 1 Novak Djokovic

1 - 0 Jannik Sinner

0 - 1 Holger Rune

Add New Player to ATP Tour

Update Player Information

Retire Player from ATP Tour

in each tournament per match. A result column was added to show whether the match was a win or a loss. This is updated whenever a tournament is created or deleted. Underneath that, their season record is shown, tallying their total wins and losses along with their winning percentage. As this is based on their wins and losses in the listed tournaments, this is also updated dynamically. Under that is their head-to-head records per player, showing how well they performed against their opponent.

New players can also be added to the database, letting the user determine all aspects of a player except 'points' and 'status'. Newly added players start with 0 points as they have not yet participated into any tournaments and 'status' is assumed to be 'Active' at first. After a player has been added, they are added to the list of players eligible for tournaments and have a chance to earn points.

Updating Information can be done to any player and on all attributes except 'id', 'points', and 'status'. Retired players can also be updated as it will not affect their results history. I decided that players cannot be traditionally deleted from the database but instead will be retired, setting their points to 0, not allowing them to partake in tournaments, removing them from rankings, and placing them in the 'retired' section under the rankings. Their highest ranking that they achieved during their career is displayed next to their name.