Queries

1. Which 3 teams have the most points during the 2018-2019 season?
2. How many goals did the Toronto Maple Leafs score at home this season (2018-19) versus away?
3. Who are the goalies with the highest save percentages?
4. Who is the oldest player on each team for the 2017-18?
5. When are all the Maple Leafs home games this season?
6. What are the names and teams of all defencemen?
7. What are the names of everyone affiliated with the Chicago Blackhawks during the 2017-18 season?
8. Who has won the Vezina Trophy the last 2 years?
9. Who are the head coaches for all the Eastern Conference teams?
10. What teams has David Kampf been associated with?

Relational Algebra

1. **Which 3 teams have the most points during the 2018-2019 season?**
   Not possible since various teams can have the same point total and we cannot limit the amount of teams in relational algebra.

2. **How many goals did the Toronto Maple Leafs score at home this season (2018-19) versus away?**
   Not possible in relational algebra because aggregation is required to calculate the score sums.

3. **Who are the goalies with the highest save percentages?**
   p(g1, goalie_statistics)
   p(g2, goalie_statistics)
   p(g3, $\pi_{g2.player\_name}(g1 \bowtie_{g1.save\_percentage > g2.save\_percentage} g2)$
   $(\pi_{player\_name}(g1)) - g3$

4. **Who is the oldest player on each team for the 2017-18?**
   Not possible in relational algebra because an aggregate function (MAX()) is required to identify the oldest player on each team.

5. **When are all the Maple Leafs home games this season?**
   $\pi_{date}(\sigma_{home\_team = \text{“Leafs”} \wedge season\_year = \text{“2017-18”}}(match))$

6. **What are the names and teams of all defencemen?**

   π- names, team -(σ-player_position = “defence” ^ player.hp_id = roster.hp_id-(roster $\bowtie$ player))

7. **What are the names of everyone affiliated with the Chicago Blackhawks during the 2017-18 season?**

   π -name, staff_name- (σ-works_for.hp_id = roster.hp_id ^ works_for[team_name] = roster[team_name] -(roster $\bowtie$ works_for))

8. **Who has won the Vezina Trophy the last 2 years?**

   Not possible in relational algebra because there aren’t operations to sort and limit results to the two most recent years.

9. **Who are the head coaches for all the Eastern Conference teams?**

   π staff_name -(σ-title=”head coach” ^ conference=”Eastern” ^ works_for.team_name = team.team_name-(works_for $\bowtie$ team))

10. **What teams has David Kampf been associated with?**

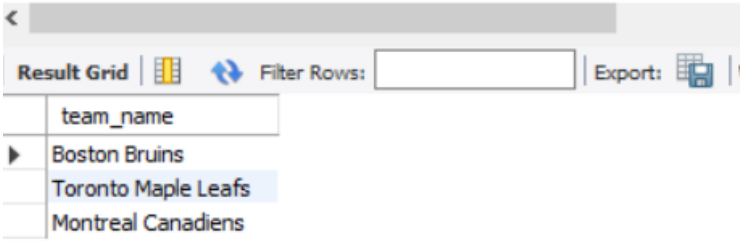
    π- team_name- (σ -player_name = “David Kampf”(roster))

SQL

1. Which 3 teams have the most points during the 2018-2019 season?

```
SELECT team_name FROM nhl.team_standing
WHERE season_year = '2018-19'
ORDER BY points DESC LIMIT 3;
```

```sql
SELECT team_name FROM nhl.team_standing
WHERE season_year = '2018-19'
ORDER BY points DESC LIMIT 3;
```



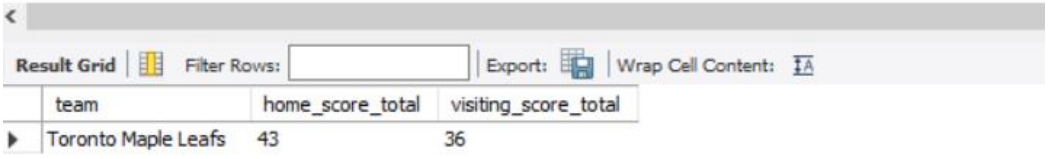
Result Grid | Filter Rows: | Export:

team_name
Boston Bruins
Toronto Maple Leafs
Montreal Canadiens

2. How many goals did the Toronto Maple Leafs score at home this season (2018-19) versus away?

```sql
WITH
  hscore AS
    (SELECT home_team AS team,
    sum(home_score) AS home_score_total
    FROM nhl.match
    WHERE home_team = 'Toronto Maple Leafs'
    AND season = '2018-19'),
  vscore AS
    (SELECT visiting_team AS team,
    sum(visiting_score) AS visiting_score_total
    FROM nhl.match
    WHERE visiting_team = 'Toronto Maple Leafs'
    AND season = '2018-19')
SELECT hscore.team, home_score_total, visiting_score_total FROM hscore
NATURAL JOIN vscore;
```

```sql
WITH
  hscore AS
    (SELECT home_team AS team,
    sum(home_score) AS home_score_total
    FROM nhl.match
    WHERE home_team = 'Toronto Maple Leafs'
    AND season = '2018-19'),
  vscore AS
    (SELECT visiting_team AS team,
    sum(visiting_score) AS visiting_score_total
    FROM nhl.match
    WHERE visiting_team = 'Toronto Maple Leafs'
    AND season = '2018-19')
SELECT hscore.team, home_score_total, visiting_score_total FROM hscore
NATURAL JOIN vscore;
```



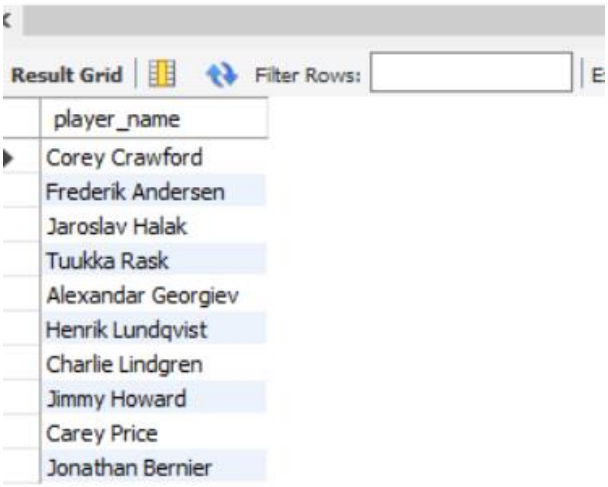
team	home_score_total	visiting_score_total
Toronto Maple Leafs	43	36

3. Who are the goalies with the highest save percentages?

The English-language query does not specify how many top goalies to return, nor for what season. Because these requirements were not specified, the query below returns all the goalies ranked by their best save percentage.

```sql
SELECT DISTINCT player_name
FROM nhl.goalie_stats
GROUP BY player_name
ORDER BY save_percentage DESC;
```

```sql
SELECT DISTINCT player_name
FROM nhl.goalie_stats
GROUP BY player_name
ORDER BY save_percentage DESC;
```



Result Grid | Filter Rows:

player_name
Corey Crawford
Frederik Andersen
Jaroslav Halak
Tuukka Rask
Alexandar Georgiev
Henrik Lundqvist
Charlie Lindgren
Jimmy Howard
Carey Price
Jonathan Bernier

4. Who is the oldest player on each team for the 2017-18 season?
For this query, a view of player names, teams and ages was created from the 2017-18 rosters and hockey_person info. Then a query was executed to get the oldest player on each team that season.

```sql
/*create a supporting view*/
DROP VIEW IF EXISTS ordta;

CREATE VIEW `ordta` AS
    SELECT
        roster.player_name AS `Name`,
        roster.team_name AS `Team`,
        hockey_person.age AS `Age`
    FROM
        (nhl.roster
        JOIN `hockey_person` ON ((roster.hp_id = hockey_person.hp_id)))
    WHERE
        (roster.season_year = '2017-18')
    ORDER BY roster.team_name , hockey_person.age DESC;

/*the actual query*/
SELECT ordta1.*
FROM
```

```
    nhl.ordta ordta1
        INNER JOIN
    (SELECT
        Team, MAX(Age) AS max_age
    FROM
        ordta
    GROUP BY TEAM) ordta2 ON ordta1.Team = ordta2.Team
        AND ordta1.Age = ordta2.max_age;
```

```
1  SELECT ordta1.*
2  FROM
3      nhl.ordta ordta1
4          INNER JOIN
5      (SELECT
6          Team, MAX(Age) AS max_age
7      FROM
8          ordta
9      GROUP BY TEAM) ordta2 ON ordta1.Team = ordta2.Team
10         AND ordta1.Age = ordta2.max_age;
```

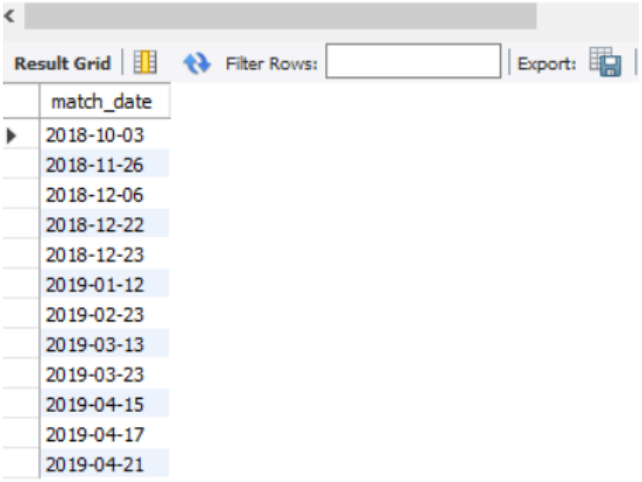
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Name	Team	Age
Shea Weber	Montreal Canadiens	34
Frederik Andersen	Toronto Maple Leafs	30
Corey Crawford	Chicago Blackhawks	35
Zdeno Chara	Boston Bruins	42
Henrik Lundqvist	New York Rangers	37
Trevor Daley	Detroit Red Wings	36

5. When were all the Maple Leafs home games during the 2018-2019 season?

```
SELECT match_date FROM nhl.match
WHERE season = '2018-19'
AND home_team = 'Toronto Maple Leafs';
```

```sql
SELECT match_date FROM nhl.match
where season = '2018-19'
and home_team = 'Toronto Maple Leafs';
```



Result Grid | Filter Rows: | Export:

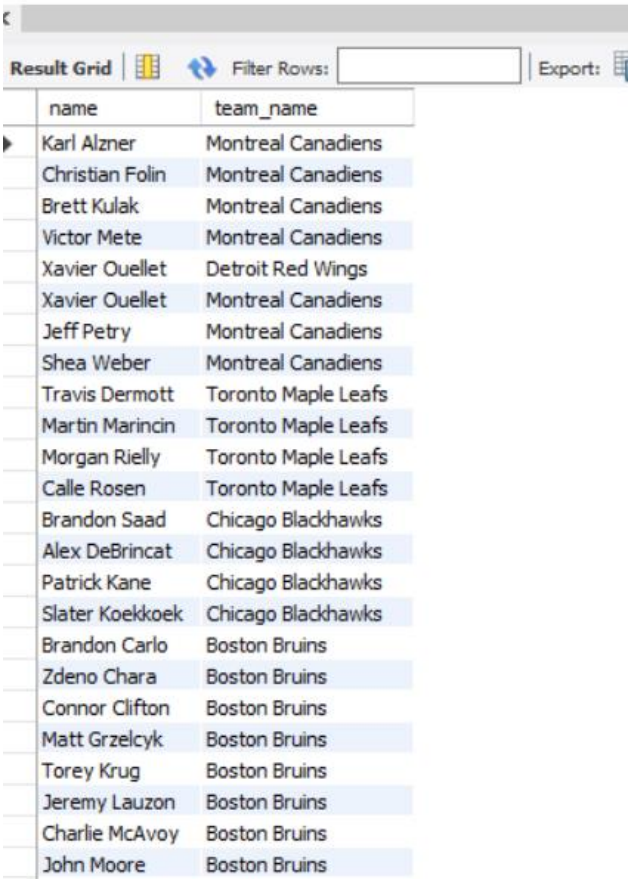
match_date
2018-10-03
2018-11-26
2018-12-06
2018-12-22
2018-12-23
2019-01-12
2019-02-23
2019-03-13
2019-03-23
2019-04-15
2019-04-17
2019-04-21

6. What are the names and teams of all defensemen?

```sql
SELECT DISTINCT p.name, r.team_name
FROM nhl.player p
INNER JOIN nhl.roster r
ON p.hp_id = r.hp_id
WHERE p.player_position = 'Defence';
```

Full results do not fit on one screen -- some records not shown.

```sql
SELECT DISTINCT p.name, r.team_name
FROM nhl.player p
INNER JOIN nhl.roster r
ON p.hp_id = r.hp_id
WHERE p.player_position = 'Defence';
```



Result Grid | Filter Rows: | Export:

name	team_name
Karl Alzner	Montreal Canadiens
Christian Folin	Montreal Canadiens
Brett Kulak	Montreal Canadiens
Victor Mete	Montreal Canadiens
Xavier Ouellet	Detroit Red Wings
Xavier Ouellet	Montreal Canadiens
Jeff Petry	Montreal Canadiens
Shea Weber	Montreal Canadiens
Travis Dermott	Toronto Maple Leafs
Martin Marincin	Toronto Maple Leafs
Morgan Rielly	Toronto Maple Leafs
Calle Rosen	Toronto Maple Leafs
Brandon Saad	Chicago Blackhawks
Alex DeBrincat	Chicago Blackhawks
Patrick Kane	Chicago Blackhawks
Slater Koekkoek	Chicago Blackhawks
Brandon Carlo	Boston Bruins
Zdeno Chara	Boston Bruins
Connor Clifton	Boston Bruins
Matt Grzelcyk	Boston Bruins
Torey Krug	Boston Bruins
Jeremy Lauzon	Boston Bruins
Charlie McAvoy	Boston Bruins
John Moore	Boston Bruins

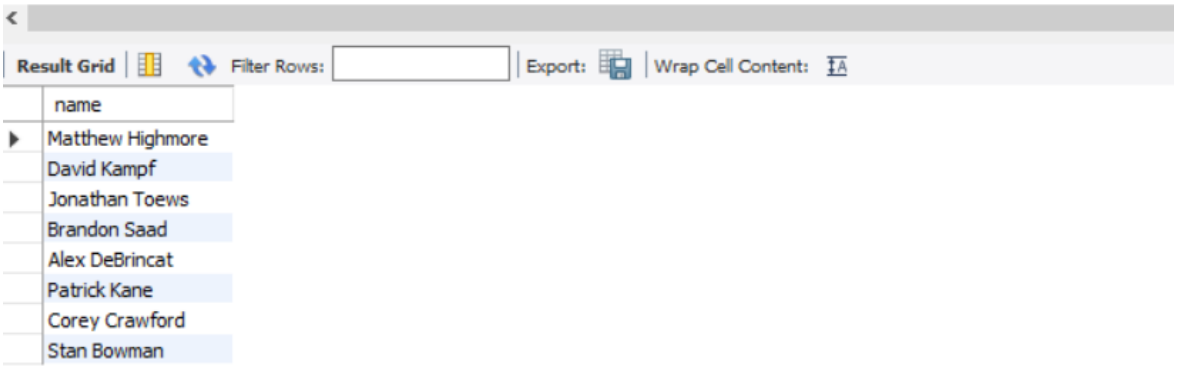
7. What are the names of everyone affiliated with the Chicago Blackhawks during the 2017-2018 season?

Since head coaches and general managers can be hired and fired at any point in the year, this SQL query filters for staff who started with the Blackhawks before the 2017-18 season ended.

```sql
SELECT player_name name
FROM nhl.roster
WHERE team_name = 'Chicago Blackhawks'
AND season_year = '2017-18'
UNION
SELECT staff_name name
FROM nhl.works_for
WHERE team_name = 'Chicago Blackhawks'
-- make sure they worked for the blackhawks during the 2017-18 season
```

```
AND start_date <= (SELECT end_date from nhl.season WHERE season_year = '2017-
18');
```

```
SELECT player_name name
FROM nhl.roster
WHERE team_name = 'Chicago Blackhawks'
AND season_year = '2017-18'
UNION
SELECT staff_name name
from nhl.works_for
WHERE team_name = 'Chicago Blackhawks'
AND start_date <= (SELECT end_date from nhl.season WHERE season_year = '2017-18');
```



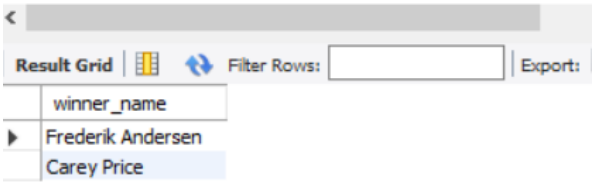
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

name
Matthew Highmore
David Kampf
Jonathan Toews
Brandon Saad
Alex DeBrincat
Patrick Kane
Corey Crawford
Stan Bowman

8. Who has won the Vezina Trophy the last 2 years?

```
SELECT winner_name
FROM nhl.award
WHERE award_name = 'Vezina Trophy'
ORDER BY season_year DESC LIMIT 2;
```

```
SELECT winner_name
FROM award
WHERE award_name = 'Vezina Trophy'
ORDER BY season_year DESC LIMIT 2;
```



Result Grid | Filter Rows: | Export:

winner_name
Frederik Andersen
Carey Price

9. Who are the head coaches for all the Eastern Conference teams?

The SQL query below assumes the English-language query is really asking for current Eastern Conference head coaches. Removing the 'AND end_date IS NULL' condition would return records for past as well as present head coaches. In that case, it would be more appropriate to SELECT DISTINCT.

```
SELECT staff_name
FROM nhl.works_for w
INNER JOIN team t
ON w.team_name = t.team_name
WHERE title = 'Head Coach'
AND conference='Eastern'
AND end_date IS NULL; -- null end date means they're a current coach
```

```
1   /*This query gets only current coaches */
2 • SELECT staff_name
3   FROM nhl.works_for w
4   INNER JOIN team t
5   ON w.team_name = t.team_name
6   WHERE title = 'Head Coach'
7   AND conference='Eastern'
8   AND end_date is NULL; -- null end date means they're a current coach
9
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

staff_name
Sheldon Keefe
Claude Julien
Bruce Cassidy
David Quinn
Jeff Blashill

10. What teams has David Kampf been associated with?

```
SELECT DISTINCT team_name
FROM nhl.roster
WHERE player_name = 'David Kampf';
```

```
1 •  SELECT DISTINCT team_name
2    FROM nhl.roster
3    WHERE player_name = 'David Kampf';
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

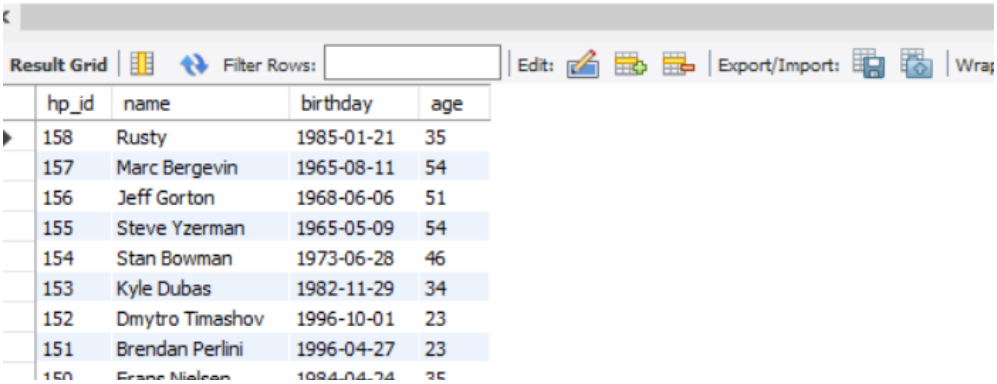
team_name
Chicago Blackhawks

Additional Queries (Insertions, Deletions, Updates)

Insertions

```
INSERT INTO `hockey_person` VALUES (DEFAULT, 'Rusty','1985-01-21',35);
```

```
1    INSERT INTO `hockey_person` VALUES (DEFAULT, 'Rusty','1985-01-21',35);
2
3    /* confirm the record was inserted */
4 •  SELECT * FROM nhl.hockey_person ORDER BY hp_id desc;
```

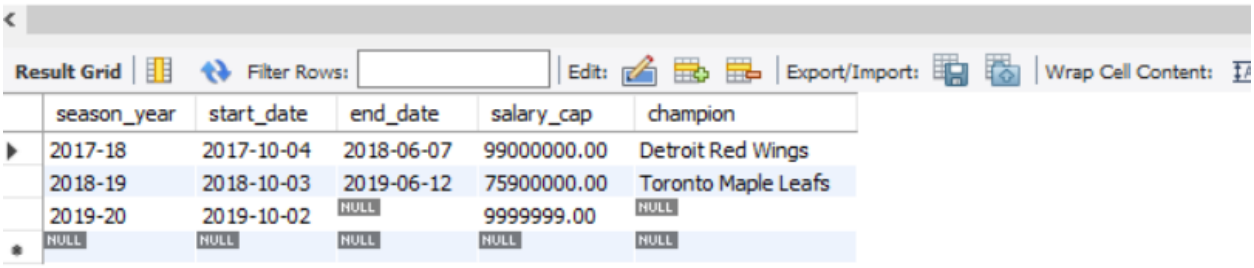


Result Grid | Filter Rows: | Edit: | Export/Import:

hp_id	name	birthday	age
158	Rusty	1985-01-21	35
157	Marc Bergevin	1965-08-11	54
156	Jeff Gorton	1968-06-06	51
155	Steve Yzerman	1965-05-09	54
154	Stan Bowman	1973-06-28	46
153	Kyle Dubas	1982-11-29	34
152	Dmytro Timashov	1996-10-01	23
151	Brendan Perlini	1996-04-27	23
150	Frans Nielsen	1984-04-24	35

```
INSERT INTO `season` VALUES ('2019-20', '2019-10-02', NULL, 9999999.00, NULL);
```

```
1 •  INSERT INTO `season` VALUES ('2019-20', '2019-10-02', NULL, 9999999.00, NULL);
2
3 •  SELECT * FROM nhl.season;
```



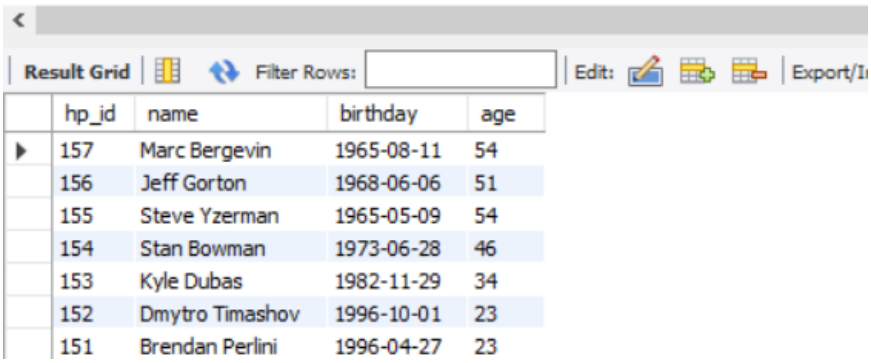
Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

season_year	start_date	end_date	salary_cap	champion
2017-18	2017-10-04	2018-06-07	99000000.00	Detroit Red Wings
2018-19	2018-10-03	2019-06-12	75900000.00	Toronto Maple Leafs
2019-20	2019-10-02	NULL	9999999.00	NULL
NULL	NULL	NULL	NULL	NULL

Deletions

```
/* delete a specific record */
DELETE FROM hockey_person WHERE name = 'Rusty';
```

```
1 •  DELETE FROM hockey_person WHERE name = 'Rusty';
2
3 •  SELECT * FROM nhl.hockey_person ORDER BY hp_id desc;
```



Result Grid | Filter Rows: | Edit: | Export/I

hp_id	name	birthday	age
157	Marc Bergevin	1965-08-11	54
156	Jeff Gorton	1968-06-06	51
155	Steve Yzerman	1965-05-09	54
154	Stan Bowman	1973-06-28	46
153	Kyle Dubas	1982-11-29	34
152	Dmytro Timashov	1996-10-01	23
151	Brendan Perlini	1996-04-27	23

```
/* delete all rows in a table */
DELETE FROM award;
```

```
1     DELETE FROM award;
2 •   SELECT * FROM award;
```

Result Grid | Filter Rows: | Edit:

season_year	award_name	winner_id	winner_name
NULL	NULL	NULL	NULL

Updates

```
/* builds off of the INSERT query above */
UPDATE season
SET end_date = '2020-03-11'
WHERE season_year = '2019-20';
```

```
1     UPDATE season
2     SET end_date = '2020-03-11'
3     WHERE season_year = '2019-20';
4
5 •   SELECT * FROM season;
```

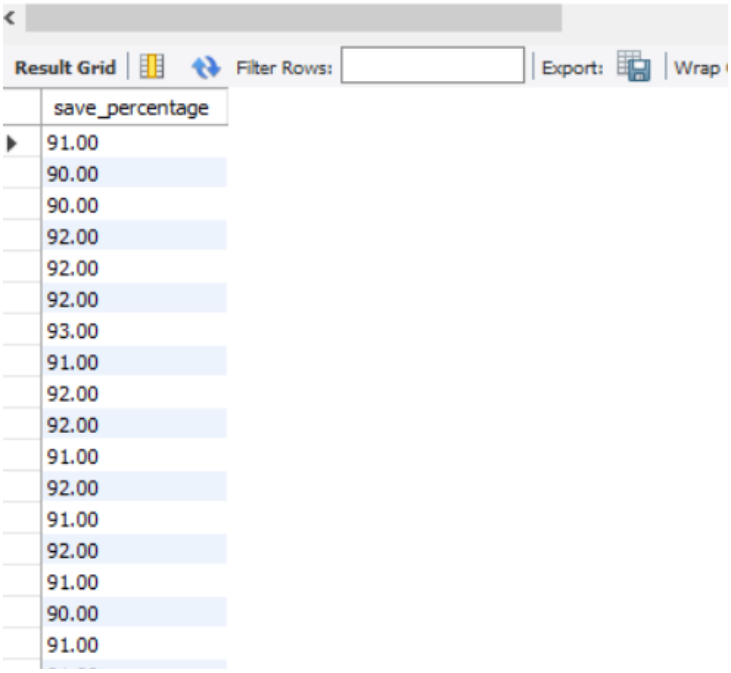
Result Grid | Filter Rows: | Edit: | Export/Imp

season_year	start_date	end_date	salary_cap	champion
2017-18	2017-10-04	2018-06-07	99000000.00	Detroit Red Wings
2018-19	2018-10-03	2019-06-12	75900000.00	Toronto Maple Leafs
2019-20	2019-10-02	2020-03-11	9999999.00	NULL
NULL	NULL	NULL	NULL	NULL

```
/* Convert save_percentage from [0,1] to [0,100] range */
UPDATE goalie_stats
SET save_percentage = save_percentage * 100;
```

```sql
UPDATE goalie_stats
SET save_percentage = save_percentage * 100;

SELECT save_percentage FROM goalie_stats;
```


Result Grid | Filter Rows: | Export: | Wrap

save_percentage
91.00
90.00
90.00
92.00
92.00
92.00
93.00
91.00
92.00
92.00
91.00
92.00
91.00
92.00
91.00
90.00
91.00