

## **Class 7. SQL 심화**

# 조인(JOIN)

지금까지 어떤 선수의 playerId 확인은 people 테이블에서 해야 했고,  
그 playerId를 기반으로 batting 테이블이나 pitching 테이블에서 그 선수의 데이터를 조회했음.

꽤 귀찮고 번거로움.

한 번에 해결할 수 없을까?

JOIN을 활용하면 가능.

JOIN은 두 개 이상의 테이블을 조합할 때 사용되는 문법

SQLite3에는 세 가지 유형의 JOIN을 지원

유형	설명
INNER JOIN	조인 중 가장 많이 사용됨 간단히 JOIN이라고 부르기도 함
LEFT OUTER JOIN	간단히 LEFT JOIN이라고 부르기도 함
CROSS JOIN	

# INNER JOIN

```
sqlite> SELECT * FROM team;
```

team_id	team_name
1	SSG
2	LG
3	키움
4	KIA
5	삼성
6	롯데
7	두산
8	KT
9	NC
10	한화

```
sqlite> SELECT * FROM player;
```

name	team_id
김광현	1
반즈	6
소형준	8
안우진	3
심교훈	

```
SELECT * FROM player INNER JOIN team ON player.team_id = team.team_id;
```

name	team_id	team_id	team_name
김광현	1	1	SSG
반즈	6	6	롯데
소형준	8	8	KT
안우진	3	3	키움

# LEFT OUTER JOIN

```
sqlite> SELECT * FROM team;
team_id  team_name
-----
1        SSG
2        LG
3        키움
4        KIA
5        삼성
6        롯데
7        두산
8        KT
9        NC
10       한화
```

```
sqlite> SELECT * FROM player;
name      team_id
-----
김광현    1
반즈      6
소형준    8
안우진    3
심교훈
```

```
SELECT * FROM player LEFT OUTER JOIN team ON player.team_id = team.team_id;
```

name	team_id	team_id	team_name
김광현	1	1	SSG
반즈	6	6	롯데
소형준	8	8	KT
안우진	3	3	키움
심교훈			

team\_id가 없었던 행도 보여줌

# CROSS JOIN

```
sqlite> SELECT * FROM team;
```

team_id	team_name
1	SSG
2	LG
3	키움
4	KIA
5	삼성
6	롯데
7	두산
8	KT
9	NC
10	한화

```
sqlite> SELECT * FROM player;
```

name	team_id
김광현	1
반즈	6
소형준	8
안우진	3
심교훈	

```
SELECT * FROM player CROSS JOIN team;
```

name	team_id	team_id	team_name
김광현	1	1	SSG
김광현	1	2	LG
김광현	1	3	키움
김광현	1	4	KIA
김광현	1	5	삼성
김광현	1	6	롯데
김광현	1	7	두산
김광현	1	8	KT
김광현	1	9	NC
김광현	1	10	한화
반즈	6	1	SSG
반즈	6	2	LG
반즈	6	3	키움
반즈	6	4	KIA
반즈	6	5	삼성
반즈	6	6	롯데
반즈	6	7	두산
반즈	6	8	KT
반즈	6	9	NC
반즈	6	10	한화
소형준	8	1	SSG
소형준	8	2	LG
소형준	8	3	키움
소형준	8	4	KIA
소형준	8	5	삼성
소형준	8	6	롯데
소형준	8	7	두산
소형준	8	8	KT
소형준	8	9	NC
소형준	8	10	한화
안우진	3	1	SSG
안우진	3	2	LG
안우진	3	3	키움
안우진	3	4	KIA
안우진	3	5	삼성
안우진	3	6	롯데
안우진	3	7	두산
안우진	3	8	KT
안우진	3	9	NC
안우진	3	10	한화
심교훈		1	SSG
심교훈		2	LG
심교훈		3	키움
심교훈		4	KIA
심교훈		5	삼성
심교훈		6	롯데
심교훈		7	두산
심교훈		8	KT
심교훈		9	NC
심교훈		10	한화

## 내부 조인(INNER JOIN)

```
SELECT <컬럼 목록>
FROM <첫번째 테이블명>
      INNER JOIN <두번째 테이블명>
      ON <조인될 조건>
[WHERE 검색 조건]
```

**batting** 테이블

playerID	yearID	H	...	HR
<b>choosh01</b>	2019	149		24
cruzne02	2019	141		41
...				
alonspe01	2020	155		53
yelicch01	2020	161		44

```
SELECT <컬럼 목록>
FROM batting
      INNER JOIN people
      ON batting.playerID = people.playerID
[WHERE 검색 조건]
```

**people** 테이블

playerID	...	nameFirst	nameLast
aardsda01		David	Aardsma
abadijo01		John	Abadie
...			
<b>choosh01</b>		Shin-soo	Choo
parkch01		Chan-ho	Park

두 행  
결합



## 내부 조인(INNER JOIN)

```
SELECT <컬럼 목록>  
FROM <첫번째 테이블명>  
      INNER JOIN <두번째 테이블명>  
      ON <조인될 조건>  
[WHERE 검색 조건]
```

```
SELECT <컬럼 목록>  
FROM batting  
      INNER JOIN people  
      ON batting.playerID = people.playerID  
[WHERE 검색 조건]
```

playerID	yearID	H	...	HR	playerID	...	nameFirst	nameLast
<b>choosh01</b>	2019	149		24	<b>choosh01</b>		Shin-soo	Choo
<b>cruzne02</b>	2019	141		41	<b>cruzne02</b>		Nelson	Cruz
...								
<b>alonspe01</b>	2020	155		53	<b>alonspe01</b>		Pete	Alonso
<b>yelicch01</b>	2020	161		44	<b>yelicch01</b>		Christian	Yelich

결합된 결과

# 내부 조인(INNER JOIN)

1) 2019년 MLB 한국 선수 홈런 개수를 알아보자(playerID 대신에 선수 이름이 보이도록)

```
SELECT batting.*, people.* FROM batting INNER JOIN people ON batting.playerID = people.playerID WHERE batting.yearID = 2019 and people.birthCountry = 'South Korea';
```

sqlite> SELECT batting.*, people.* FROM batting INNER JOIN people ON batting.playerID = people.playerID WHERE batting.yearID = 2019 and people.birthCountry = 'South Korea';																											
ID	playerID	yearID	stint	teamID	team_ID	lgID	G	G_batting	AB	R	H	2B	3B	HR	RBI	SB	CS	BB	SO	IBB	HBP	SH	SF	GIDP	play		
erID	birthYear	birthMonth	birthDay	birthCountry	birthState	birthCity	deathYear	deathMonth	deathDay	deathCountry	deathState	deathCity	nameFirst	nameLast	nameGiven	weight	height	bats	throws	debut	finalGame	retroID	bbrefID	birth_date	debu		
t_date	finalgame_date	death_date																									
-----																											
106135	choijj01	2019	1	TBA	2922	AL	127		410	54	107	20	2	19	63	2	3	64	108	2	6	0	7	7	choi		
j101	1991	5	19	South Korea	Incheon	Incheon							Ji-Man	Choi	Ji-Man	250	73	L	R	2016-04-05	2019-09-29	choijj001	choijj01	1991-05-19	2016		
-04-05	2019-09-29																										
106136	choosh01	2019	1	TEX	2923	AL	151		563	93	149	31	2	24	61	15	1	78	165	3	18	0	1	6	choo		
sh01	1982	7	13	South Korea	Busan	Busan							Shin-Soo	Choo	Shin-Soo	210	71	L	L	2005-04-21	2019-09-29	choos001	choosh01	1982-07-13	2005		
-04-21	2019-09-29																										
106506	kangju01	2019	1	PIT	2917	NL	65		172	15	29	7	1	10	24	0	0	11	60	0	1	0	1	4	kang		
ju01	1987	4	5	South Korea	Gwangju	Gwangju							Jung Ho	Kang	Jung Ho	210	72	R	R	2015-04-08	2019-07-29	kangj001	kangju01	1987-04-05	2015		
-04-08	2019-07-29																										
106076	ohse01	2019	1	COL	2904	NL	21		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ohse		
01	1982	7	15	South Korea	North Jeol	Jeongeup							Seunghwan	Oh	Seunghwan	205	70	R	R	2016-04-03	2019-05-30	oh--s001	ohse01	1982-07-15	2016		
-04-03	2019-05-30																										
107087	ryuhy01	2019	1	LAN	2909	NL	30		51	3	8	1	0	1	3	0	0	4	23	0	0	12	0	0	ryuh		
y01	1987	3	25	South Korea	Incheon	Incheon							Hyun-Jin	Ryu	Hyun-Jin	255	75	R	L	2013-04-02	2019-09-28	ryu-h001	ryuhy01	1987-03-25	2013		
-04-02	2019-09-28																										

```
SELECT batting.yearID, people.nameLast, people.nameFirst, batting.HR FROM batting INNER JOIN people ON batting.playerID = people.playerID WHERE batting.yearID = 2019 and people.birthCountry = 'South Korea';
```

yearID	nameLast	nameFirst	HR
2019	Choi	Ji-Man	19
2019	Choo	Shin-Soo	24
2019	Kang	Jung Ho	10
2019	Oh	Seunghwan	0
2019	Ryu	Hyun-Jin	1



## 내부 조인(INNER JOIN)

2) 2015년 “오른손” 타자 중에 안타를 가장 많이 친 선수 5명은 누구일까?

```
SELECT batting.yearID, people.nameFirst, people.nameLast, people.bats, batting.H FROM batting INNER JOIN people ON batting.playerID = people.playerID WHERE batting.yearID = 2015 and people.bats = 'R' ORDER BY batting.H DESC LIMIT 5;
```

yearID	nameFirst	nameLast	bats	H
2015	Jose	Altuve	R	200
2015	Xander	Bogaerts	R	196
2015	A. J.	Pollock	R	192
2015	Ian	Kinsler	R	185
2015	Josh	Donaldson	R	184

3) 2015년 “왼손” 투수 중에 탈삼진을 가장 많이 잡은 선수 5명은 누구일까?

```
SELECT pitching.yearID, people.nameFirst, people.nameLast, peoplethrows, pitching.SO FROM pitching INNER JOIN people ON pitching.playerID = people.playerID WHERE pitching.yearID = 2015 and peoplethrows = 'L' ORDER BY pitching.SO DESC LIMIT 5;
```

yearID	nameFirst	nameLast	throws	SO
2015	Clayton	Kershaw	L	301
2015	Chris	Sale	L	274
2015	Madison	Bumgarner	L	234
2015	Dallas	Keuchel	L	216
2015	Jon	Lester	L	207

## 내부 조인(INNER JOIN)

4) 2019년 월드시리즈에서 가장 많은 탈삼진을 잡은 선수 10명의 기록은?

```
SELECT pitchingpost.yearID, pitchingpost.round, pitchingpost.teamID, people.nameFirst, people.nameLast, pitchingpost.SO FROM pitchingpost JOIN people ON pitchingpost.playerID = people.playerID WHERE pitchingpost.yearID = 2019 AND pitchingpost.round = 'WS' ORDER BY pitchingpost.SO DESC LIMIT 10;
```

yearID	round	teamID	nameFirst	nameLast	SO
2019	WS	HOU	Gerrit	Cole	15
2019	WS	WAS	Stephen	Strasburg	14
2019	WS	WAS	Patrick	Corbin	10
2019	WS	WAS	Max	Scherzer	10
2019	WS	HOU	Zack	Greinke	9
2019	WS	HOU	Justin	Verlander	9
2019	WS	WAS	Daniel	Hudson	5
2019	WS	HOU	Josh	James	5
2019	WS	HOU	Will	Harris	4
2019	WS	HOU	Brad	Peacock	4

Sports Reference | Baseball | Football (college) | Basketball (college) | Hockey | Football | Blog | Stathead | Widgets | Create Account | Login | Questions or Comments?

**BASEBALL REFERENCE**

2019 world series

Search

Players | Teams | Seasons | Leaders | Scores <sup>12</sup> | Playoffs | Stathead | Newsletter | Full Site Menu Below ▾

Baseball Stats and History The complete source for current and historical baseball players, teams, scores and leaders.

**22,671 Major League Players**

View any Active Player:

Choose a Team ▾

Then a player ▾

Go!

Select a Hall of Famer:

**Every Major League Team**

**2022 MLB Standings**

[MLB Summary](#) · [Scores](#) · [Schedule](#) · [Leaders](#) · [Standings](#) · [Transactions](#)  
[AL Summary](#) · Leaders: [Batting](#) · [Pitching](#) · [Standings](#) · [Attendance](#)  
[NL Summary](#) · Leaders: [Batting](#) · [Pitching](#) · [Standings](#) · [Attendance](#)

AL	W	L	GB	SRS
<b>East</b>				
<a href="#">NYY</a>	29	13	--	1.1
<a href="#">TBR</a>	24	17	4.5	0.0
<a href="#">TOR</a>	22	20	7.0	-0.1
<a href="#">BOS</a>	19	22	9.5	0.0
<a href="#">BAL</a>	18	25	11.5	-0.6
<b>Central</b>				
<a href="#">MIN</a>	26	16	--	0.4
<a href="#">CHW</a>	21	20	4.5	-0.7
<a href="#">CLE</a>	18	20	6.0	0.0
<a href="#">DET</a>	14	27	11.5	-1.3
<a href="#">KCR</a>	14	27	11.5	-1.6

NL	W	L	GB	SRS
<b>East</b>				
<a href="#">NYM</a>	29	15	--	1.4
<a href="#">PHI</a>	20	22	8.0	0.9
<a href="#">ATL</a>	19	23	9.0	-0.1
<a href="#">MIA</a>	18	22	9.0	0.6
<a href="#">WSN</a>	14	29	14.5	-1.1
<b>Central</b>				
<a href="#">MIL</a>	26	16	--	0.2
<a href="#">STL</a>	24	18	2.0	0.9
<a href="#">CHC</a>	17	24	8.5	-0.4
<a href="#">PIT</a>	17	24	8.5	-1.3
<a href="#">CIN</a>	12	29	13.5	-1.7

**Stathead**

**STATHEAD BASEBALL**

The Most Powerful Research Tools in Sports.  
Find any player, any team, any season, any game, any play.

Subscribe Now (First Month Free)

**Season and Career Finder**  
Find single-season or multi-year totals to create leaderboards by team, position, age, and more.

Ex: [Which pitching staff threw the most pitches in a season \(since 1988\)?](#)

[Player Batting](#) · [Player Pitching](#) · [Team Batting](#) · [Team Pitching](#)

**Game Finder**  
Find individual games matching a variety of criteria. Includes options for postseason games and All-Star Games.

베이스볼레퍼런스에서는 검색창에 2019 world series 라고 검색하면,  
2019년 월드시리즈 관련 기록 페이지로 바로 이동!

## 내부 조인(INNER JOIN)

5) 2015년 홈런 TOP 10의 이름과 팀 이름은? (3개 테이블 조인)

```
SELECT batting.yearID, teams.teamID, teams.name, people.playerID, people.nameFirst, people.nameLast,  
batting.HR FROM batting JOIN people ON batting.playerID = people.playerID  
JOIN teams ON batting.teamID = teams.teamID  
WHERE batting.yearID = 2015 AND teams.yearID = 2015 ORDER BY batting.HR DESC LIMIT 10;
```

yearID	teamID	name	playerID	nameFirst	nameLast	HR
2015	BAL	Baltimore Orioles	davisch02	Chris	Davis	47
2015	SEA	Seattle Mariners	cruzne02	Nelson	Cruz	44
2015	COL	Colorado Rockies	arenano01	Nolan	Arenado	42
2015	WAS	Washington Nation	harpebr03	Bryce	Harper	42
2015	TOR	Toronto Blue Jays	donaljo02	Josh	Donaldson	41
2015	LAA	Los Angeles Angel	troutmi01	Mike	Trout	41
2015	TOR	Toronto Blue Jays	bautijo02	Jose	Bautista	40
2015	COL	Colorado Rockies	gonzaca01	Carlos	Gonzalez	40
2015	LAA	Los Angeles Angel	pujolal01	Albert	Pujols	40
2015	TOR	Toronto Blue Jays	encared01	Edwin	Encarnacio	39

yearID	teamID	name	playerID	nameFirst	nameLast	HR
2015	BAL	Baltimore Orioles	davisch02	Chris	Davis	47
2015	SEA	Seattle Mariners	cruzne02	Nelson	Cruz	44
2015	COL	Colorado Rockies	arenano01	Nolan	Arenado	42
2015	WAS	Washington Nation	harpebr03	Bryce	Harper	42
2015	TOR	Toronto Blue Jays	donaljo02	Josh	Donaldson	41
2015	LAA	Los Angeles Angel	troutmi01	Mike	Trout	41
2015	TOR	Toronto Blue Jays	bautijo02	Jose	Bautista	40
2015	COL	Colorado Rockies	gonzaca01	Carlos	Gonzalez	40
2015	LAA	Los Angeles Angel	pujolal01	Albert	Pujols	40
2015	TOR	Toronto Blue Jays	encared01	Edwin	Encarnacio	39

## Player Standard Batting

Share & Export ▼

☒ When table is sorted by rate stats, hide non-qualifiers (min. 3.1 PA/G(IgAvg))

[Glossary](#)

[Show Partial Rows](#)

Rk	Name	Age	Tm	Lg	G	PA	AB	R	H	2B	3B	HR	RBI	SB	CS	BB	SO	BA	OBP	SLG	OPS	OPS+	TB	GDP	HBP	SH	SF	IBB	Pos Summary
1	<a href="#">Chris Davis*</a>	29	<a href="#">BAL</a>	AL	160	670	573	100	150	31	0	47	117	2	3	84	208	.262	.361	.562	.923	147	322	6	8	0	5	6	*39D
2	<a href="#">Nelson Cruz</a>	34	<a href="#">SEA</a>	AL	152	655	590	90	178	22	1	44	93	3	2	59	164	.302	.369	.566	.936	159	334	6	5	0	1	9	9D
3	<a href="#">Nolan Arenado</a>	24	<a href="#">COL</a>	NL	157	665	616	97	177	43	4	42	130	2	5	34	110	.287	.323	.575	.898	124	354	17	4	0	11	13	*5/H
4	<a href="#">Bryce Harper*</a>	22	<a href="#">WSN</a>	NL	153	654	521	118	172	38	1	42	99	6	4	124	131	.330	.460	.649	1.109	198	338	15	5	0	4	15	*98/D
5	<a href="#">Josh Donaldson</a>	29	<a href="#">TOR</a>	AL	158	711	620	122	184	41	2	41	123	6	0	73	133	.297	.371	.568	.939	151	352	16	6	2	10	0	*5/DH
6	<a href="#">Mike Trout</a>	23	<a href="#">LAA</a>	AL	159	682	575	104	172	32	6	41	90	11	7	92	158	.299	.402	.590	.991	176	339	11	10	0	5	14	*8/D
7	<a href="#">Jose Bautista</a>	34	<a href="#">TOR</a>	AL	153	666	543	108	136	29	3	40	114	8	2	110	106	.250	.377	.536	.913	145	291	19	5	0	8	2	*9D/H
8	<a href="#">Carlos Gonzalez*</a>	29	<a href="#">COL</a>	NL	153	608	554	87	150	25	2	40	97	2	0	46	133	.271	.325	.540	.864	116	299	11	1	1	6	6	*9/H
9	<a href="#">Albert Pujols</a>	35	<a href="#">LAA</a>	AL	157	661	602	85	147	22	0	40	95	5	3	50	72	.244	.307	.480	.787	118	289	15	6	0	3	10	3D/5
10	<a href="#">Edwin Encarnacion</a>	32	<a href="#">TOR</a>	AL	146	624	528	94	146	31	0	39	111	3	2	77	98	.277	.372	.557	.929	148	294	14	9	0	10	5	D3/H

# 서브쿼리(subquery)

서브쿼리(subquery): 쿼리문 안에 포함되어 있는 또 다른 쿼리문

## 서브쿼리 사용시 주의사항

- 1. 서브쿼리는 괄호로 감싸줘야 함
- 2. 서브쿼리에서는 ORDER BY 사용 불가

서브쿼리 사용 가능 위치
SELECT 절
FROM 절
WHERE 절
HAVING 절
ORDER BY 절
INSERT 문의 VALUES 절
UPDATE 문의 SET 절

데이터 추가시 사용

데이터 수정시 사용

## 1. FROM 절에 서브쿼리가 사용된 경우(추신수 2019 OPS)

```
SELECT playerID, (SLG + OBP) AS OPS FROM (SELECT playerID, CAST((((H - "2B" - "3B" - HR) + 2*"2B" + 3*"3B" + 4*HR) AS REAL)/AB AS SLG, CAST((H + BB + HBP) AS REAL)/(AB + BB + HBP + SF) AS OBP FROM batting WHERE yearID = 2019 and playerID = 'choosh01');
```

playerID	OPS
choosh01	0.825919048387965

# 서브쿼리(subquery)

## 2. SELECT 절에 서브쿼리가 사용된 경우

```
SELECT COUNT(*), (SELECT AVG(salary) FROM salaries WHERE playerID = 'choosh01') FROM batting WHERE playerID = 'choosh01';
```

COUNT(*)	(SELECT AVG(salary) FROM salaries WHERE playerID = 'choosh01')
16	7280200.0

## 3. WHERE 절에 서브쿼리가 사용된 경우

1) 2019년에 커쇼가 기록한 탈삼진보다 더 많은 탈삼진을 기록한 2019년 투수 기록은?

```
SELECT playerID, SO FROM pitching  
WHERE  
SO > (SELECT SO FROM pitching WHERE playerID = 'kershcl01' and yearID = 2019)  
and yearID = 2019;
```

189

playerID	SO
berrijo01	195
biebesh01	259
boydma01	238
buehlwa01	215
bungama01	203
castilu02	226
college01	326
corbipa01	238
darviyu01	229
degroja01	255
flaheja01	231
giolilu01	228
grayso01	205
lynnla01	246
minormi01	200
mortoch02	240
nolaaa01	229
rayro02	235
rodried05	213
salech01	218
scherma01	243
strasst01	251
syndeno01	202
verlaju01	300
wheelza01	195

# 서브쿼리(subquery)

## 2) 일본 출생 선수들의 타자 기록은?

```
SELECT * FROM batting WHERE playerID IN (SELECT playerID FROM people WHERE birthCountry = 'Japan');
```

ID	playerID	yearID	stint	teamID	team_ID	lgID	G	G_batting	AB	R	H	2B	3B	HR	RBI	SB	CS	BB	SO	IBB	HBP	SH	SF	GIDP
95646	aokino01	2012	1	MIL	2701	NL	151		520	81	150	37	4	10	50	30	8	43	55	1	13	7	5	6
97051	aokino01	2013	1	MIL	2731	NL	155		597	80	171	20	3	8	37	20	12	55	40	1	11	8	3	9
98469	aokino01	2014	1	KCA	2757	AL	132		491	63	140	22	6	1	43	17	8	43	49	0	6	8	1	5
99905	aokino01	2015	1	SFN	2800	NL	93		355	42	102	12	3	5	26	14	5	30	25	0	6	1	0	8
101392	aokino01	2016	1	SEA	2829	AL	118		417	63	118	24	4	4	28	7	9	34	45	0	9	5	1	9
102883	aokino01	2017	1	HOU	2846	AL	71		202	28	55	12	1	2	19	5	2	15	29	1	2	1	4	11
102884	aokino01	2017	2	TOR	2864	AL	12		32	4	9	1	0	3	8	0	0	1	5	0	0	0	1	0
102885	aokino01	2017	3	NYN	2854	NL	27		102	16	29	7	1	0	8	5	0	13	10	0	1	0	0	1
71972	bowiej01	1994	1	OAK	2173	AL	6		14	0	3	0	0	0	0	0	0	0	2	0	0	1	0	1
67607	chitrst01	1990	1	OAK	2065	AL	8		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68727	chitrst01	1991	1	OAK	2091	AL	56		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95910	darviyu01	2012	1	TEX	2713	AL	29		3	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
97327	darviyu01	2013	1	TEX	2743	AL	32		3	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
98729	darviyu01	2014	1	TEX	2773	AL	22		5	0	1	1	0	0	0	0	0	0	2	0	0	0	0	0
101651	darviyu01	2016	1	TEX	2833	AL	17		3	1	1	0	0	1	1	0	0	0	1	0	0	0	0	1
103135	darviyu01	2017	1	TEX	2863	AL	22		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103136	darviyu01	2017	2	LAN	2849	AL	9		17	0	1	0	0	0	0	0	0	1	14	0	0	2	0	0
104639	darviyu01	2018	1	CHN	2871	NL	8		12	0	1	1	0	0	0	0	0	0	7	0	0	2	0	0
106188	darviyu01	2019	1	CHN	2901	NL	31		56	1	5	0	0	0	3	0	0	2	31	0	0	3	1	1
50224	fenwibo01	1972	1	HOU	1599	NL	36		50	7	9	3	0	0	4	0	1	3	13	1	0	0	0	1
51123	fenwibo01	1973	1	SLN	1636	AL	5		6	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0
97462	fujikky01	2013	1	CHN	2721	NL	12		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98874	fujikky01	2014	1	CHN	2751	NL	15		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100320	fujikky01	2015	1	TEX	2803	AL	2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90514	fukudko01	2008	1	CHN	2571	NL	150		501	79	129	25	3	10	58	12	4	81	104	9	1	2	5	7
91898	fukudko01	2009	1	CHN	2601	NL	146		499	79	129	38	5	11	54	6	10	93	112	3	3	3	5	15
93279	fukudko01	2010	1	CHN	2631	NL	130		358	45	94	20	2	13	44	7	8	64	67	1	0	3	4	5
94641	fukudko01	2011	1	CHN	2661	NL	87		293	33	80	15	2	3	13	2	2	46	57	1	1	5	0	2
94642	fukudko01	2011	2	CLE	2663	AL	59		237	26	59	12	1	5	22	2	4	15	53	3	3	1	2	6
90047	fukudko01	2012	1	CHA	2690	AL	24		41	2	7	1	0	0	4	0	1	8	9	0	0	0	2	0
90515	fukumka01	2008	1	TEX	2593	AL	4		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75877	hasegsh01	1997	1	ANA	2238	AL	50		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77127	hasegsh01	1998	1	ANA	2266	AL	61		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78400	hasegsh01	1999	1	ANA	2296	AL	64		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79767	hasegsh01	2000	1	ANA	2326	AL	66		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81146	hasegsh01	2001	1	ANA	2356	AL	46		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82476	hasegsh01	2002	1	SEA	2410	AL	53		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83008	hasegsh01	2003	1	SEA	2440	AL	63		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85213	hasegsh01	2004	1	SEA	2470	AL	68		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86533	hasegsh01	2005	1	SEA	2499	AL	46		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104975	hiranyo01	2018	1	ARI	2866	NL	75		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106531	hiranyo01	2019	1	ARI	2896	NL	62		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79819	housecr01	2000	1	COL	2335	NL	16		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93444	igarary01	2010	1	NYN	2644	NL	34		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94820	igarary01	2011	1	NYN	2674	NL	45		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96222	igarary01	2012	1	TOR	2714	AL	2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96223	igarary01	2012	2	NYA	2703	AL	2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89294	igawake01	2007	1	NYA	2553	AL	14		0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
90696	igawake01	2008	1	NYA	2583	AL	2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86592	iguchta01	2005	1	CHA	2480	AL	135		511	74	142	25	6	15	71	15	5	47	114	0	6	11	6	16
87921	iguchta01	2006	1	CHA	2510	AL	138		555	97	156	24	0	18	67	11	5	59	110	0	3	8	2	7
89295	iguchta01	2007	1	CHA	2540	AL	90		327	45	82	17	4	6	31	8	1	44	65	1	2	1	3	5
89296	iguchta01	2007	2	PHI	2556	NL	45		138	22	42	10	0	3	12	6	1	13	23	0	1	1	3	1
90697	iguchta01	2008	1	SDN	2588	NL	81		303	29	70	14	1	2	24	8	1	26	75	0	0	1	0	11



## 서브쿼리(subquery)

3) 2016년에 MLB 평균연봉 이상을 수령한 선수는 상위 몇 퍼센트?

```
SELECT (SELECT COUNT(*)+0.0 FROM salaries WHERE yearID = 2016 AND salary >= (SELECT AVG(salary) FROM salaries WHERE yearID = 2016))/(SELECT COUNT(*) FROM salaries WHERE yearID = 2016);
```

0.30715123094959

상위 30%

# IN의 활용

playerID가 parkch01 또는 ryuhy01 또는 kimby01 중에 하나인 선수의 ERA  
를 조회하라

```
SELECT playerID, yearID, ERA FROM pitching  
WHERE playerID IN ('parkch01', 'ryuhy01', 'kimby01');
```



```
SELECT playerID, yearID, ERA FROM pitching  
WHERE playerID = 'parkch01' OR playerID = 'ryuhy01' OR playerID = 'kimby01';
```

```
SELECT playerID, yearID, ERA FROM pitching  
WHERE playerID NOT IN ('parkch01', 'ryuhy01', 'kimby01');
```

위 playerID인 선수들의 데이터를 제외한 나머지 선수들의 데이터 조회하고 싶을 때

playerID	yearID	ERA
kimby01	1999	4.61
kimby01	2000	4.46
kimby01	2001	2.94
kimby01	2002	2.04
kimby01	2003	3.56
kimby01	2003	3.18
kimby01	2004	6.23
kimby01	2005	4.86
kimby01	2006	5.57
kimby01	2007	10.5
kimby01	2007	4.16
kimby01	2007	23.63
kimby01	2007	8.21
parkch01	1994	11.25
parkch01	1995	4.5
parkch01	1996	3.64
parkch01	1997	3.38
parkch01	1998	3.71
parkch01	1999	5.23
parkch01	2000	3.27
parkch01	2001	3.5
parkch01	2002	5.75
parkch01	2003	7.58
parkch01	2004	5.46
parkch01	2005	5.66
parkch01	2005	5.91
parkch01	2006	4.81
parkch01	2007	15.75
parkch01	2008	3.4
parkch01	2009	4.43
parkch01	2010	5.6
parkch01	2010	3.49
ryuhy01	2013	3.0
ryuhy01	2014	3.38
ryuhy01	2016	11.57
ryuhy01	2017	3.77
ryuhy01	2018	1.97
ryuhy01	2019	2.32

## BETWEEN ... AND ... 의 활용

2019년 세이브 개수가 20이상 30이하인 선수의 세이브 수를 조회하라

```
SELECT playerID, yearID, SV FROM pitching WHERE (SV BETWEEN 20 AND 30) AND yearID = 2019;
```

playerID	yearID	SV
colomal01	2019	30
diazed04	2019	26
doolise01	2019	29
gileske01	2019	23
greensh02	2019	22
hendrli01	2019	25
kenneia01	2019	30
martica04	2019	24
nerishe01	2019	28
paganem01	2019	20
riverfe01	2019	28
robleha01	2019	23
rogerta01	2019	30

# GROUP BY의 활용

GROUP BY는 그룹으로 묶어주는 역할을 함  
GROUP BY는 보통 SUM, COUNT 등의 집계함수와 함께 사용됨

batting 테이블을 활용하여 2019 시즌 각 팀의 총 안타 개수를 조회하라

```
SELECT playerID, teamID, H FROM batting WHERE yearID = 2019 ORDER BY teamID;
```

```
SELECT teamID, SUM(H) FROM batting WHERE yearID = 2019 GROUP BY teamID;
```

batting 테이블을 활용하여 2019 시즌 각 팀 총 안타 개수가 1500개 초과인 팀의 총 안타 개수를 조회하라

```
SELECT teamID, SUM(H) FROM batting WHERE yearID = 2019 GROUP BY teamID  
HAVING SUM(H) > 1500;
```

GROUP BY 절 내에서 집계 함수에 대해서 조건을 주고 싶을 때는 HAVING을 사용

teamID	SUM(H)
ARI	1419
ATL	1432
BAL	1379
BOS	1554
CHA	1443
CHN	1378
CIN	1328
CLE	1354
COL	1502
DET	1333
HOU	1538
KCA	1356
LAA	1368
LAN	1414
MIA	1326
MIL	1366
MIN	1547
NYA	1493
NYN	1445
OAK	1384
PHI	1369
PIT	1497
SDN	1281
SEA	1305
SFN	1332
SLN	1336
TBA	1427
TEX	1374
TOR	1299
WAS	1460

teamID	SUM(H)
BOS	1554
COL	1502
HOU	1538
MIN	1547

# GROUP BY의 활용

GROUP BY 한 것을 정렬해주려면?

teamID	SUM(H)
-----	-----
BOS	1554
COL	1502
HOU	1538
MIN	1547

```
SELECT teamID, SUM(H) FROM batting WHERE yearID = 2019 GROUP BY teamID  
HAVING SUM(H) > 1500 ORDER BY SUM(H) DESC;
```

teamID	SUM(H)
-----	-----
BOS	1554
MIN	1547
HOU	1538
COL	1502

[통산 병살타 순위 TOP10]

```
sqlite> SELECT playerID, sum(GIDP) as sum_gidp FROM batting GROUP BY playerID ORDER BY sum_gidp DE  
SC LIMIT 10;
```

playerID	sum_gidp
-----	-----
pujolal01	395
ripkeca01	350
rodriiv01	337
aaronha01	328
yastrca01	323
winfida01	319
cabremi01	318



qjqj7890

# SQL 문법 순서

SELECT 컬럼명

FROM 테이블명

WHERE 조건식

GROUP BY 컬럼명

HAVING 조건식

ORDER BY 컬럼명

ORDER BY가 WHERE 앞에 오면 안됨

```
sqlite> SELECT playerID, HR FROM batting ORDER BY HR WHERE yearID = 2019;  
Error: near "WHERE": syntax error
```

에러 발생

# CASE의 활용

조건에 따라 분기를 줘야할 경우에 사용

**2019년 탈삼진 개수로 선수들에게 등급을 줘보자**

< 250: S등급

< 200: A등급

< 150: B등급

< 100: C등급

나머지: F등급

```
SELECT yearID, playerID, SO,  
CASE  
WHEN SO > 250 THEN 'S'  
WHEN SO > 200 THEN 'A'  
WHEN SO > 150 THEN 'B'  
WHEN SO > 100 THEN 'C'  
ELSE 'F'  
END AS grade  
FROM pitching WHERE yearID = 2019 ORDER BY SO DESC LIMIT 200;
```

yearID	playerID	S0	grade
2019	colege01	326	S
2019	verlaju01	300	S
2019	biebesh01	259	S
2019	degroja01	255	S
2019	strasst01	251	S
2019	lynnla01	246	A
2019	scherma01	243	A
2019	mortoch02	240	A
2019	boydma01	238	A
2019	corbipa01	238	A
2019	rayro02	235	A
2019	flaheja01	231	A
2019	darviyu01	229	A
2019	nolaaa01	229	A
2019	giolilu01	228	A
2019	castilu02	226	A
2019	salech01	218	A
2019	buehlwa01	215	A
2019	rodried05	213	A
2019	grayso01	205	A
2019	bumgama01	203	A
2019	syndeno01	202	A
2019	minormi01	200	B
2019	berrijo01	195	B
2019	wheelza01	195	B
2019	kershcl01	189	B
2019	paxtoja01	186	B
2019	bauertr01	185	B
2019	odorija01	178	B
2019	marquge01	175	B
2019	friedma01	173	B
2019	clevimi01	169	B
2019	lopezre01	169	B
2019	maedake01	169	B
2019	smithca03	168	B
2019	desclan01	167	B
2019	lestejo01	165	B
2019	junisja01	164	B
2019	ryuhy01	163	B
2019	bundydy01	162	B
2019	teherju01	162	B
2019	gibsoky01	160	B
2019	kellyme01	158	B
2019	lucchjo01	158	B
2019	musgrjo01	157	B
2019	germado01	153	B
2019	matzst01	153	B

### Player Standard Pitching

Share & Export ▾

☒ Hide non-qualifiers for rate stats (min. 1 IP/G(IgAvg))

[Glossary](#)

[Show Partial Rows](#)


Rk	Name	Age	Tm	Lg	W	L	W-L%	ERA	G	GS	GF	CG	SHO	SV	IP	H	R	ER	HR	BB	IBB	SO ▼	HBP	BK	WP	BF	ERA+	FIP	WHIP	H9	HR9	BB9	SO9	SO/W
1	<a href="#">Gerrit Cole</a>	28	<a href="#">HOU</a>	AL	20	5	.800	2.50	33	33	0	0	0	0	212.1	142	66	59	29	48	0	326	3	3	4	817	185	2.64	0.895	6.0	1.2	2.0	13.8	6.79
2	<a href="#">Justin Verlander</a>	36	<a href="#">HOU</a>	AL	21	6	.778	2.58	34	34	0	2	1	0	223.0	137	66	64	36	42	0	300	6	0	4	847	179	3.27	0.803	5.5	1.5	1.7	12.1	7.14
3	<a href="#">Shane Bieber</a>	24	<a href="#">CLE</a>	AL	15	8	.652	3.28	34	33	1	3	2	0	214.1	186	86	78	31	40	1	259	6	1	6	859	144	3.32	1.054	7.8	1.3	1.7	10.9	6.48
4	<a href="#">Jacob deGrom</a>	31	<a href="#">NYM</a>	NL	11	8	.579	2.43	32	32	0	0	0	0	204.0	154	59	55	19	44	1	255	7	0	2	804	169	2.67	0.971	6.8	0.8	1.9	11.3	5.80
5	<a href="#">Trevor Bauer</a>	28	TOT	MLB	11	13	.458	4.48	34	34	0	1	1	0	213.0	184	118	106	34	82	0	253	19	0	10	911	105	4.34	1.249	7.8	1.4	3.5	10.7	3.09
6	<a href="#">Stephen Strasburg</a>	30	<a href="#">WSN</a>	NL	18	6	.750	3.32	33	33	0	0	0	0	209.0	161	79	77	24	56	4	251	10	0	8	841	135	3.25	1.038	6.9	1.0	2.4	10.8	4.48
7	<a href="#">Lance Lynn</a>	32	<a href="#">TEX</a>	AL	16	11	.593	3.67	33	33	0	0	0	0	208.1	195	89	85	21	59	0	246	8	0	18	875	141	3.13	1.219	8.4	0.9	2.5	10.6	4.17
8	<a href="#">Max Scherzer</a>	34	<a href="#">WSN</a>	NL	11	7	.611	2.92	27	27	0	0	0	0	172.1	144	59	56	18	33	2	243	7	0	0	693	154	2.45	1.027	7.5	0.9	1.7	12.7	7.36
9	<a href="#">Charlie Morton</a>	35	<a href="#">TBR</a>	AL	16	6	.727	3.05	33	33	0	0	0	0	194.2	154	71	66	15	57	0	240	12	1	5	790	144	2.81	1.084	7.1	0.7	2.6	11.1	4.21
10	<a href="#">Matthew Boyd*</a>	28	<a href="#">DET</a>	AL	9	12	.429	4.56	32	32	0	0	0	0	185.1	178	101	94	39	50	1	238	8	4	6	788	104	4.32	1.230	8.6	1.9	2.4	11.6	4.76
11	<a href="#">Patrick Corbin*</a>	29	<a href="#">WSN</a>	NL	14	7	.667	3.25	33	33	0	1	1	0	202.0	169	81	73	24	70	2	238	3	0	4	835	138	3.49	1.183	7.5	1.1	3.1	10.6	3.40
12	<a href="#">Robbie Ray*</a>	27	<a href="#">ARI</a>	NL	12	8	.600	4.34	33	33	0	0	0	0	174.1	150	91	84	30	84	5	235	5	0	7	747	103	4.29	1.342	7.7	1.5	4.3	12.1	2.80
13	<a href="#">Jack Flaherty</a>	23	<a href="#">STL</a>	NL	11	8	.579	2.75	33	33	0	0	0	0	196.1	135	62	60	25	55	2	231	7	0	6	772	152	3.46	0.968	6.2	1.1	2.5	10.6	4.20
14	<a href="#">Yu Darvish</a>	32	<a href="#">CHC</a>	NL	6	8	.429	3.98	31	31	0	0	0	0	178.2	140	82	79	33	56	1	229	11	0	11	731	111	4.18	1.097	7.1	1.7	2.8	11.5	4.09
15	<a href="#">Aaron Nola</a>	26	<a href="#">PHI</a>	NL	12	7	.632	3.87	34	34	0	0	0	0	202.1	176	91	87	27	80	3	229	11	0	3	852	115	4.03	1.265	7.8	1.2	3.6	10.2	2.86
16	<a href="#">Lucas Giolito</a>	24	<a href="#">CHW</a>	AL	14	9	.609	3.41	29	29	0	3	2	0	176.2	131	69	67	24	57	1	228	4	0	6	705	134	3.43	1.064	6.7	1.2	2.9	11.6	4.00
17	<a href="#">Luis Castillo</a>	26	<a href="#">CIN</a>	NL	15	8	.652	3.40	32	32	0	0	0	0	190.2	139	76	72	22	79	0	226	7	3	5	781	137	3.70	1.143	6.6	1.0	3.7	10.7	2.86
18	<a href="#">Chris Sale*</a>	30	<a href="#">BOS</a>	AL	6	11	.353	4.40	25	25	0	1	1	0	147.1	123	80	72	24	37	0	218	13	0	2	612	110	3.39	1.086	7.5	1.5	2.3	13.3	5.89
19	<a href="#">Walker Buehler</a>	24	<a href="#">LAD</a>	NL	14	4	.778	3.26	30	30	0	2	0	0	182.1	153	77	66	20	37	0	215	7	0	4	737	127	3.01	1.042	7.6	1.0	1.8	10.6	5.81
20	<a href="#">Eduardo Rodriguez*</a>	26	<a href="#">BOS</a>	AL	19	6	.760	3.81	34	34	0	0	0	0	203.1	195	88	86	24	75	2	213	7	0	3	859	128	3.86	1.328	8.6	1.1	3.3	9.4	2.84
21	<a href="#">Sonny Gray</a>	29	<a href="#">CIN</a>	NL	11	8	.579	2.87	31	31	0	0	0	0	175.1	122	59	56	17	68	1	205	7	1	7	708	162	3.42	1.084	6.3	0.9	3.5	10.5	3.01
22	<a href="#">Madison Bumgarner*</a>	29	<a href="#">SFG</a>	NL	9	9	.500	3.90	34	34	0	0	0	0	207.2	191	99	90	30	43	3	203	10	0	3	844	107	3.90	1.127	8.3	1.3	1.9	8.8	4.72
23	<a href="#">Noah Syndergaard</a>	26	<a href="#">NYM</a>	NL	10	8	.556	4.28	32	32	0	1	1	0	197.2	194	101	94	24	50	2	202	6	0	4	825	96	3.60	1.234	8.8	1.1	2.3	9.2	4.04
24	<a href="#">Mike Minor*</a>	31	<a href="#">TEX</a>	AL	14	10	.583	3.59	32	32	0	2	1	0	208.1	190	86	83	30	68	1	200	7	0	2	863	144	4.25	1.238	8.2	1.3	2.9	8.6	2.94
25	<a href="#">Jose Berrios</a>	25	<a href="#">MIN</a>	AL	14	8	.636	3.68	32	32	0	1	0	0	200.1	194	94	82	26	51	0	195	9	1	8	842	123	3.85	1.223	8.7	1.2	2.3	8.8	3.82
26	<a href="#">Zack Wheeler</a>	29	<a href="#">NYM</a>	NL	11	8	.579	3.96	31	31	0	0	0	0	195.1	196	93	86	22	50	4	195	2	0	5	828	103	3.48	1.259	9.0	1.0	2.3	9.0	3.90
27	<a href="#">Clayton Kershaw*</a>	31	<a href="#">LAD</a>	NL	16	5	.762	3.03	29	28	0	0	0	0	178.1	145	63	60	28	41	0	189	2	1	7	706	137	3.86	1.043	7.3	1.4	2.1	9.5	4.61
28	<a href="#">Zack Greinke</a>	35	TOT	MLB	18	5	.783	2.93	33	33	0	0	0	0	208.2	175	73	68	21	30	2	187	4	1	2	810	154	3.22	0.982	7.5	0.9	1.3	8.1	6.23
29	<a href="#">James Paxton*</a>	30	<a href="#">NYY</a>	AL	15	6	.714	3.82	29	29	0	0	0	0	150.2	138	71	64	23	55	0	186	2	1	7	633	116	3.86	1.281	8.2	1.4	3.3	11.1	3.38
30	<a href="#">Jake Odorizzi</a>	29	<a href="#">MIN</a>	AL	15	7	.682	3.51	30	30	0	0	0	0	159.0	139	65	62	16	53	0	178	4	0	4	658	129	3.36	1.208	7.9	0.9	3.0	10.1	3.36



# CASE의 활용

2019년 FIP로 규정 이닝 이상 던진 투수들을 등급매겨보자(2019 cFIP = 3.214)

<https://www.fangraphs.com/guts.aspx?type=cn>

 Fielding Independent Pitching (FIP)	
Rating	FIP
Excellent	3.20
Great	3.50
Above Average	3.80
Average	4.20
Below Average	4.40
Poor	4.70
Awful	5.00
Based on 2016 Run Environment	

<https://library.fangraphs.com/pitching/fip/>

# CASE의 활용




Max Scherzer

Position: Pitcher

Bats: Right • Throws: Right

6-3, 208lb (190cm, 94kg)

Team: [New York Mets](#) (majors, 15-day IL)

Born: [July 27, 1984](#) (Age: 37-302d) in [St. Louis, MO](#) 

Draft: Drafted by the [St. Louis Cardinals](#) in the 43rd round of

```
SELECT
  t.playerID,
  t.FIP,
  CASE
    WHEN t.FIP <= 3.2 THEN 'Excellent'
    WHEN t.FIP <= 3.5 THEN 'Great'
    WHEN t.FIP <= 3.8 THEN 'Above Average'
    WHEN t.FIP <= 4.2 THEN 'Average'
    WHEN t.FIP <= 4.4 THEN 'Below Average'
    WHEN t.FIP <= 4.7 THEN 'Poor'
    ELSE 'Awful'
  END AS grade
FROM
  (SELECT playerID, (13*HR + 3*BB + 3*HBP -
    2*SO)/(IPouts/3.0) + 3.214 AS FIP
  FROM pitching WHERE yearID = 2019 AND
    IPouts/3.0 >= 162) AS t
ORDER BY t.FIP;
```

playerID	FIP	grade
scherma01	2.44804255319149	Excellent
colege01	2.639431711146	Excellent
degroja01	2.67478431372549	Excellent
mortoch02	2.81331506849315	Excellent
buehlwa01	3.00559049360146	Excellent
ryuhy01	3.09903649635036	Excellent
lynnla01	3.1276	Excellent
strasst01	3.25227751196172	Great
verlaju01	3.26781165919283	Great
biebesh01	3.32130948678072	Great
grayso01	3.41932319391635	Great
giolilu01	3.43475471698113	Great
sorokmi01	3.45445801526718	Great
flaheja01	3.46357555178268	Great
wheelza01	3.48021160409556	Great
corbipa01	3.48627722772277	Great
syndeno01	3.59848566610455	Above Aver
hendrky01	3.6094802259887	Above Aver
castilu02	3.69651748251748	Above Aver
friedma01	3.7150060362173	Above Aver
quintjo01	3.79879532163743	Above Aver
musgrjo01	3.81869667318982	Average
berrijo01	3.85293510815308	Average
kershcl01	3.85885981308411	Average
rodried05	3.86318032786885	Average
bungama01	3.90260353130016	Average
nolaaa01	4.03442833607908	Average
marquge01	4.0588275862069	Average
gonzama02	4.15488669950739	Average
lucchjo01	4.17326680244399	Average
darviyu01	4.17668656716418	Average
minormi01	4.246	Below Aver
lestejo01	4.25671844660194	Below Aver
tanakma01	4.26894505494506	Below Aver
mikolmi01	4.27378260869565	Below Aver
rayro02	4.28665774378585	Below Aver
boydma01	4.32011510791367	Below Aver
kellebr01	4.35109677419355	Below Aver
wainwad01	4.35574757281553	Below Aver
desclan01	4.426	Poor
sanchan01	4.4429156626506	Poor
mileywa01	4.51081274900398	Poor
kellyme01	4.51218181818182	Poor
alcansa01	4.55183783783784	Poor
anderbr04	4.57195454545455	Poor
samarje01	4.58716176470588	Poor
perezma02	4.65956451612903	Poor
teherju01	4.66247328244275	Poor
porceri01	4.76275717017208	Awful
junisja01	4.82236501901141	Awful
eflinza01	4.85481632653061	Awful
hudsoda02	4.9258320610687	Awful
fiersmi01	4.96851263537906	Awful
novaiv01	4.97870588235294	Awful
lopezre01	5.04008695652174	Awful

# LIKE의 활용

MLB에서 뭘 한국에서 태어난 선수들을 검색하고 싶음.

그런데 한국이 Korea로 들어가 있을 지,  
Republic of Korea로 들어가 있을 지,  
South Korea로 들어가 있을 지는 모르는 상황.

어쨌든 Korea는 들어가 있을 것으로 예상됨.

이런 상황에 LIKE를 사용할 수 있음.

```
SELECT * FROM people WHERE birthCountry LIKE '%Korea%';
```

여기서 %는 무엇이든 허용한다는 뜻

playerID	birthYear	birthMonth	birthDay	birthCountry	birthState	birthCity	deathYear	deathMonth	deathDay	deathCountry	deathState	deathCity	nameFirst	nameLast	nameGiven	weight	height	ba
ts	throws	debut	finalGame	retroID	bbrefID	birth_date	debut_date	finalgame_date	death_date									
baekch01		1980	5	29	South Korea	Busan	Busan						Cha-Seung	Baek	Cha-Seung	190	76	R
	R	2004-08-08	2008-09-28	baekc001	baekch01	1980-05-29	2004-08-08	2008-09-28										
bongju01		1980	7	15	South Korea	Seoul	Seoul						Jung	Bong	Jung Keun	175	75	L
	L	2002-04-23	2004-06-20	bongj001	bongju01	1980-07-15	2002-04-23	2004-06-20										
choihe01		1979	3	16	South Korea	South Jeol	Hwasun						Hee-Seop	Choi	Hee-Seop	235	77	L
	L	2002-09-03	2005-10-02	choih001	choihe01	1979-03-16	2002-09-03	2005-10-02										
choiji01		1991	5	19	South Korea	Incheon	Incheon						Ji-Man	Choi	Ji-Man	250	73	L
	R	2016-04-05	2019-09-29	choij001	choiji01	1991-05-19	2016-04-05	2019-09-29										
choji01		1975	8	16	South Korea	North Jeol	Jeonju						Jin Ho	Cho	Jin Ho	175	72	R
	R	1998-07-04	1999-07-30	cho-j001	choji01	1975-08-16	1998-07-04	1999-07-30										
choosh01		1982	7	13	South Korea	Busan	Busan						Shin-Soo	Choo	Shin-Soo	210	71	L

## LIKE의 활용

레먼데이터베이스에서 teamID는 3글자로 구성되어 있음.  
BAL, DET, WAS, HOU, TOR 등.  
teamID가 T로 시작하는 팀들을 조회하고 싶을 때는  
teamID LIKE 'T\_'를 사용할 수 있음.

```
SELECT yearID, teamID, name FROM teams WHERE yearID = 2019 and teamID LIKE 'T_';
```

언더바(\_) 두번

yearID	teamID	name
2019	TBA	Tampa Bay Rays
2019	TEX	Texas Rangers
2019	TOR	Toronto Blue J

## 아메리칸리그

### 1. 동부

- 볼티모어 오리올스, Baltimore Orioles, BAL
- 보스턴 레드삭스, Boston Red Sox, BOS
- 뉴욕 양키스, New York Yankees, NYA
- 탬파베이 레이스, Tampa Bay Rays, TBA
- 토론토 블루제이스, Toronto Blue Jays, TOR

### 2. 중부

- 시카고 화이트삭스, Chicago White Sox, CHA
- 클리블랜드 가디언스, Cleveland Guardians, CLE: 2021년까지 "클리블랜드 인디언스"였음
- 디트로이트 타이거스, Detroit Tigers, DET
- 캔자스시티 로열스, Kansas City Royals, KCA
- 미네소타 트윈스, Minnesota Twins, MIN

### 3. 서부

- 휴스턴 애스트로스, Houston Astros, HOU
- 로스앤젤레스 에인절스, Los Angeles Angels, LAA
- 오클랜드 애슬레틱스, Oakland Athletics, OAK
- 시애틀 매리너스, Seattle Mariners, SEA
- 텍사스 레인저스, Texas Rangers, TEX

## 내셔널리그

### 1. 동부

- 애틀랜타 브레이브스, Atlanta Braves, ATL
- 마이애미 말린스, Miami Marlins, MIA
- 뉴욕 메츠, New York Mets, NYN
- 필라델피아 필리스, Philadelphia Phillies, PHI
- 워싱턴 내셔널스, Washington Nationals, WAS

### 2. 중부

- 시카고 컵스, Chicago Cubs, CHN
- 신시내티 레즈, Cincinnati Reds, CIN
- 밀워키 브루어스, Milwaukee Brewers, MIL
- 피츠버그 파이리츠, Pittsburgh Pirates, PIT
- 세인트루이스 카디널스, St. Louis Cardinals, SLN

### 3. 서부

- 애리조나 다이아몬드백스, Arizona Diamondbacks, ARI
- 콜로라도 로키스, Colorado Rockies, COL
- 로스앤젤레스 다저스, Los Angeles Dodgers, LAN
- 샌디에이고 파드리스, San Diego Padres, SDN
- 샌프란시스코 자이언츠, San Francisco Giants, SFN

# DISTINCT의 활용

중복된 것은 1개씩만 보여주고 싶을 때

MLB에서 역대 댄 선수들의 출생국가를 조회해보자

```
SELECT birthCountry FROM people;
```

이렇게 하면 중복된 국가가 엄청나게 많이 조회됨

```
SELECT DISTINCT birthCountry FROM people;
```

```
SELECT COUNT(DISTINCT birthCountry) FROM people;
```

```
sqlite> SELECT COUNT(DISTINCT birthCountry) FROM people;
```

57

57개 국가에서 태어난 선수들이 MLB에 입성했음

Russia  
Curacao  
Colombia  
Nicaragua  
Germany  
Norway  
Japan  
Ireland  
Italy  
Bahamas  
United Kingdom  
South Korea  
Australia  
Czech Republic  
V.I.  
Netherlands  
France  
Aruba  
  
Sweden  
Hong Kong  
Afghanistan  
Spain  
Greece  
Taiwan  
Philippines  
Jamaica  
Poland  
Honduras  
Brazil  
Viet Nam  
Guam  
Denmark  
Switzerland  
Austria  
Singapore  
China  
Belgium  
Peru  
Belize  
Indonesia  
Finland  
Lithuania  
South Africa  
At Sea  
Slovakia  
American Samoa  
Saudi Arabia  
Portugal  
Latvia

# 문자열 합치기

두 컬럼의 문자열을 연결해서 보여주고 싶을 때

**컬럼명 || 컬럼명**

```
sqlite> SELECT nameFirst || ' ' || nameLast as name FROM people LIMIT 10;  
name  
-----  
David Aardsma  
Hank Aaron  
Tommy Aaron  
Don Aase  
Andy Abad  
Fernando Abad  
John Abadie  
Ed Abbaticchi  
Bert Abbey  
Charlie Abbey
```

# Quiz

2019년 teamID가 A로 끝나는 팀 선수 중 BABIP이 좋은 타자 5명의 데이터를 조회하시오.  
다음과 똑같이 출력되게 할 것.

playerID	teamID	name	BABIP
moncayo01	CHA <small>Chicago White Sox</small>	Yoan Moncada	0.405970149253731
anderti01	CHA	Tim Anderson	0.399463806970509
garcile02	CHA	Leury Garcia	0.353348729792148
merriwh01	KCA <small>Kansas City Royals</small>	Whit Merrifi	0.349907918968692
lemahdj01	NYA <small>New York Yankees</small>	DJ LeMahieu	0.348979591836735

참고로 지금까지의 내용을 완벽히 이해하지 않았다면 어렵습니다...ㅠㅠ



# TRY

오늘 배운 내부 조인, 서브쿼리, IN, BETWEEN ... AND ..., GROUP BY, CASE, LIKE, DISTINCT 등을 활용해서 데이터 조회하기(총 5개)