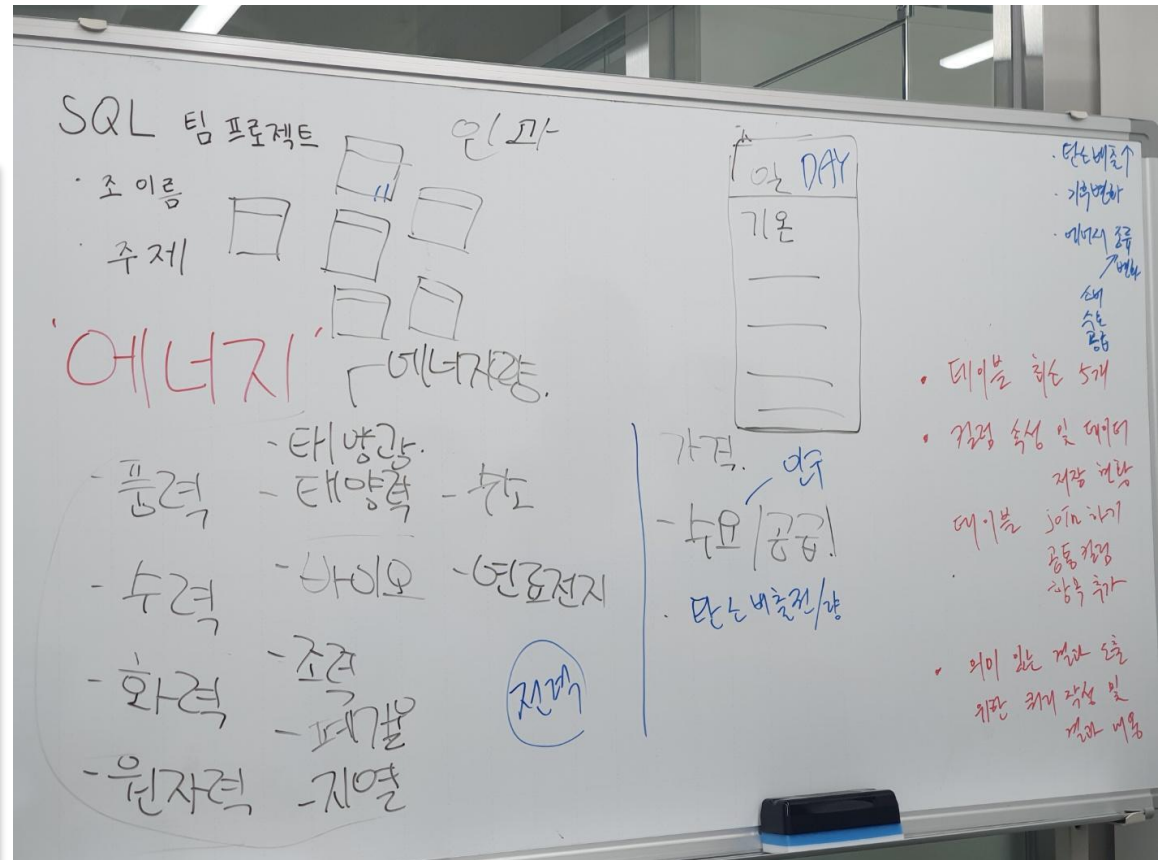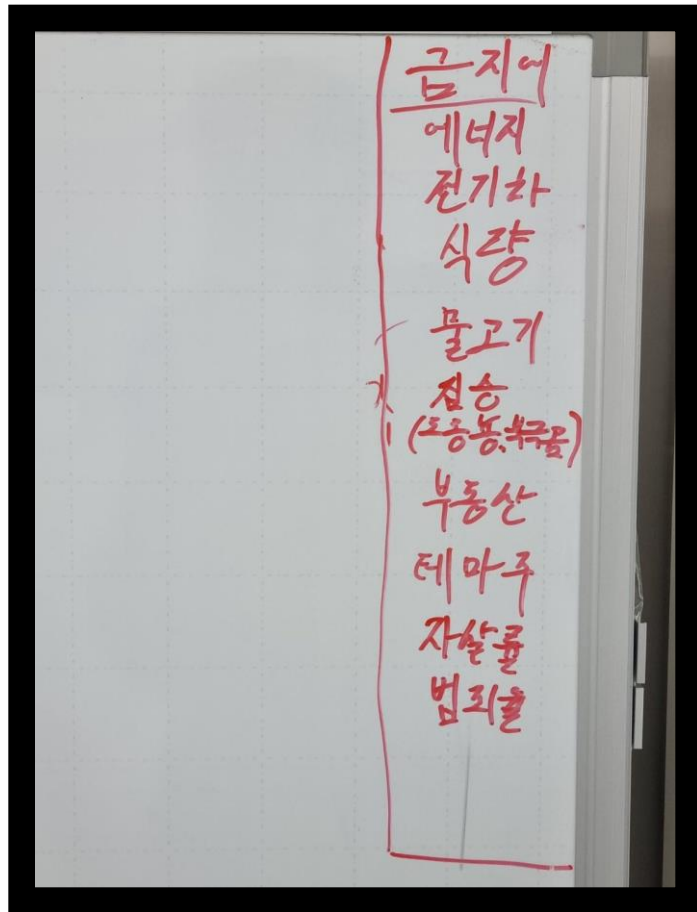# SQL Project

기후 변화와 산림

발표 조: '다됐조'[::-1]
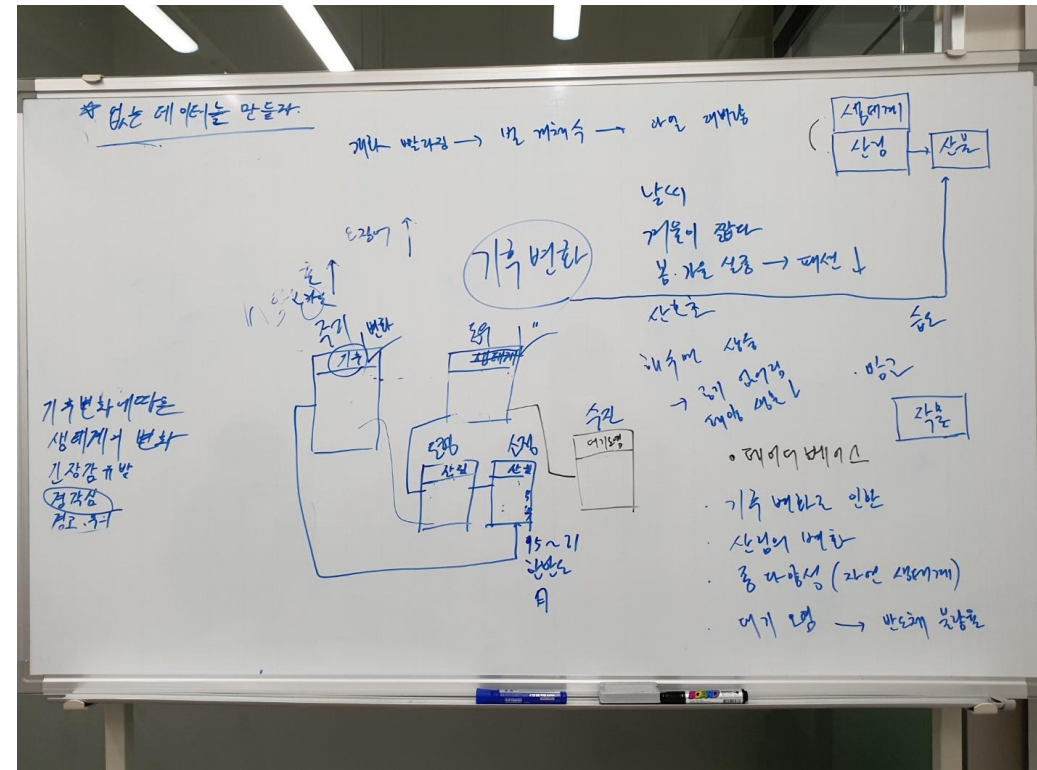
1) 주제

- 주제 선정에 난항을 겪음

2) 브레인스토밍

- 프로젝트 최우선 목표: ***DB 설계 및 구축***
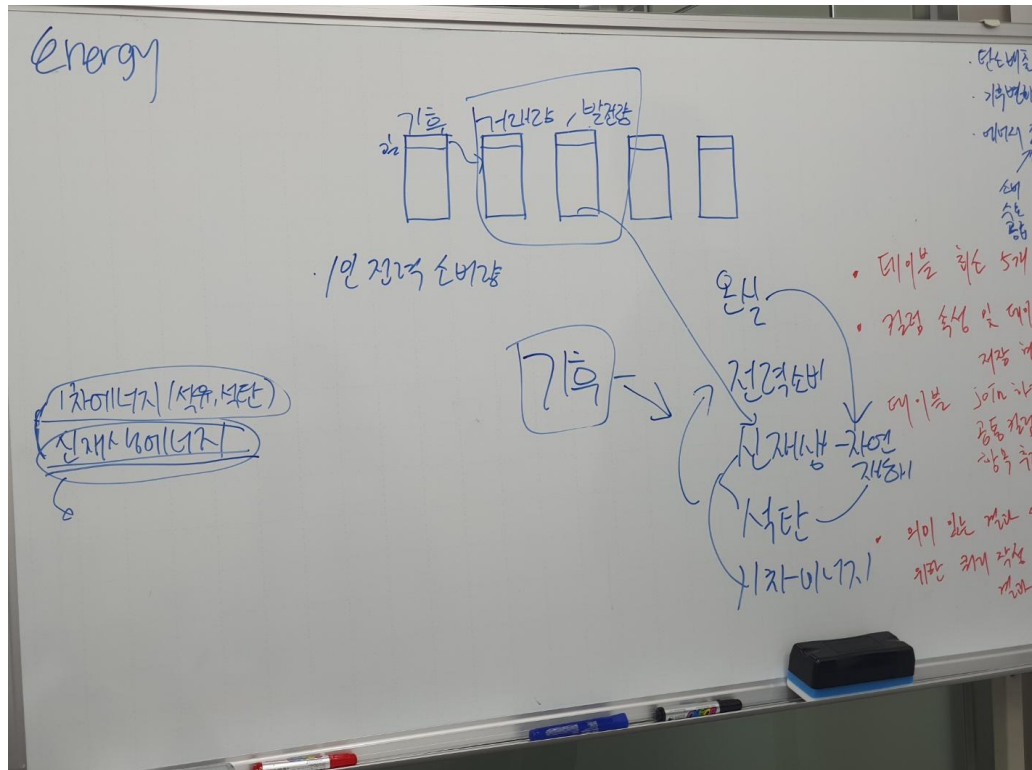
2) 브레인스토밍

- 데이터 모델링을 위한 *__Entity: 추후 설명__*

3. 과정

- 데이터 수집

통계청: **https://kostat.go.kr**
산림청: **https://www.forest.go.kr**
기상청: **https://www.weather.go.kr**
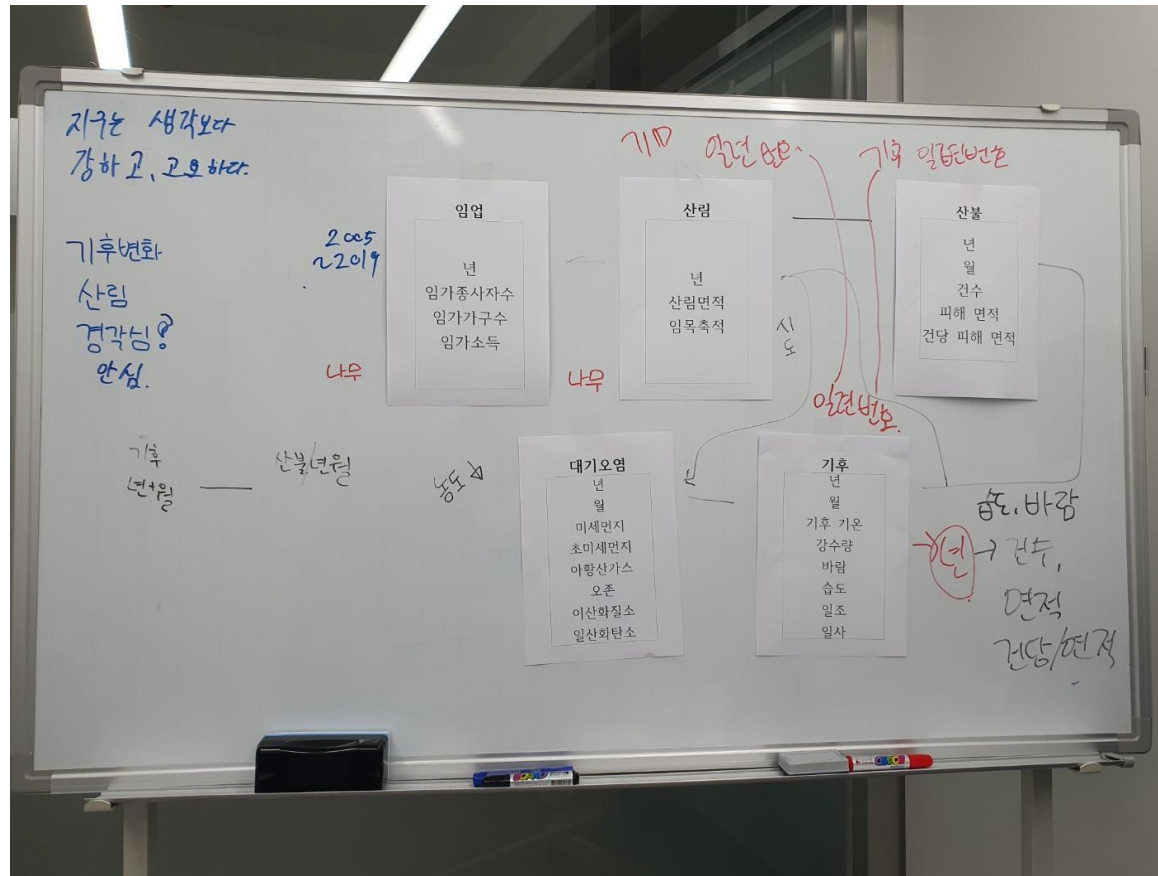
3. 과정

- 수집한 데이터 전처리

CSV 파일에서 필요한 부분만 수집

3. 과정

- 수집한 데이터 -> 구글 드라이브에 공유

*ERD 설계

필요 Entity 뽑기

기후
- 년
- 지역
- 기온
- 강수량
- 바람
- 습도

산불
- 년
- 지역
- 건수
- 피해 면적
- 피해액

산림
- 년
- 지역
- 산림면적
- 임목축적

임업
- 년
- 지역
- 임업 종사자수
- 임가소득

*ERD 설계

ERD 그리기

*ERD 설계

테이블명: code_id	지역과 연도에 관한 테이블	
칼럼 명	데이터 타입	설명
code_id	smallint, PK	일련번호
local	varchar(50)	지역명
year	int	연도

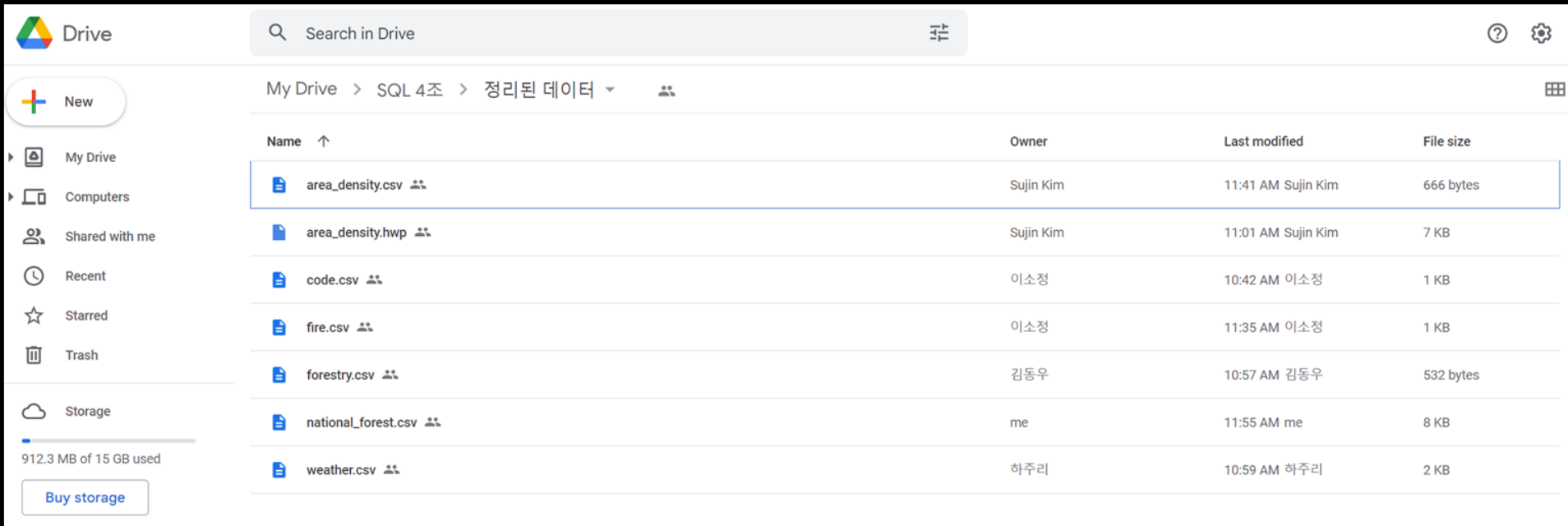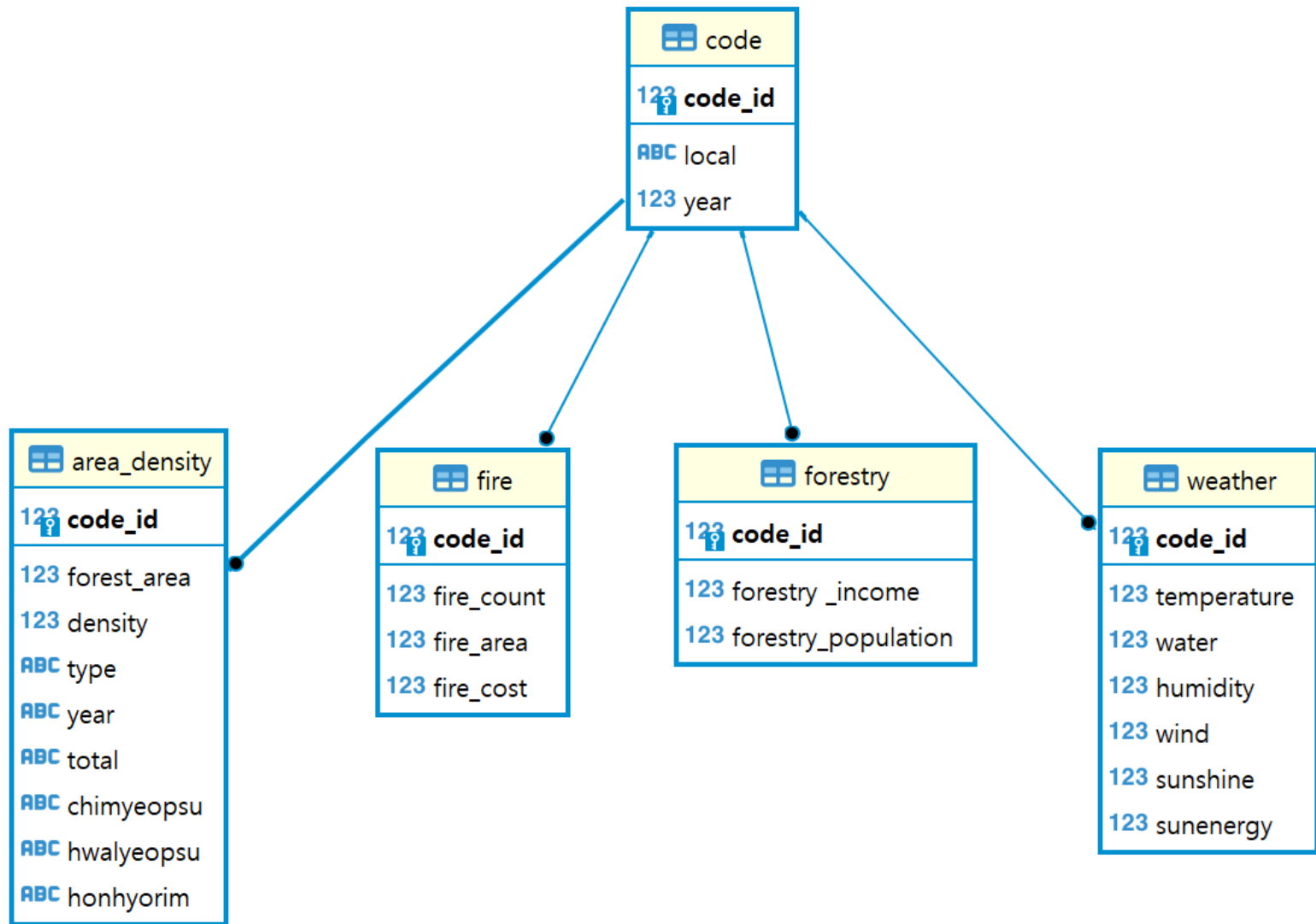| 테이블명: forestry	임업에 관한 테이블	
컬럼 명	자료형	설명
code_id	smallint ,PK,FK	일련번호
forestry_income	double	임가소득
forestry_population	double	임업종사자 수

테이블명: fire	산불에 관한 테이블	
칼럼 명	데이터 타입	설명
code_id	smalint, PK, FK	일련번호
fire_count	int	발생 건수
fire_area	int	피해 면적(ha)
fies_cost	int	피해액

area_density

테이블명: area_density_gangwon_gyeongsang	산불	
칼럼 명	데이터 타입	설명
code_id	smallint , PK, FK	일련번호
forest_area	int	산림면적 (ha)
density	int	산림축적 (㎥)

테이블명: weather	기후	
칼럼 명	데이터 타입	설명
code_id	smallint, PK, FK	일련번호
temperature	int	평균기온(℃)
water	int	평균강수량(mm)
humidity	int	평균습도(%rh)
wind	int	평균풍속(m/s)
sunshine	int	일조합(hr)
sunenergy	int	일사합(MJ/m2)

*DB 설계

```sql
1   use team4;
2
3   select *
4   from code;
5
6   /* 데이터 타입 변경 */
7   alter table code modify code_id smallint;
8   /* pk 설정 */
9   alter table code add constraint code_pk primary key (code_id);
10
11  /* fire table */
12  alter table fire modify code_id smallint not null;
13
14  alter table fire add constraint fire_fk
15      foreign key (code_id) references code(code_id);
16
17  alter table fire add constraint fire_pk primary key (code_id);
18
19  /* 기후 데이터 타입 변경, pk 설정 fk 설정 */
20  alter table weather modify code_id smallint not null;
21  alter table weather add constraint weather_fk
22      foreign key (code_id) references code(code_id);
23  alter table weather add constraint weather_pk primary key (code_id);
24
25  /* 산림 데이터 변경 */
26  alter table area_density modify code_id smallint not null;
27  alter table area_density add constraint area_density primary key (code_id);
28  alter table area_density add constraint ad_fk
29      foreign key (code_id) references code(code_id);
30
31  /* forestry 데이터 변경 */
32  alter table forestry modify code_id smallint not null;
33  alter table forestry add constraint forestry_fk
34      foreign key (code_id) references code(code_id);
35  alter table forestry add constraint forestry_pk primary key (code_id);
36
37
```

하주리

Table 1

#	code_id	local	year
1	1	gyeongsang	1,995
2	2	gyeongsang	1,996
3	3	gyeongsang	1,997
4	4	gyeongsang	1,998
5	5	gyeongsang	1,999
6	6	gyeongsang	2,000
7	7	gyeongsang	2,001
8	8	gyeongsang	2,002
9	9	gyeongsang	2,003
10	10	gyeongsang	2,004
11	11	gyeongsang	2,005
12	12	gyeongsang	2,006
13	13	gyeongsang	2,007
14	14	gyeongsang	2,008
15	15	gyeongsang	2,009
16	16	gyeongsang	2,010
17	17	gyeongsang	2,011
18	18	gyeongsang	2,012
19	19	gyeongsang	2,013
20	20	gyeongsang	2,014
21	21	gyeongsang	2,015
22	22	gyeongsang	2,016
23	23	gyeongsang	2,017
24	24	gyeongsang	2,018
25	25	gyeongsang	2,019
26	26	gyeongsang	2,020
27	27	gyeongsang	2,021
28	28	gyeongsang	2,022
29	29	gangwon	1,995
30	30	gangwon	1,996
31	31	gangwon	1,997
32	32	gangwon	1,998
33	33	gangwon	1,999
34	34	gangwon	2,000
35	35	gangwon	2,001
36	36	gangwon	2,002
37	37	gangwon	2,003
38	38	gangwon	2,004
39	39	gangwon	2,005
40	40	gangwon	2,006
41	41	gangwon	2,007
42	42	gangwon	2,008

Table 2

#	code_id	temperature	water	humidity	wind	sunshine	sunenergy
1	1	12.5	864.6	64.5	2.15	2,453.45	4,910.855
2	2	12.65	998.6	65.5	2.05	2,336.55	4,496.635
3	3	13.3	1,315.95	65.5	2	2,365.15	4,688.935
4	4	13.9	1,770.3	66.5	2	2,030.2	4,241.035
5	5	13.1	1,715.85	63.5	2.05	2,278.5	4,592.56
6	6	13.05	1,255.7	61.5	2	2,179	4,942.08
7	7	13.15	1,033.2	61.5	1.9	2,258.45	4,970.415
8	8	12.95	1,603.6	63.5	2.1	2,227	5,206.425
9	9	12.85	1,949.35	67	1.9	1,975.15	4,515.62
10	10	13.75	1,424.75	63	2	2,384.5	5,015.17
11	11	12.85	1,176.3	62.5	2.1	2,382.95	5,256.22
12	12	13.3	1,433.7	66	2	2,119.9	4,831.415
13	13	13.8	1,354.9	66.5	1.95	2,106.7	5,118.32
14	14	13.35	877.75	65	2.05	2,307.95	5,452.63
15	15	13.55	1,085.95	62.5	2.05	2,212.35	5,339.165
16	16	13.1	1,335.2	65.5	2.05	2,229.35	5,185.65
17	17	13	1,466.65	63.5	2.1	2,220.65	5,165.89
18	18	12.8	1,498.8	63.5	2.1	2,407.1	5,268.35
19	19	13.5	1,084.1	63	2.05	2,549.8	5,445.965
20	20	13.45	1,321.9	64.5	1.95	2,347.85	4,754.195
21	21	13.75	1,018.7	66.5	1.95	2,390.2	4,876.65
22	22	14	1,439.65	67	1.9	2,387.35	4,826.78
23	23	13.65	827.3	62	1.9	2,676.7	5,069.12
24	24	13.5	1,453.25	65	1.9	2,557.65	4,495.305
25	25	14	1,376.4	66	1.75	2,532.45	5,510.8
26	26	13.6	1,630.15	68.5	1.8	2,475.35	5,514.915
27	27	13.85	1,343.85	69	1.75	2,451.55	5,504.36
28	28	13.65	919.95	64.5	1.8	2,589.55	5,779.91
29	29	11.3	1,253.8	68	1.95	2,154.85	4,636.85
30	30	11.05	1,160.95	69.5	1.85	2,060.25	4,562.425
31	31	11.85	1,327.75	66.5	1.9	2,219.95	4,637.79
32	32	12.75	1,699.35	68.5	2.05	1,947.9	4,197.845
33	33	12.3	1,682.35	65	2.15	2,220.7	4,496.385
34	34	11.85	1,197.3	63	2.05	2,016.15	4,377.93
35	35	11.8	1,055.45	61	1.95	2,058.25	4,703.02
36	36	11.8	1,562.65	62	2	2,017.2	4,695.04
37	37	11.55	1,910.2	67	1.9	1,782.1	4,515.695
38	38	12.6	1,514.95	62.5	2.1	2,180.35	5,037.36
39	39	11.6	1,484.55	61.5	2.1	2,170.65	5,100.31
40	40	11.95	1,753.05	65	2.05	1,842.25	4,737.955
41	41	12.55	1,359.95	66	2	1,827.15	4,630.245
42	42	12.35	1,280.3	64.5	2	2,078.3	5,009.45

기후 변화 확인하기

- 기후 속성(기온, 강수량, 습도, 풍속, 일조합, 일사합) 순으로 정렬해서 최근으로 올수록 일정하게 변화하는 값이 있는지 확인함.

2016,2019

```
17  # 기후 변화 확인
18  # 경상
19  select c.year, w.temperature
20  from weather as w
21      inner join code as c
22      on w.code_id=c.code_id
23  where c.local='gyeongsang'
24  order by w.temperature desc;  # 기온 2019,2016 최고 / 1995, 1996 최저
25
26  # 강원도
27  select c.year, w.temperature
28  from weather as w
29      inner join code as c
30      on w.code_id=c.code_id
31  where c.local='gangwon'
32  order by w.temperature desc;  # 기온 2015,2016 최고 / 1995, 1996 최저
```

1995,1996

기온 순으로 정렬(경상도)

	year	temperature
1	2,016	14
2	2,019	14
3	1,998	13.9
4	2,021	13.85
5	2,007	13.8
6	2,004	13.75
7	2,015	13.75
8	2,017	13.65
9	2,022	13.65
10	2,020	13.6
11	2,009	13.55
12	2,013	13.5
13	2,018	13.5
14	2,014	13.45
15	2,008	13.35
16	1,997	13.3
17	2,006	13.3
18	2,001	13.15
19	1,999	13.1
20	2,010	13.1
21	2,000	13.05
22	2,011	13
23	2,002	12.95
24	2,003	12.85
25	2,005	12.85
26	2,012	12.8
27	1,996	12.65
28	1,995	12.5

기온 순으로 정렬(강원도)

2015,2016

	year	temperature
1	2,015	12.85
2	2,016	12.8
3	1,998	12.75
4	2,014	12.7
5	2,004	12.6
6	2,007	12.55
7	2,017	12.45
8	2,008	12.35
9	1,999	12.3
10	2,009	12.25
11	2,018	12.25
12	2,013	12.2
13	2,019	12.05
14	2,006	11.95
15	1,997	11.85
16	2,000	11.85
17	2,010	11.85
18	2,021	11.85
19	2,001	11.8
20	2,002	11.8
21	2,020	11.75
22	2,005	11.6
23	2,003	11.55
24	2,011	11.5
25	2,012	11.5
26	2,022	11.45
27	1,995	11.3
28	1,996	11.05

1996,1995

기후 변화 확인하기

강수량 정렬(경상도)		강수량 정렬(강원도)		습도 정렬(경상도)		습도 정렬(강원도)		풍속 정렬(경상도)		풍속 정렬(강원도)	
year	water	year	water	year	humidity	year	humidity	year	wind	year	wind
2,003	1,949.35	2,003	1,910.2	2,021	69	1,996	69.5	1,995	2.15	1,999	2.15
1,998	1,770.3	2,011	1,821.1	2,020	68.5	1,998	68.5	2,002	2.1	2,004	2.1
1,999	1,715.85	2,006	1,753.05	2,003	67	1,995	68	2,005	2.1	2,005	2.1
2,020	1,630.15	1,998	1,699.35	2,016	67	2,021	68	2,011	2.1	1,998	2.05
2,002	1,603.6	1,999	1,682.35	1,998	66.5	2,020	67.5	2,012	2.1	2,000	2.05
2,012	1,498.8	2,020	1,678.8	2,007	66.5	2,003	67	1,996	2.05	2,006	2.05
2,011	1,466.65	2,002	1,562.65	2,015	66.5	1,997	66.5	1,999	2.05	2,002	2
2,018	1,453.25	2,004	1,514.95	2,006	66	2,007	66	2,008	2.05	2,007	2
2,016	1,439.65	2,018	1,493.3	2,019	66	2,013	66	2,009	2.05	2,008	2
2,006	1,433.7	2,022	1,485.4	1,996	65.5	2,022	65.5	2,010	2.05	2,009	2
2,004	1,424.75	2,005	1,484.55	1,997	65.5	1,999	65	2,013	2.05	1,995	1.95
2,019	1,376.4	2,009	1,369.55	2,010	65.5	2,006	65	1,997	2	2,001	1.95
2,007	1,354.9	2,007	1,359.95	2,008	65	2,014	65	1,998	2	2,012	1.95
2,021	1,343.85	1,997	1,327.75	2,018	65	2,008	64.5	2,000	2	1,997	1.9
2,010	1,335.2	2,010	1,309.5	1,995	64.5	2,010	64.5	2,004	2	2,003	1.9
2,014	1,321.9	2,008	1,280.3	2,014	64.5	2,015	64.5	2,006	2	2,010	1.9
1,997	1,315.95	2,012	1,260.35	2,022	64.5	2,016	64.5	2,007	1.95	2,013	1.9
2,000	1,255.7	1,995	1,253.8	1,999	63.5	2,019	64.5	2,014	1.95	1,996	1.85
2,005	1,176.3	2,013	1,243.65	2,002	63.5	2,011	64	2,015	1.95	2,011	1.85
2,009	1,085.95	2,000	1,197.3	2,011	63.5	2,012	64	2,001	1.9	2,014	1.85
2,013	1,084.1	2,016	1,193.25	2,012	63.5	2,009	63.5	2,003	1.9	2,015	1.85
2,001	1,033.2	1,996	1,160.95	2,004	63	2,000	63	2,016	1.9	2,018	1.8
2,015	1,018.7	2,017	1,157.85	2,013	63	2,004	62.5	2,017	1.9	2,020	1.8
1,996	998.6	2,019	1,154.7	2,005	62.5	2,002	62	2,018	1.9	2,016	1.75
2,022	919.95	2,021	1,135.15	2,009	62.5	2,018	62	2,020	1.8	2,017	1.75
2,008	877.75	2,001	1,055.45	2,017	62	2,005	61.5	2,022	1.8	2,021	1.75
1,995	864.6	2,014	984.15	2,000	61.5	2,001	61	2,019	1.75	2,022	1.75
2,017	827.3	2,015	938.45	2,001	61.5	2,017	60.5	2,021	1.75	2,019	1.7

기후 변화 확인하기

일조량 정렬(경상도) — 2017,2022

#	year	sunshine
1	2,017	2,676.7
2	2,022	2,589.55
3	2,018	2,557.65
4	2,013	2,549.8
5	2,019	2,532.45
6	2,020	2,475.35
7	1,995	2,453.45
8	2,021	2,451.55
9	2,012	2,407.1
10	2,015	2,390.2
11	2,016	2,387.35
12	2,004	2,384.5
13	2,005	2,382.95
14	1,997	2,365.15
15	2,014	2,347.85
16	1,996	2,336.55
17	2,008	2,307.95
18	1,999	2,278.5
19	2,001	2,258.45
20	2,010	2,229.35
21	2,002	2,227
22	2,011	2,220.65
23	2,009	2,212.35
24	2,000	2,179
25	2,006	2,119.9
26	2,007	2,106.7
27	1,998	2,030.2
28	2,003	1,975.15

일조량 정렬(강원도) — 2019,2018

#	year	sunshine
1	2,019	2,532.35
2	2,018	2,474.45
3	2,015	2,466.1
4	2,022	2,447.15
5	2,017	2,428.8
6	2,020	2,384.25
7	2,021	2,376.4
8	2,013	2,332.05
9	2,014	2,326.5
10	2,016	2,257.35
11	1,999	2,220.7
12	1,997	2,219.95
13	2,004	2,180.35
14	2,005	2,170.65
15	1,995	2,154.85
16	2,012	2,138
17	2,008	2,078.3
18	1,996	2,060.25
19	2,009	2,059.6
20	2,001	2,058.25
21	2,002	2,017.2
22	2,000	2,016.15
23	2,011	1,996.85
24	1,998	1,947.9
25	2,010	1,892.25
26	2,006	1,842.25
27	2,007	1,827.15
28	2,003	1,782.1

일사량 정렬(경상도) — 2022,2020

#	year	sunenergy
1	2,022	5,779.91
2	2,020	5,514.915
3	2,019	5,510.8
4	2,021	5,504.36
5	2,008	5,452.63
6	2,013	5,445.965
7	2,009	5,339.165
8	2,012	5,268.35
9	2,005	5,256.22
10	2,002	5,206.425
11	2,010	5,185.65
12	2,011	5,165.89
13	2,007	5,118.32
14	2,017	5,069.12
15	2,004	5,015.17
16	2,001	4,970.415
17	2,000	4,942.08
18	1,995	4,910.855
19	2,015	4,876.65
20	2,006	4,831.415
21	2,016	4,826.78
22	2,014	4,754.195
23	1,997	4,688.935
24	1,999	4,592.56
25	2,003	4,515.62
26	1,996	4,496.635
27	2,018	4,495.305
28	1,998	4,241.035

일사량 정렬(강원도) — 2018,2017

#	year	sunenergy
1	2,018	5,349.805
2	2,017	5,296.59
3	2,022	5,281.16
4	2,019	5,274.055
5	2,021	5,193.47
6	2,020	5,163.81
7	2,015	5,125.82
8	2,005	5,100.31
9	2,004	5,037.36
10	2,012	5,021.71
11	2,008	5,009.45
12	2,016	5,000.085
13	2,009	4,990.73
14	2,013	4,841.905
15	2,011	4,789.58
16	2,010	4,751.535
17	2,006	4,737.955
18	2,001	4,703.02
19	2,002	4,695.04
20	2,014	4,657.82
21	1,997	4,637.79
22	1,995	4,636.85
23	2,007	4,630.245
24	1,996	4,562.425
25	2,003	4,515.695
26	1,999	4,496.385
27	2,000	4,377.93
28	1,998	4,197.845

일조량 : 일정한 물체의 표면이나 지표면에 비치는 햇볕의 양.

일조시간이라고 부르는 것이 더욱 적절

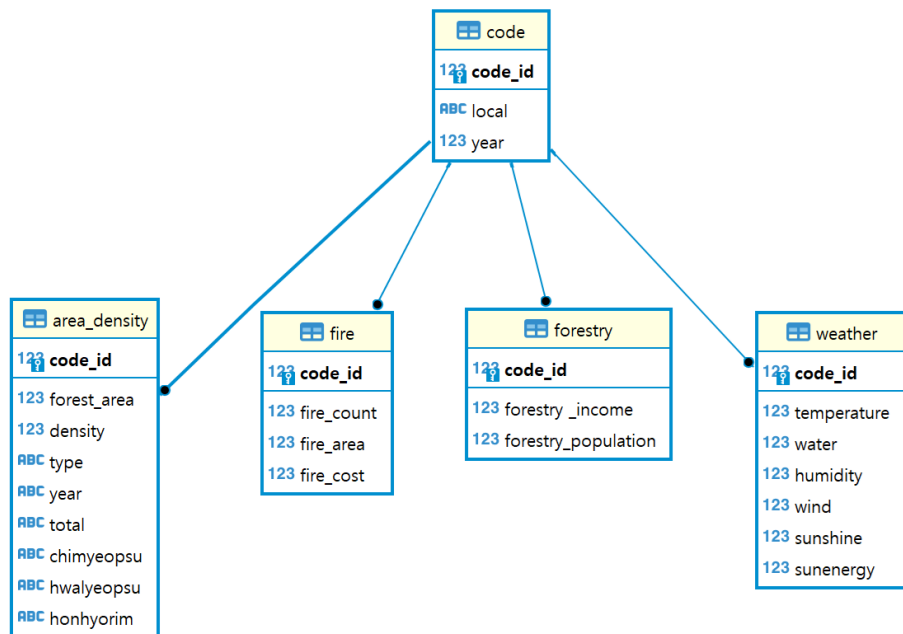**일사량** : 태양의 복사 에너지가 땅에 닿는 양

즉, 일조시간은 시간적인 감각의 의미가 크고,

일사량은 물리적인 에너지양이라는 의미가 크다.

이소정

```sql
/* 년도별 산불 발생현황 */
select c.year, sum(f.fire_count) count,
    sum(f.fire_area) area, sum(f.fire_cost) cost
from fire f join code c
    on f.code_id = c.code_id
group by c.year
order by 3 desc;
```


	year	count	area	cost
1	2,000	273	24,591.72	62,721,770
2	1,996	171	3,892.2	8,283,266
3	2,019	245	3,085.66	260,970,606
4	2,020	191	2,221.85	119,798,364
5	1,997	157	1,417	1,293,333
6	2,005	[NULL]	1,373.97	6,275,380
7	2,017	243	1,350.25	72,341,991
8	2,004	179	1,141.14	3,092,859
9	2,009	255	1,011.69	3,305,709
10	2,011	131	910.92	24,839,656
11	2,018	195	758.35	41,065,139
12	1,998	58	690.37	1,790,918
13	2,021	125	558.17	27,008,386
14	1,995	250	457.66	104,878
15	2,001	218	305.35	864,281
16	2,015	198	237.66	10,141,326
17	2,016	132	219.53	8,527,636
18	2,010	139	214.33	3,882,737
19	2,013	109	138.64	10,074,630
20	1,999	97	128.69	159,843
21	2,002	149	112.15	260,275
22	2,007	113	82.08	107,304
23	2,008	149	81.89	208,382
24	2,006	[NULL]	63.32	128,525
25	2,014	172	62.84	5,024,265
26	2,003	67	30.41	66,953
27	2,012	67	14.61	602,093

```sql
/* 산불이 발생했던 가장 많았던(작았던) 두 개 년도 */
select c.year, sum(f.fire_count) count, sum(f.fire_area) area,
       avg(w.wind) wind, avg(w.water) water, avg(w.humidity) humidity,
       avg(w.sunshine) sunshine, avg(w.sunenergy) sunenergy
from fire f
    inner join weather w
    on f.code_id = w.code_id
    inner join code c
    on c.code_id = f.code_id
group by c.year
having c.year in (2000, 1996, 2003, 2012)
order by 3 desc;
```

	123 year	123 count	123 area	123 wind	123 water	123 humidity	123 sunshine	123 sunenergy
1	2,000	273	24,591.72	2.025	1,226.5	62.25	2,097.575	4,660.005
2	1,996	171	3,892.2	1.95	1,079.775	67.5	2,198.4	4,529.53
3	2,003	67	30.41	1.9	1,929.775	67	1,878.625	4,515.6575
4	2,012	67	14.61	2.025	1,379.575	63.75	2,272.55	5,145.03

```sql
/* 지역별 산불 */
select c.local, avg(f.fire_count) count, avg(f.fire_area) area,
       avg(w.wind) wind, avg(w.water) water, avg(w.humidity) humidity,
       avg(w.sunshine) sunshine, avg(w.sunenergy) sunenergy
from fire f
    inner join weather w
    on f.code_id = w.code_id
    inner join code c
    on c.code_id = f.code_id
group by c.local
order by 2 desc;
```

local	count	area	wind	water	humidity	sunshine	sunenergy
1	gyeongsang	115.28	315.9888888889	1.9814814815	1,320.6092592593	64.7592592593	2,327.5481481481	5,007.2392592593
2	gangwon	48.04	1,356.3240740741	1.9222222222	1,369.7185185185	64.7592592593	2,157.0740740741	4,844.2672222222

김도형

/* 지역별 산불과 **산림** */

```sql
select c.local, avg(f.fire_count), avg(f.fire_area),
    avg(ad.forest_area), avg(ad.density)
from fire f join area_density ad
  on f.code_id = ad.code_id
  join code c
  on c.code_id = f.code_id
group by c.local;
```

/* 연도별 산불과 산림 */

```sql
select c.year, avg(f.fire_count), avg(f.fire_area),
    avg(ad.forest_area), avg(ad.density)
from fire f join area_density ad
  on f.code_id = ad.code_id
  join code c
  on c.code_id = f.code_id
group by c.year
order by 3 desc;
```

	local	avg(f.fire_count)	avg(f.fire_area)	avg(ad.forest_area)	avg(ad.density)
1	gyeongsang	119	361.7444444444	1,850,163.7778	169,605,324.5556
2	gangwon	47.5	1,752.3377777778	830,948.625	144,087,769.0556

	year	avg(f.fire_count)	avg(f.fire_area)	avg(ad.forest_area)	avg(ad.density)
1	2,000	136.5	12,295.86	1,212,563	120,865,763.5
2	1,996	85.5	1,946.1	1,254,723.5	95,386,166
3	2,020	95.5	1,110.925	1,699,572.5	301,741,681
4	1,997	78.5	708.5	1,217,806	100,915,553.5
5	2,005	[NULL]	686.985	[NULL]	143,836,790
6	2,004	89.5	570.57	[NULL]	138,904,060.5
7	2,009	127.5	505.845	[NULL]	200,881,209
8	1,998	29	345.185	1,216,328	108,696,866
9	1,995	125	228.83	1,257,912.5	90,805,206
10	2,001	109	152.675	[NULL]	124,921,332
11	2,015	99	118.83	1,705,643.5	266,103,134
12	2,010	69.5	107.165	1,740,978	229,485,338.5
13	1,999	48.5	64.345	1,214,493.5	116,975,880.5
14	2,002	74.5	56.075	[NULL]	129,823,390
15	2,007	56.5	41.04	[NULL]	180,214,589
16	2,008	74.5	40.945	[NULL]	190,260,036.5
17	2,006	[NULL]	31.66	[NULL]	149,180,145.5
18	2,003	33.5	15.205	[NULL]	134,240,701

김수진

code_id	forest_area	density
1	1,856,049	87,721,760
2	1,852,307	91,621,194
3	1,785,190	96,001,198
4	1,783,429	108,667,425
5	1,781,434	121,641,553
6	1,779,942	126,488,032
7	[NULL]	131,447,565
8	[NULL]	137,320,808
9	[NULL]	142,939,222
10	[NULL]	148,813,711
11	[NULL]	154,976,015
12	[NULL]	161,729,304
13	[NULL]	192,387,273
14	[NULL]	205,250,457
15	[NULL]	218,139,943
16	1,740,978	263,924,533
21	2,039,644	311,135,404
26	2,032,501	352,690,445
29	659,776	93,888,652
30	657,140	99,151,138
31	650,422	105,829,909
32	649,227	108,726,307
33	647,553	112,310,208
34	645,184	115,243,495
35	[NULL]	118,395,099
36	[NULL]	122,325,972
37	[NULL]	125,542,180
38	[NULL]	128,994,410
39	[NULL]	132,697,565
40	[NULL]	136,630,987
41	[NULL]	168,041,905
42	[NULL]	175,269,616
43	[NULL]	183,622,475
44	[NULL]	195,046,144
49	1,371,643	221,070,864
54	1,366,644	250,792,917

#	year	forest_area	density
1	1,995	1,856,049	87,721,760
2	1,996	1,852,307	91,621,194
3	1,997	1,785,190	96,001,198
4	1,998	1,783,429	108,667,425
5	1,999	1,781,434	121,641,553
6	2,000	1,779,942	126,488,032
7	2,001	[NULL]	131,447,565
8	2,002	[NULL]	137,320,808
9	2,003	[NULL]	142,939,222
10	2,004	[NULL]	148,813,711
11	2,005	[NULL]	154,976,015
12	2,006	[NULL]	161,729,304
13	2,007	[NULL]	192,387,273
14	2,008	[NULL]	205,250,457
15	2,009	[NULL]	218,139,943
16	2,010	1,740,978	263,924,533
17	2,015	2,039,644	311,135,404
18	2,020	2,032,501	352,690,445
19	1,995	659,776	93,888,652
20	1,996	657,140	99,151,138
21	1,997	650,422	105,829,909
22	1,998	649,227	108,726,307
23	1,999	647,553	112,310,208
24	2,000	645,184	115,243,495
25	2,001	[NULL]	118,395,099
26	2,002	[NULL]	122,325,972
27	2,003	[NULL]	125,542,180
28	2,004	[NULL]	128,994,410
29	2,005	[NULL]	132,697,565
30	2,006	[NULL]	136,630,987
31	2,007	[NULL]	168,041,905
32	2,008	[NULL]	175,269,616
33	2,009	[NULL]	183,622,475
34	2,010	[NULL]	195,046,144
35	2,015	1,371,643	221,070,864
36	2,020	1,366,644	250,792,917

```sql
select  c.year,ad.forest_area,ad.density
from area_density ad
    inner join code c
        on ad.code_id = c.code_id ;
```

area_density
- code_id
- forest_area
- density

code
- code_id
- local
- year

weather
- code_id
- temperature
- water
- humidity
- wind
- sunshine
- sunenergy
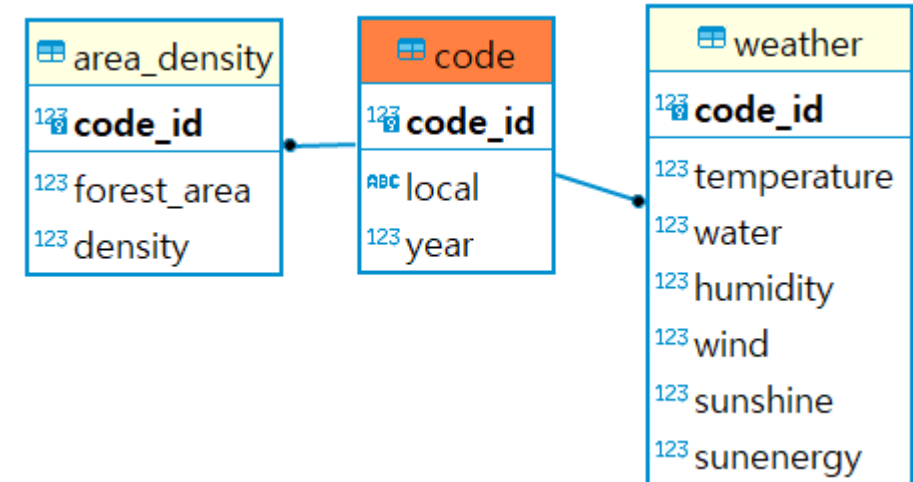
```sql
#1995-2000 면적    변화 - 경상
select  c.year,ad.forest_area
from area_density ad
    inner join code c
        on ad.code_id = c.code_id
where ad.code_id <=6
order by year ;
```

```sql
#95,00,05,15,20 확인
select  c.year,ad.forest_area
from area_density ad
    inner join code c
        on ad.code_id = c.code_id
where ad.code_id in (1,6,11,16,21,26)
order by year;
```

경상

	year	forest_area
1	1,995	1,856,049
2	1,996	1,852,307
3	1,997	1,785,190
4	1,998	1,783,429
5	1,999	1,781,434
6	2,000	1,779,942

강원

	year	forest_area
1	1,995	659,776
2	1,996	657,140
3	1,997	650,422
4	1,998	649,227
5	1,999	647,553
6	2,000	645,184

where ad.code_id between 29 and 34

경상

	year	forest_area
1	1,995	1,856,049
2	2,000	1,779,942
3	2,005	[NULL]
4	2,010	1,740,978
5	2,015	2,039,644
6	2,020	2,032,501

강원

	year	forest_area
1	1,995	659,776
2	2,000	645,184
3	2,005	[NULL]
4	2,010	[NULL]
5	2,015	1,371,643
6	2,020	1,366,644

where ad.code_id in (29,34,39,44,49,54)

#축적확인

```sql
select  c.year,ad.density
from area_density ad
   inner join code c
      on ad.code_id = c.code_id
where ad.code_id <=16
order by year ;


where ad.code_id in (29,34,39,44,49,54)
```

	year	density
1	1,995	87,721,760
2	1,996	91,621,194
3	1,997	96,001,198
4	1,998	108,667,425
5	1,999	121,641,553
6	2,000	126,488,032
7	2,001	131,447,565
8	2,002	137,320,808
9	2,003	142,939,222
10	2,004	148,813,711
11	2,005	154,976,015
12	2,006	161,729,304
13	2,007	192,387,273
14	2,008	205,250,457
15	2,009	218,139,943
16	2,010	263,924,533

	year	density
1	1,995	93,888,652
2	1,996	99,151,138
3	1,997	105,829,909
4	1,998	108,726,307
5	1,999	112,310,208
6	2,000	115,243,495
7	2,001	118,395,099
8	2,002	122,325,972
9	2,003	125,542,180
10	2,004	128,994,410
11	2,005	132,697,565
12	2,006	136,630,987
13	2,007	168,041,905
14	2,008	175,269,616
15	2,009	183,622,475
16	2,010	195,046,144

```sql
select  c.year, ad.density , floor(w.temperature) as temperature
from area_density ad
    inner join code c
        on ad.code_id = c.code_id
    inner join weather w
        on w.code_id =ad.code_id
where ad.code_id between 29 and 44
order by w.temperature ;
```

year	density	temperature
1,996	99,151,138	11
1,995	93,888,652	11
2,003	125,542,180	11
2,005	132,697,565	11
2,001	118,395,099	11
2,002	122,325,972	11
1,997	105,829,909	11
2,000	115,243,495	11
2,010	195,046,144	11
2,006	136,630,987	11
2,009	183,622,475	12
1,999	112,310,208	12
2,008	175,269,616	12
2,007	168,041,905	12
2,004	128,994,410	12
1,998	108,726,307	12

year	density	water
2,001	118,395,099	1,055
1,996	99,151,138	1,160
2,000	115,243,495	1,197
1,995	93,888,652	1,253
2,008	175,269,616	1,280
2,010	195,046,144	1,309
1,997	105,829,909	1,327
2,007	168,041,905	1,359
2,009	183,622,475	1,369
2,005	132,697,565	1,484
2,004	128,994,410	1,514
2,002	122,325,972	1,562
1,999	112,310,208	1,682
1,998	108,726,307	1,699
2,006	136,630,987	1,753
2,003	125,542,180	1,910

year	density	sunshine
2,003	125,542,180	1,782
2,007	168,041,905	1,827
2,006	136,630,987	1,842
2,010	195,046,144	1,892
1,998	108,726,307	1,947
2,000	115,243,495	2,016
2,002	122,325,972	2,017
2,001	118,395,099	2,058
2,009	183,622,475	2,059
1,996	99,151,138	2,060
2,008	175,269,616	2,078
1,995	93,888,652	2,154
2,005	132,697,565	2,170
2,004	128,994,410	2,180
1,997	105,829,909	2,219
1,999	112,310,208	2,220

김동우

기후변화에 따른 한반도 임업경제의 변화

임업경제의 추세

쿼리문

```sql
# 기후가 변화하면서 산림도 줄어들고 임업 종사자 수도 줄어들 것인가?
SELECT YEAR,local,forestry_income, density
FROM forestry AS f
    INNER JOIN area_density AS ad
    ON f.code_id = ad.code_id
    INNER JOIN code AS c
    ON c.code_id = f.code_id;
```

```
YEAR|local     |forestry_income|density    |
-----+----------+---------------+-----------+
2005|gyeongsang|        8152.0|154976015|
2006|gyeongsang|       10805.0|161729304|
2007|gyeongsang|        7740.0|192387273|
2008|gyeongsang|        6123.0|205250457|
2009|gyeongsang|        7018.0|218139943|
2010|gyeongsang|        8180.0|263924533|
2015|gyeongsang|        6773.0|311135404|
2005|gangwon   |        2790.0|132697565|
2006|gangwon   |        3028.0|136630987|
2007|gangwon   |       10757.0|168041905|
2008|gangwon   |        4302.0|175269616|
2009|gangwon   |        5670.0|183622475|
2010|gangwon   |       12849.0|195046144|
2015|gangwon   |       19677.0|221070864|
```

산림의 밀도도 증가하고, 소득도 증가하고 있다.
(심지어 물가상승률을 상회하는 증가)

결론

기후변화는 없다.
한반도 산림은 멀쩡하다.
언론과 학계의 위기감 조성이 있다.

산림은 '?다됐조'[::-1]   산림은 '!다됐조안'[::-1]!
임업은 '?다됐조'[::-1]   임업은 '!다됐조안'[::-1]!

THANK YOU