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Batch-1
Day-4
22/1/2023
Data engineering

1.EXCEPT

In sql we have EXCEPT but in mysql we don't have but we can use it this way

```
mysql> SELECT *
-> FROM animals a
-> WHERE EXISTS (
->   SELECT 1
->   FROM shelters s
->   WHERE s.id = a.shelter
->   AND s.location = 'Red City'
-> );
```

animal_id	name	breed	color	gender	status	species	shelter
1	Bellyflop	Beagle	Brown	Male	0	Dog	1
2	Snowy	Husky	Brown	Female	1	Dog	1
3	Princess	Pomeranian	Brown	Female	0	Dog	1
4	Cricket	Chihuahua	Brown	Male	0	Dog	1
5	Princess	Poodle	Brown	Female	0	Dog	1
6	Spot	Dalmation	Black and White	Male	0	Dog	1
7	Meowmix	Munchkin	Yellow	Female	0	Cat	1
8	Ash	Persian	Gray	Female	0	Cat	1
9	Tiger	Bengal	Brown	Male	0	Cat	1

9 rows in set (0.02 sec)

2.MERGE

We don't have merge in mysql but we can do it this way

```
mysql> REPLACE INTO animals (animal_id, name, breed, color, gender, status, species, shelter)
-> VALUES (11, 'Rush', 'Bengal', 'White', 'Male', 0, 'Dog', 3);
Query OK, 1 row affected (0.05 sec)
```

```
mysql> select * from animals;
```

animal_id	name	breed	color	gender	status	species	shelter
1	Bellyflop	Beagle	Brown	Male	0	Dog	1
2	Snowy	Husky	Brown	Female	1	Dog	1
3	Princess	Pomeranian	Brown	Female	0	Dog	1
4	Cricket	Chihuahua	Brown	Male	0	Dog	1
5	Princess	Poodle	Brown	Female	0	Dog	1
6	Spot	Dalmation	Black and White	Male	0	Dog	1
7	Meowmix	Munchkin	Yellow	Female	0	Cat	1
8	Ash	Persian	Gray	Female	0	Cat	1
9	Tiger	Bengal	Brown	Male	0	Cat	1
10	Snoops	Beagle	Brown	Male	0	Dog	2
11	Salt	Turkish Angora	White	Female	0	Cat	2
11	Rush	Bengal	White	Male	0	Dog	3

```
12 rows in set (0.01 sec)
```

```
mysql> |
```

3.correlated subquery

```
mysql> SELECT
-> animal_id,
-> name,
-> breed,
-> color,
-> gender,
-> status,
-> species,
-> shelter
-> FROM
-> animals a
-> WHERE
-> EXISTS (
-> SELECT 1
-> FROM shelters s
-> WHERE s.id = a.shelter
-> AND s.location = 'Red City'
-> );
```

animal_id	name	breed	color	gender	status	species	shelter
1	Bellyflop	Beagle	Brown	Male	0	Dog	1
2	Snowy	Husky	Brown	Female	1	Dog	1
3	Princess	Pomeranian	Brown	Female	0	Dog	1
4	Cricket	Chihuahua	Brown	Male	0	Dog	1
5	Princess	Poodle	Brown	Female	0	Dog	1
6	Spot	Dalmation	Black and White	Male	0	Dog	1
7	Meowmix	Munchkin	Yellow	Female	0	Cat	1
8	Ash	Persian	Gray	Female	0	Cat	1
9	Tiger	Bengal	Brown	Male	0	Cat	1

```
9 rows in set (0.00 sec)
```

4. Nested Subqueries

```
mysql> SELECT * FROM animals a WHERE a.shelter IN (
->     SELECT s.id
->     FROM shelters s
->     WHERE s.location = (
->         SELECT location
->         FROM shelters
->         WHERE name = 'Adopt A Buddy'
->     )
-> );
```

animal_id	name	breed	color	gender	status	species	shelter
10	Snoops	Beagle	Brown	Male	0	Dog	2
11	Salt	Turkish Angora	White	Female	0	Cat	2

2 rows in set (0.01 sec)

5.EXISTS

```
mysql> SELECT
-> *
-> FROM
-> animals a
-> WHERE
-> EXISTS (
->     SELECT 1
->     FROM animals b
->     WHERE b.species = a.species
->           AND b.animal_id != a.animal_id
->           AND b.shelter = a.shelter
-> );
```

animal_id	name	breed	color	gender	status	species	shelter
1	Bellyflop	Beagle	Brown	Male	0	Dog	1
2	Snowy	Husky	Brown	Female	1	Dog	1
3	Princess	Pomeranian	Brown	Female	0	Dog	1
4	Cricket	Chihuahua	Brown	Male	0	Dog	1
5	Princess	Poodle	Brown	Female	0	Dog	1
6	Spot	Dalmation	Black and White	Male	0	Dog	1
7	Meowmix	Munchkin	Yellow	Female	0	Cat	1
8	Ash	Persian	Gray	Female	0	Cat	1
9	Tiger	Bengal	Brown	Male	0	Cat	1

9 rows in set (0.00 sec)

6.ALL

```
mysql> SELECT
-> *
-> FROM
-> animals a
-> WHERE
-> status = 0
-> AND species = ALL (
-> SELECT species
-> FROM animals b
-> WHERE b.shelter = a.shelter
-> );
```

animal_id	name	breed	color	gender	status	species	shelter
11	Rush	Bengal	White	Male	0	Dog	3

1 row in set (0.00 sec)

7.ANY

```
mysql> SELECT
-> *
-> FROM
-> animals a
-> WHERE
-> breed = ANY (
-> SELECT breed
-> FROM animals b
-> WHERE b.shelter = a.shelter
-> );
```

animal_id	name	breed	color	gender	status	species	shelter
1	Bellyflop	Beagle	Brown	Male	0	Dog	1
2	Snowy	Husky	Brown	Female	1	Dog	1
3	Princess	Pomeranian	Brown	Female	0	Dog	1
4	Cricket	Chihuahua	Brown	Male	0	Dog	1
5	Princess	Poodle	Brown	Female	0	Dog	1
6	Spot	Dalmation	Black and White	Male	0	Dog	1
7	Meowmix	Munchkin	Yellow	Female	0	Cat	1
8	Ash	Persian	Gray	Female	0	Cat	1
9	Tiger	Bengal	Brown	Male	0	Cat	1
10	Snoops	Beagle	Brown	Male	0	Dog	2
11	Salt	Turkish Angora	White	Female	0	Cat	2
11	Rush	Bengal	White	Male	0	Dog	3

12 rows in set (0.00 sec)

8.Subqueries

```
mysql> SELECT
-> *
-> FROM
-> animals
-> WHERE
-> shelter IN (
->     SELECT id
->     FROM shelters
->     WHERE location = 'Red City'
-> );
```

animal_id	name	breed	color	gender	status	species	shelter
1	Bellyflop	Beagle	Brown	Male	0	Dog	1
2	Snowy	Husky	Brown	Female	1	Dog	1
3	Princess	Pomeranian	Brown	Female	0	Dog	1
4	Cricket	Chihuahua	Brown	Male	0	Dog	1
5	Princess	Poodle	Brown	Female	0	Dog	1
6	Spot	Dalmation	Black and White	Male	0	Dog	1
7	Meowmix	Munchkin	Yellow	Female	0	Cat	1
8	Ash	Persian	Gray	Female	0	Cat	1
9	Tiger	Bengal	Brown	Male	0	Cat	1

9 rows in set (0.00 sec)

9. Joins with groupby, having by, grouping sets

```
mysql> SELECT
-> a.shelter,
-> a.species,
-> COUNT(*) AS total_animals,
-> AVG(a.status) AS avg_status
-> FROM
-> animals a
-> JOIN
-> shelters s ON a.shelter = s.id
-> GROUP BY
-> a.shelter, a.species
-> HAVING
-> COUNT(*) > 1 OR AVG(a.status) > 0;
```

shelter	species	total_animals	avg_status
1	Dog	6	0.1667
1	Cat	3	0.0000

2 rows in set (0.01 sec)

10. Joins with groupby, aggregate functions

```
mysql> SELECT
->     s.id AS shelter_id,
->     s.name AS shelter_name,
->     COUNT(*) AS total_animals,
->     AVG(a.status) AS avg_status,
->     a.species
-> FROM
->     shelters s
-> JOIN
->     animals a ON s.id = a.shelter
-> GROUP BY
->     s.id, s.name, a.species;
```

shelter_id	shelter_name	total_animals	avg_status	species
1	Animals 4 Homes	6	0.1667	Dog
1	Animals 4 Homes	3	0.0000	Cat
2	Adopt A Buddy	1	0.0000	Dog
2	Adopt A Buddy	1	0.0000	Cat
3	Fluffy Animals	1	0.0000	Dog

5 rows in set (0.00 sec)

11.CROSS JOIN

```
mysql> SELECT
->     a.animal_id,
->     a.name AS animal_name,
->     a.breed,
->     a.color,
->     a.gender,
->     a.status,
->     a.species,
->     s.id AS shelter_id,
->     s.name AS shelter_name
-> FROM
->     animals a
-> CROSS JOIN
->     shelters s;
```

animal_id	animal_name	breed	color	gender	status	species	shelter_id	shelter_name
1	Bellyflop	Beagle	Brown	Male	0	Dog	3	Fluffy Animals
1	Bellyflop	Beagle	Brown	Male	0	Dog	2	Adopt A Buddy
1	Bellyflop	Beagle	Brown	Male	0	Dog	1	Animals 4 Homes
2	Snowy	Husky	Brown	Female	1	Dog	3	Fluffy Animals
2	Snowy	Husky	Brown	Female	1	Dog	2	Adopt A Buddy
2	Snowy	Husky	Brown	Female	1	Dog	1	Animals 4 Homes
3	Princess	Pomeranian	Brown	Female	0	Dog	3	Fluffy Animals
3	Princess	Pomeranian	Brown	Female	0	Dog	2	Adopt A Buddy
3	Princess	Pomeranian	Brown	Female	0	Dog	1	Animals 4 Homes
4	Cricket	Chihuahua	Brown	Male	0	Dog	3	Fluffy Animals
4	Cricket	Chihuahua	Brown	Male	0	Dog	2	Adopt A Buddy
4	Cricket	Chihuahua	Brown	Male	0	Dog	1	Animals 4 Homes

12.BETWEEN

```
mysql> SELECT
-> *
-> FROM
-> animals
-> WHERE
-> animal_id BETWEEN 1 AND 3;
```

animal_id	name	breed	color	gender	status	species	shelter
1	Bellyflop	Beagle	Brown	Male	0	Dog	1
2	Snowy	Husky	Brown	Female	1	Dog	1
3	Princess	Pomeranian	Brown	Female	0	Dog	1

3 rows in set (0.00 sec)

13.Using Functions to Customize the Result Set

```
mysql> SELECT
-> animal_id,
-> name,
-> breed,
-> UPPER(color) AS uppercase_color,
-> gender,
-> status,
-> species,
-> shelter
-> FROM
-> animals;
```

animal_id	name	breed	uppercase_color	gender	status	species	shelter
1	Bellyflop	Beagle	BROWN	Male	0	Dog	1
2	Snowy	Husky	BROWN	Female	1	Dog	1
3	Princess	Pomeranian	BROWN	Female	0	Dog	1
4	Cricket	Chihuahua	BROWN	Male	0	Dog	1
5	Princess	Poodle	BROWN	Female	0	Dog	1
6	Spot	Dalmation	BLACK AND WHITE	Male	0	Dog	1
7	Meowmix	Munchkin	YELLOW	Female	0	Cat	1
8	Ash	Persian	GRAY	Female	0	Cat	1
9	Tiger	Bengal	BROWN	Male	0	Cat	1
10	Snoops	Beagle	BROWN	Male	0	Dog	2
11	Salt	Turkish Angora	WHITE	Female	0	Cat	2
11	Rush	Bengal	WHITE	Male	0	Dog	3

12 rows in set (0.00 sec)

14.Using String Functions

ERROR 1052 (23000): Column 'name' in field list is ambiguous

```
mysql> SELECT
->   CONCAT(a.name, ' the ', a.species) AS animal_description,
->   a.breed,
->   a.color,
->   a.gender,
->   a.status,
->   a.shelter,
->   UPPER(s.location) AS uppercase_location
-> FROM
->   animals a
-> JOIN
->   shelters s ON a.shelter = s.id;
```

animal_description	breed	color	gender	status	shelter	uppercase_location
Bellyflop the Dog	Beagle	Brown	Male	0	1	RED CITY
Snowy the Dog	Husky	Brown	Female	1	1	RED CITY
Princess the Dog	Pomeranian	Brown	Female	0	1	RED CITY
Cricket the Dog	Chihuahua	Brown	Male	0	1	RED CITY
Princess the Dog	Poodle	Brown	Female	0	1	RED CITY
Spot the Dog	Dalmation	Black and White	Male	0	1	RED CITY
Meowmix the Cat	Munchkin	Yellow	Female	0	1	RED CITY
Ash the Cat	Persian	Gray	Female	0	1	RED CITY
Tiger the Cat	Bengal	Brown	Male	0	1	RED CITY
Snoops the Dog	Beagle	Brown	Male	0	2	GREEN TOWN
Salt the Cat	Turkish Angora	White	Female	0	2	GREEN TOWN
Rush the Dog	Bengal	White	Male	0	3	BLUE HILLS

12 rows in set (0.00 sec)

15.Using String Functions

ERROR 1052 (23000): Column 'name' in field list is ambiguous

```
mysql> SELECT
->   CONCAT(a.name, ' the ', a.species) AS animal_description,
->   a.breed,
->   a.color,
->   a.gender,
->   a.status,
->   a.shelter,
->   UPPER(s.location) AS uppercase_location
-> FROM
->   animals a
-> JOIN
->   shelters s ON a.shelter = s.id;
```

animal_description	breed	color	gender	status	shelter	uppercase_location
Bellyflop the Dog	Beagle	Brown	Male	0	1	RED CITY
Snowy the Dog	Husky	Brown	Female	1	1	RED CITY
Princess the Dog	Pomeranian	Brown	Female	0	1	RED CITY
Cricket the Dog	Chihuahua	Brown	Male	0	1	RED CITY
Princess the Dog	Poodle	Brown	Female	0	1	RED CITY
Spot the Dog	Dalmation	Black and White	Male	0	1	RED CITY
Meowmix the Cat	Munchkin	Yellow	Female	0	1	RED CITY
Ash the Cat	Persian	Gray	Female	0	1	RED CITY
Tiger the Cat	Bengal	Brown	Male	0	1	RED CITY
Snoops the Dog	Beagle	Brown	Male	0	2	GREEN TOWN
Salt the Cat	Turkish Angora	White	Female	0	2	GREEN TOWN
Rush the Dog	Bengal	White	Male	0	3	BLUE HILLS

12 rows in set (0.00 sec)

16.Using Date Functions


```
mysql> SELECT
->   a.animal_id,
->   a.name,
->   a.breed,
->   a.color,
->   a.gender,
->   a.status,
->   a.species,
->   a.shelter,
->   s.id AS shelter_id,
->   s.name AS shelter_name,
->   NOW() AS operating_days
-> FROM
->   animals a
-> JOIN
->   shelters s ON a.shelter = s.id;
```

animal_id	name	breed	color	gender	status	species	shelter	shelter_id	shelter_name	operating_days
1	Bellyflop	Beagle	Brown	Male	0	Dog	1	1	Animals 4 Homes	2024-01-22 20:06:59
2	Snowy	Husky	Brown	Female	1	Dog	1	1	Animals 4 Homes	2024-01-22 20:06:59
3	Princess	Pomeranian	Brown	Female	0	Dog	1	1	Animals 4 Homes	2024-01-22 20:06:59
4	Cricket	Chihuahua	Brown	Male	0	Dog	1	1	Animals 4 Homes	2024-01-22 20:06:59
5	Princess	Poodle	Brown	Female	0	Dog	1	1	Animals 4 Homes	2024-01-22 20:06:59
6	Spot	Dalmation	Black and White	Male	0	Dog	1	1	Animals 4 Homes	2024-01-22 20:06:59
7	Meowmix	Munchkin	Yellow	Female	0	Cat	1	1	Animals 4 Homes	2024-01-22 20:06:59
8	Ash	Persian	Gray	Female	0	Cat	1	1	Animals 4 Homes	2024-01-22 20:06:59
9	Tiger	Bengal	Brown	Male	0	Cat	1	1	Animals 4 Homes	2024-01-22 20:06:59
10	Snoops	Beagle	Brown	Male	0	Dog	2	2	Adopt A Buddy	2024-01-22 20:06:59
11	Salt	Turkish Angora	White	Female	0	Cat	2	2	Adopt A Buddy	2024-01-22 20:06:59
11	Rush	Bengal	White	Male	0	Dog	3	3	Fluffy Animals	2024-01-22 20:06:59

12 rows in set (0.01 sec)

17.Using Mathematical Functions

```
mysql> SELECT
->   a.shelter,
->   COUNT(*) AS total_pets_in_shelter
-> FROM
->   animals a
-> GROUP BY
->   a.shelter;
```

shelter	total_pets_in_shelter
1	9
2	2
3	1

3 rows in set (0.00 sec)

18.Using System Functions

```
mysql> SELECT
-> a.animal_id,
-> a.name,
-> a.breed,
-> a.color,
-> a.gender,
-> a.status,
-> a.species,
-> a.shelter,
->
-> NOW() AS current_datetime
-> FROM
-> animals a;
```

animal_id	name	breed	color	gender	status	species	shelter	current_datetime
1	Bellyflop	Beagle	Brown	Male	0	Dog	1	2024-01-22 20:17:28
2	Snowy	Husky	Brown	Female	1	Dog	1	2024-01-22 20:17:28
3	Princess	Pomeranian	Brown	Female	0	Dog	1	2024-01-22 20:17:28
4	Cricket	Chihuahua	Brown	Male	0	Dog	1	2024-01-22 20:17:28
5	Princess	Poodle	Brown	Female	0	Dog	1	2024-01-22 20:17:28
6	Spot	Dalmation	Black and White	Male	0	Dog	1	2024-01-22 20:17:28
7	Meowmix	Munchkin	Yellow	Female	0	Cat	1	2024-01-22 20:17:28
8	Ash	Persian	Gray	Female	0	Cat	1	2024-01-22 20:17:28
9	Tiger	Bengal	Brown	Male	0	Cat	1	2024-01-22 20:17:28
10	Snoops	Beagle	Brown	Male	0	Dog	2	2024-01-22 20:17:28
11	Salt	Turkish Angora	White	Female	0	Cat	2	2024-01-22 20:17:28
11	Rush	Bengal	White	Male	0	Dog	3	2024-01-22 20:17:28

12 rows in set (0.00 sec)

19. Date Functions

select day ('2023-05-30');
return value of date of that particular day

select month ('2023-05-31');
return month value

select year ('2023-05-3');
return year value

20.Mathematical Functions

select abs(-101);
returns absolute value

select sin(1.5);
returns angle in radians

select ceiling(14.01);
returns the smallest or greater to the specified value

select exp(4.5);

returns the exponencial value

select floor(14.75);

select log(5.4);

return logarithmic value