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Aggregations. – ECBS 5146 SQL and Different Shapes of Data

4–5 minutes

Overview

Teaching: 90 min

Questions

- As analyst, one the most important operation you do, is data aggregation. How SQL supports data aggregation?

Objectives

- Learn about conditional logic
- Introduce the aggregation concepts in SQL
- Introduce the most used aggregation functions
- Introduce the functions related to grouping
- Present examples and exercise aggregation and grouping

Keywords

#CONDITIONAL LOGIC

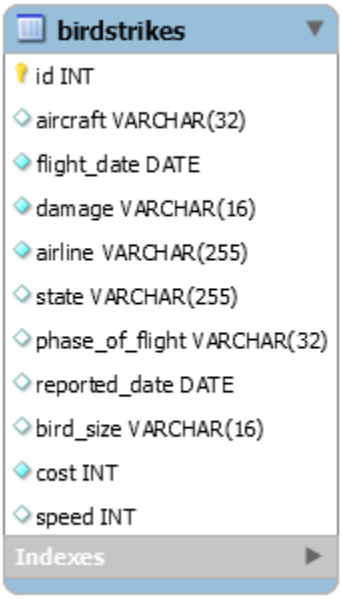
#AGGREGATING

#GROUPING

Table of Content

Chapter's database

No need to load new data, in this chapter we will use only the birdstrikes table loaded in the last chapter:



Conditional logic

CASE

Syntax form

```
CASE expression
```

```
    WHEN test THEN result
    …
    ELSE otherResult
END
```

Lets create a new field based on cost

```
SELECT aircraft, airline, cost,
    CASE
        WHEN cost  = 0
            THEN 'NO COST'
        WHEN  cost >0 AND cost < 100000
            THEN 'MEDIUM COST'
        ELSE
            'HIGH COST'
    END
    AS cost_category
FROM  birdstrikes
ORDER BY cost_category;
```

Exercise1

Do the same with speed. If speed is NULL or speed < 100 create a “LOW SPEED” category, otherwise, mark as “HIGH SPEED”. Use IF instead of CASE!

Aggregations

COUNT

Counting the number of records

`COUNT(*)` - counts the number of records

```
SELECT COUNT(*) FROM birdstrikes;
```

`COUNT(column)` - counts the number of not NULL records for the given column

```
SELECT COUNT(reported_date) FROM birdstrikes;
```

DISTINCT

How do we list all distinct states? (Remember last seminar!)

```
SELECT DISTINCT state FROM birdstrikes;
```

Count number of distinct states

```
SELECT COUNT(DISTINCT state) FROM birdstrikes;
```

Exercise2

How many distinct 'aircraft' we have in the database?

MAX, AVG, SUM

The sum of all repair costs of birdstrikes accidents

```
SELECT SUM(cost) FROM birdstrikes;
```

Speed in this database is measured in KNOTS. Let's transform to KMH. 1 KNOT = 1.852 KMH

```
SELECT (AVG(speed)*1.852) as avg_kmh FROM
birdstrikes;
```

How many observation days we have in birdstrikes

```
SELECT
DATEDIFF(MAX(reported_date),MIN(reported_date)) from
```

```
birdstrikes;
```

Exercise3

What was the lowest speed of aircrafts starting with ‘H’

Grouping

GROUP BY

What is the highest speed by aircraft type?

```
SELECT MIN(speed), aircraft FROM birdstrikes GROUP BY
aircraft;
```

Which state for which aircraft type paid the most repair cost?

```
SELECT state, aircraft, SUM(cost) AS sum FROM
birdstrikes WHERE state !='' GROUP BY state, aircraft
ORDER BY sum DESC;
```

Exercise4

Which phase_of_flight has the least of incidents?

Exercise5

What is the rounded highest average cost by phase_of_flight?

HAVING

We would like to filter the result of the aggregation. In this case we want only the results where the avg speed is equal to 50.

```
SELECT AVG(speed) AS avg_speed,state FROM birdstrikes
```

```
GROUP BY state WHERE ROUND(avg_speed) = 50;
```

Crashbummbang! The correct keyword after GROUP BY is HAVING

```
SELECT AVG(speed) AS avg_speed,state FROM birdstrikes
GROUP BY state HAVING ROUND(avg_speed) = 50;
```

Exercise6

What the highest AVG speed of the states with names less than 5 characters?

Homework 3

- Upload the solution of exercise 1-6 to your GitHub repo in a folder called HW3
- Make sure to submit both the SQL statements and answers to the questions
- The required data format for submission is a .sql file
- Submit GitHub repo link to moodle when you are ready