

# Projekt analityczny: linie lotnicze

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```
library(odbc)

## Warning: package 'odbc' was built under R version 4.0.5

library(DBI)
con <- DBI::dbConnect(odbc::odbc(),
  Driver = "SQL Server",
  Server = "mssql-2017.labs.wmi.amu.edu.pl",
  Database = "dbad_flights",
  Trusted_Connection = "True")
```

## Pytania i odpowiedzi

a. Jakie było średnie opóźnienie przylotu?

```
SELECT AVG(arr_delay_new) [avg_delay]
FROM Flight_delays
```

Table 1: 1 records

| avg_delay |
|-----------|
| 15.91152  |

b. Jakie było maksymalne opóźnienie przylotu?

```
SELECT MAX(arr_delay_new) AS max_delay FROM Flight_delays
```

Table 2: 1 records

| max_delay |
|-----------|
| 1895      |

c. Który lot miał największe opóźnienie przylotu?

```
SELECT fl_date, arr_delay_new, carrier, origin_city_name, dest_city_name
FROM Flight_delays
WHERE arr_delay_new = (SELECT MAX(arr_delay_new) FROM Flight_delays)
```

Table 3: 1 records

| fl_date    | arr_delay_new | carrier | origin_city_name | dest_city_name  |
|------------|---------------|---------|------------------|-----------------|
| 2017-07-26 | 1895          | AA      | Kona, HI         | Los Angeles, CA |

d.Które dni tygodnia są najgorsze do podróżowania?

```
SELECT AVG(arr_delay_new) AS avg_delay , w.weekday_name
FROM Flight_delays f JOIN Weekdays w ON f.day_of_week = w.weekday_id
GROUP BY w.weekday_name
ORDER BY AVG(arr_delay_new) DESC
```

Table 4: 7 records

| avg_delay | weekday_name |
|-----------|--------------|
| 20.80747  | Friday       |
| 18.04801  | Monday       |
| 16.10514  | Wednesday    |
| 15.64696  | Thursday     |
| 15.21876  | Saturday     |
| 12.88056  | Tuesday      |
| 12.77606  | Sunday       |

e.Które linie lotnicze latające z San Francisco (SFO) mają najmniejsze opóźnienia przylotu?

```
SELECT AVG(arr_delay_new) AS avg_delay, airline_name
FROM Flight_delays f JOIN Airlines a ON f.airline_id = a.airline_id
WHERE airline_name IN
(SELECT a.airline_name
FROM Flight_delays f JOIN Airlines a ON f.airline_id = a.airline_id
WHERE f.origin = 'SFO')
GROUP BY airline_name
ORDER BY AVG(arr_delay_new) DESC
```

Table 5: Displaying records 1 - 10

| avg_delay | airline_name               |
|-----------|----------------------------|
| 28.841148 | JetBlue Airways: B6        |
| 18.980300 | Frontier Airlines Inc.: F9 |
| 18.375314 | American Airlines Inc.: AA |
| 16.950403 | United Air Lines Inc.: UA  |
| 16.808273 | SkyWest Airlines Inc.: OO  |
| 13.964467 | Virgin America: VX         |
| 13.823983 | Southwest Airlines Co.: WN |
| 12.258788 | Delta Air Lines Inc.: DL   |
| 7.453927  | Alaska Airlines Inc.: AS   |
| 4.202719  | Hawaiian Airlines Inc.: HA |

f.Jaka część linii lotniczych ma regularne opóźnienia, tj. jej lot ma średnio co najmniej 10 min. opóźnienia?

```
SELECT (SELECT SUM(ile)
FROM (SELECT COUNT(DISTINCT a.airline_name) AS ile
FROM Flight_delays f JOIN Airlines a ON f.airline_id = a.airline_id
GROUP BY a.airline_name
HAVING AVG(arr_delay_new) > 10) AS razem) * 1.0 /
(SELECT COUNT(DISTINCT airline_id) FROM Flight_delays) AS late_proportion
```

Table 6: 1 records

| late_proportion |
|-----------------|
| 0.8333333       |

i. Które linie lotnicze latają zarówno na trasie SFO → PDX (Portland), jak i SFO → EUG (Eugene)?

```
SELECT DISTINCT a.airline_name
FROM Flight_delays f JOIN Airlines a ON f.airline_id = a.airline_id
WHERE a.airline_id IN
(SELECT DISTINCT airline_id FROM Flight_delays
WHERE origin = 'SFO' AND dest = 'PDX' AND airline_id IN
(SELECT DISTINCT airline_id FROM Flight_delays
WHERE origin = 'SFO' AND dest = 'EUG'))
```

Table 7: 2 records

| airline_name              |
|---------------------------|
| SkyWest Airlines Inc.: OO |
| United Air Lines Inc.: UA |

j. Jak najszybciej dostać się z Chicago do Stanfordu, zakładając wylot po 14:00 czasu lokalnego?

```
SELECT AVG(arr_delay_new) AS 'avg_delay', origin, dest
FROM Flight_delays
WHERE (origin = 'MDW' OR origin = 'ORD') AND (dest IN ('SFO', 'SJC', 'OAK'))
AND crs_dep_time > 1400
GROUP BY origin, dest
ORDER BY AVG(arr_delay_new) DESC
```

Table 8: 5 records

| avg_delay | origin | dest |
|-----------|--------|------|
| 22.19253  | ORD    | SFO  |
| 19.85714  | MDW    | SFO  |
| 17.20000  | MDW    | SJC  |
| 14.81111  | ORD    | SJC  |
| 12.12903  | MDW    | OAK  |