**Solution :**

Output :

Connection to the database was successful.

List of tables present in the database:

aircrafts\_data

airports\_data

boarding\_passes

bookings

flights

seats

ticket\_flights

tickets

aircrafts\_data

aircraft\_code model range

0 773 {"en": "Boeing 777-300", "ru": "Боинг 777-300"} 11100

1 763 {"en": "Boeing 767-300", "ru": "Боинг 767-300"} 7900

2 SU9 {"en": "Sukhoi Superjet-100", "ru": "Сухой Суп... 3000

3 320 {"en": "Airbus A320-200", "ru": "Аэробус A320-... 5700

4 321 {"en": "Airbus A321-200", "ru": "Аэробус A321-... 5600

5 319 {"en": "Airbus A319-100", "ru": "Аэробус A319-... 6700

6 733 {"en": "Boeing 737-300", "ru": "Боинг 737-300"} 4200

7 CN1 {"en": "Cessna 208 Caravan", "ru": "Сессна 208... 1200

8 CR2 {"en": "Bombardier CRJ-200", "ru": "Бомбардье ... 2700

...............................................................................................

airports\_data

airport\_code ... timezone

0 YKS ... Asia/Yakutsk

1 MJZ ... Asia/Yakutsk

2 KHV ... Asia/Vladivostok

3 PKC ... Asia/Kamchatka

4 UUS ... Asia/Sakhalin

.. ... ... ...

99 MMK ... Europe/Moscow

100 ABA ... Asia/Krasnoyarsk

101 BAX ... Asia/Krasnoyarsk

102 AAQ ... Europe/Moscow

103 CNN ... Asia/Yakutsk

[104 rows x 5 columns]

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boarding\_passes

ticket\_no flight\_id boarding\_no seat\_no

0 0005435212351 30625 1 2D

1 0005435212386 30625 2 3G

2 0005435212381 30625 3 4H

3 0005432211370 30625 4 5D

4 0005435212357 30625 5 11A

... ... ... ... ...

579681 0005434302871 19945 85 20F

579682 0005432892791 19945 86 21C

579683 0005434302869 19945 87 20E

579684 0005432802476 19945 88 21F

579685 0005432802482 19945 89 21E

[579686 rows x 4 columns]

...............................................................................................

bookings

book\_ref book\_date total\_amount

0 00000F 2017-07-05 03:12:00+03 265700

1 000012 2017-07-14 09:02:00+03 37900

2 000068 2017-08-15 14:27:00+03 18100

3 000181 2017-08-10 13:28:00+03 131800

4 0002D8 2017-08-07 21:40:00+03 23600

... ... ... ...

262783 FFFEF3 2017-07-17 07:23:00+03 56000

262784 FFFF2C 2017-08-08 05:55:00+03 10800

262785 FFFF43 2017-07-20 20:42:00+03 78500

262786 FFFFA8 2017-08-08 04:45:00+03 28800

262787 FFFFF7 2017-07-01 22:12:00+03 73600

[262788 rows x 3 columns]

...............................................................................................

flights

flight\_id flight\_no ... actual\_departure actual\_arrival

0 1185 PG0134 ... \N \N

1 3979 PG0052 ... \N \N

2 4739 PG0561 ... \N \N

3 5502 PG0529 ... \N \N

4 6938 PG0461 ... \N \N

... ... ... ... ... ...

33116 33117 PG0063 ... 2017-08-02 19:25:00+03 2017-08-02 20:10:00+03

33117 33118 PG0063 ... 2017-07-28 19:30:00+03 2017-07-28 20:15:00+03

33118 33119 PG0063 ... \N \N

33119 33120 PG0063 ... 2017-08-01 19:26:00+03 2017-08-01 20:12:00+03

33120 33121 PG0063 ... \N \N

[33121 rows x 10 columns]

...............................................................................................

seats

aircraft\_code seat\_no fare\_conditions

0 319 2A Business

1 319 2C Business

2 319 2D Business

3 319 2F Business

4 319 3A Business

... ... ... ...

1334 773 48H Economy

1335 773 48K Economy

1336 773 49A Economy

1337 773 49C Economy

1338 773 49D Economy

[1339 rows x 3 columns]

...............................................................................................

ticket\_flights

ticket\_no flight\_id fare\_conditions amount

0 0005432159776 30625 Business 42100

1 0005435212351 30625 Business 42100

2 0005435212386 30625 Business 42100

3 0005435212381 30625 Business 42100

4 0005432211370 30625 Business 42100

... ... ... ... ...

1045721 0005435097522 32094 Economy 5200

1045722 0005435097521 32094 Economy 5200

1045723 0005435104384 32094 Economy 5200

1045724 0005435104352 32094 Economy 5200

1045725 0005435104389 32094 Economy 5200

[1045726 rows x 4 columns]

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tickets

ticket\_no book\_ref passenger\_id

0 0005432000987 06B046 8149 604011

1 0005432000988 06B046 8499 420203

2 0005432000989 E170C3 1011 752484

3 0005432000990 E170C3 4849 400049

4 0005432000991 F313DD 6615 976589

... ... ... ...

366728 0005435999869 D730BA 0474 690760

366729 0005435999870 D730BA 6535 751108

366730 0005435999871 A1AD46 1596 156448

366731 0005435999872 7B6A53 9374 822707

366732 0005435999873 7B6A53 7380 075822

[366733 rows x 3 columns]

table: aircrafts\_data

('aircraft\_code', 'character(3)')

('model', 'jsonb')

('range', 'integer')

table: airports\_data

('airport\_code', 'character(3)')

('airport\_name', 'jsonb')

('city', 'jsonb')

('coordinates', 'point')

('timezone', 'text')

table: boarding\_passes

('ticket\_no', 'character(13)')

('flight\_id', 'integer')

('boarding\_no', 'integer')

('seat\_no', 'character varying(4)')

table: bookings

('book\_ref', 'character(6)')

('book\_date', 'timestamp with time zone')

('total\_amount', 'numeric(10,2)')

table: flights

('flight\_id', 'integer')

('flight\_no', 'character(6)')

('scheduled\_departure', 'timestamp with time zone')

('scheduled\_arrival', 'timestamp with time zone')

('departure\_airport', 'character(3)')

('arrival\_airport', 'character(3)')

('status', 'character varying(20)')

('aircraft\_code', 'character(3)')

('actual\_departure', 'timestamp with time zone')

('actual\_arrival', 'timestamp with time zone')

table: seats

('aircraft\_code', 'character(3)')

('seat\_no', 'character varying(4)')

('fare\_conditions', 'character varying(10)')

table: ticket\_flights

('ticket\_no', 'character(13)')

('flight\_id', 'integer')

('fare\_conditions', 'character varying(10)')

('amount', 'numeric(10,2)')

table: tickets

('ticket\_no', 'character(13)')

('book\_ref', 'character(6)')

('passenger\_id', 'character varying(20)')

Table: aircrafts\_data

aircraft\_code 0

model 0

range 0

dtype: int64

Table: airports\_data

airport\_code 0

airport\_name 0

city 0

coordinates 0

timezone 0

dtype: int64

Table: boarding\_passes

ticket\_no 0

flight\_id 0

boarding\_no 0

seat\_no 0

dtype: int64

Table: bookings

book\_ref 0

book\_date 0

total\_amount 0

dtype: int64

Table: flights

flight\_id 0

flight\_no 0

scheduled\_departure 0

scheduled\_arrival 0

departure\_airport 0

arrival\_airport 0

status 0

aircraft\_code 0

actual\_departure 0

actual\_arrival 0

dtype: int64

Table: seats

aircraft\_code 0

seat\_no 0

fare\_conditions 0

dtype: int64

Table: ticket\_flights

ticket\_no 0

flight\_id 0

fare\_conditions 0

amount 0

dtype: int64

Table: tickets

ticket\_no 0

book\_ref 0

passenger\_id 0

dtype: int64

Basic Analysis

How many Planes have more than 100 seats?

aircraft\_code num\_seats

0 319 116

1 320 140

2 321 170

3 733 130

4 763 222

5 773 402

6 CN1 12

7 CR2 50

8 SU9 97

How the no of tickets booked with the time

calculate the average charges for each aircraft with different fare conditions

fare\_conditions aircraft\_code avg(amount)

0 Business 319 113550.557703

1 Economy 319 38311.402347

2 Business 321 34435.662664

3 Economy 321 11534.974764

4 Business 733 41865.626175

5 Economy 733 13985.152000

6 Business 763 82839.842866

7 Economy 763 27594.721829

8 Business 773 57779.909435

9 Comfort 773 32740.552889

10 Economy 773 19265.225693

11 Economy CN1 6568.552345

12 Economy CR2 13207.661102

13 Business SU9 33487.849829

14 Economy SU9 11220.183400

Analyzing occupancy rate

For each aircraft, calculate total revenue per year and the average revenue per ticket

aircraft\_code tickets\_count total\_revenue avg\_revenue\_per\_ticket

0 319 52853 2706163100 51201

1 321 107129 1638164100 15291

2 733 86102 1426552100 16568

3 763 124774 4371277100 35033

4 773 144376 3431205500 23765

5 CN1 14672 96373800 6568

6 CR2 150122 1982760500 13207

7 SU9 365698 5114484700 13985

Calculate the average occupancy per aircraft.

aircraft\_code booked\_seats num\_seats occupancy\_rate

0 319 53.583181 116 0.461924

1 321 88.809231 170 0.522407

2 733 80.255462 130 0.617350

3 763 113.937294 222 0.513231

4 773 264.925806 402 0.659019

5 CN1 6.004431 12 0.500369

6 CR2 21.482847 50 0.429657

7 SU9 56.812113 97 0.585692

calculate how much the total annual turnover could increase by giving all aircraft a 10% higher occupancy rate

aircraft\_code total\_revenue

0 319 2706163100

1 321 1638164100

2 733 1426552100

3 763 4371277100

4 773 3431205500

5 CN1 96373800

6 CR2 1982760500

7 SU9 5114484700