Database Basics MS SQL Exam – 16 Apr 2019

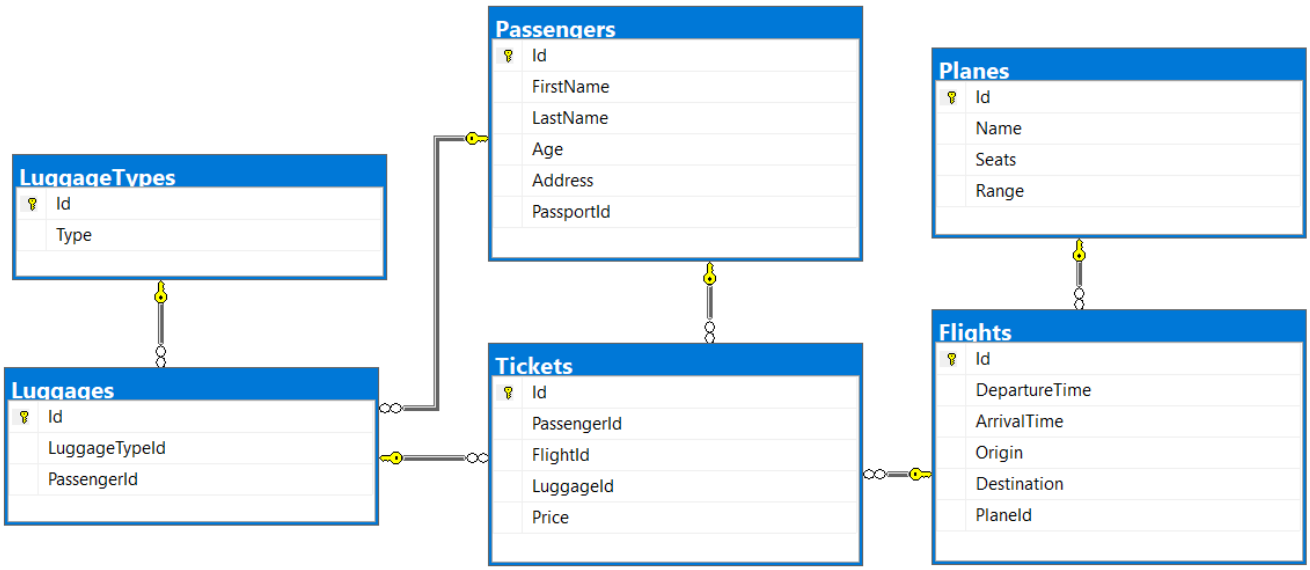
Exam problems for the "Database Basics" course @ SoftUni.

Submit your solutions in the SoftUni Judge system at https://judge.softuni.bg/

Airport

Section 1. DDL (30 pts)

You are given an E/R Diagram of the Airport:



Create a database called **`Airport`**. You need to create **6 tables**:

- **`Planes`** – contains information about the **planes**.
- **`Flights`** – contains information about the **flights**.
- **`Passengers`** – contains information about the **passengers**
- **`LuggageTypes`** – contains information about the **type of luggage's**.
- **`Flights`** – contains information about the **flights**.
  - Each **`flight`** has a **`plane`**.
- **`Luggages`** – contains information about the **luggage's**.
  - Each **`luggage`** has a **`luggage type`**.
- **`Tickets`** – contains information about the **tickets**.
  - Each **`ticket`** has a **passenger**.
  - Each **`ticket`** has a **flight**.
  - Each **`ticket`** has a **luggage**.

Planes

Column Name	Data Type	Constraints
Id	**Integer** from **0** to **2,147,483,647**	Unique table **identificator**, **Identity**
Name	**String** up to 30 symbols	**NULL** is **not** allowed

Seats	**Integer** from **0** to **2,147,483,647**	**NULL** is **not** allowed
Range	**Integer** from **0** to **2,147,483,647**	**NULL** is **not** allowed

Flights

Column Name	Data Type	Constraints
Id	**Integer** from **0** to **2,147,483,647**	Unique table **identificator**, **Identity**
DepartureTime	**Datetime**	None
ArrivalTime	**Datetime**	None
Origin	**String** up to 50 symbols	**NULL** is **not** allowed
Destination	**String** up to 50 symbols	**NULL** is **not** allowed
PlaneId	**Integer** from **0** to **2,147,483,647**	**NULL** is **not** allowed, Relationship with table Planes

Passengers

Column Name	Data Type	Constraints
Id	**Integer** from **0** to **2,147,483,647**	Unique table **identificator**, **Identity**
FirstName	**String** up to 30 symbols	**NULL** is **not** allowed
`LastName`	**String** up to 30 symbols	**NULL** is **not** allowed
`Age`	**Integer** from **0** to **2,147,483,647**	**NULL** is **not** allowed
`Address`	**String** up to 30 symbols	**NULL** is **not** allowed
`PassportId`	**String** with **exactly 11** symbols	**NULL** is **not** allowed

LuggageTypes

Column Name	Data Type	Constraints
Id	**Integer** from **0** to **2,147,483,647**	Unique table **identificator**, **Identity**
Type	**String** up to 30 symbols	**NULL** is **not** allowed

Luggages

Column Name	Data Type	Constraints
Id	**Integer** from **0** to **2,147,483,647**	Unique table **identificator**, **Identity**
`LuggageTypeId`	**Integer** from **0** to **2,147,483,647**	**NULL** is **not** allowed, Relationship with table **LuggageTypes**
`PassengerId`	**Integer** from **0** to **2,147,483,647**	**NULL** is **not** allowed, Relationship with table **Passengers**

Tickets

Column Name	Data Type	Constraints
Id	**Integer** from **0** to **2,147,483,647**	Unique table **identificator**, **Identity**
PassengerId	**Integer** from **0** to **2,147,483,647**	**NULL** is **not** allowed, Relationship with table **Passengers**
FlightId	**Integer** from **0** to **2,147,483,647**	**NULL** is **not** allowed, Relationship with table **Flights**
LuggageId	**Integer** from **0** to **2,147,483,647**	**NULL** is **not** allowed, Relationship with table **Luggages**
Price	**Decimal** number with **two-digit** precision	**NULL** is **not** allowed

1. Database Design

Submit all of yours **create statements** to Judge (only creation of tables).

Section 2. DML (10 pts)

Before you start, you must import "`DataSet-Airport.sql`". If you have created the structure correctly, the data should be successfully inserted without any errors.

In this section, you have to do some data manipulations:

2. Insert

Insert some sample data into the database. Write a query to add the following records into the corresponding tables. **All Ids should be auto-generated**.

Planes

Name	Seats	Range
Airbus 336	112	5132
Airbus 330	432	5325
Boeing 369	231	2355
Stelt 297	254	2143
Boeing 338	165	5111
Airbus 558	387	1342
Boeing 128	345	5541

Luggage Types

Type
Crossbody Bag
School Backpack
Shoulder Bag

3. Update

Make all flights to "**Carlsbad**" 13% more expensive.

4. Delete

Delete all flights to "**Ayn Halagim**".

Section 3. Querying (40 pts)

You need to start with a fresh dataset, so recreate your DB and import the sample data again (`DataSet-Bitbucket.sql`).

5. Trips

Select all **flights** from the database. Order them by **origin** (ascending) and **destination** (ascending).

Examples

Origin	Destination
Abelheira	Sabanitas
Adirejo	Koblain

Alfena	Makariv
Aubagne	Kitahama
…	…

6. The "Tr" Planes

Select all of the **planes,** which name contains "**tr**". Order them by **id** (ascending), **name** (ascending), **seats** (ascending) and **range** (ascending).

Examples

Id	Name	Seats	Range
31	Trunyx cpp	195	2653
86	Yakitri	321	1360
87	Trilith	223	4375
…	…	…	…

7. Flight Profits

Select the total profit for each flight from database. Order them by **total price** (descending), **flight id** (ascending).

Examples

FlightId	Price
58	828.43
43	819.84
…	…

8. Passengers and Prices

Select top **10** records from passengers along with the price for their tickets. Order them by **price** (descending), **first name** (ascending) and **last name** (ascending).

Examples

FirstName	LastName	Price
Brittne	Leggin	447.82
Adolphe	Juste	440.12
Rudyard	Kaveney	439.96
…	…	…

9. Most Used Luggage's

Examples

Select luggage type and how many times was used by **persons**. Sort by **count** (descending) and **luggage type** (ascending).

Type	MostUsedLuggage
Garment Bag	19
Wheeled Business Case	19
Duffel Bag	16
…	..

10. Passenger Trips

Select the **full name** of the passengers with their trips (**origin** - **destination**). Order them by **full name** (ascending), **origin** (ascending) and **destination** (ascending).

Examples

Full Name	Origin	Destination
Adina Uvedale	Lawa-an	Hulei
Adolphe Juste	Boto	Pantubig
Adolphe Juste	Codrington	Kasiyan
…	…	..

11. Non Adventures People

Select all people who don't have tickets. Select their **first name**, **last name** and **age** .Order them by **age** (descending), **first name** (ascending) and **last name** (ascending).

Examples

First Name	Last Name	Age
Felipa	Wabe	89
Darius	Ellissen	87
Eleen	Ummfrey	86
…	…	..

12. Lost Luggage's

Select **all passengers** who **don't** have luggage's. Select their **passport id** and **address**. Order the results by **passport id** (ascending) and **address** (ascending).

Examples

Passport Id	Address
105-40-7273	4 Haas Park
135-11-2922	435 Marquette Terrace
165-12-7011	2056 Kedzie Pass
...	..

13. Count of Trips

Select **all passengers** and their count of trips. Select **the first name**, **last name** and **count of trips**. Order the results by **total trips** (descending), **first name** (ascending) and **last name** (ascending).

Examples

First Name	Last Name	Total Trips
Adolphe	Juste	5
Neddie	Hugill	4
Ashley	Peterkin	3
...	...	..

14. Full Info

Select all passengers who have **trips**. Select their **full name** (first name – last name), **plane name**, trip (in format {**origin**} - {**destination**}) and luggage type. Order the results by **full name** (ascending), **name** (ascending), **origin** (ascending), **destination** (ascending) and **luggage type** (ascending).

Examples

Full Name	Plane Name	Trip	Luggage Type
Adina Uvedale	Feedspan	Lawa-an - Hulei	Wheeled Business Case
Adolphe Juste	Babbleopia	Usagara - Ikhtiman	Upright Luggage
Adolphe Juste	Feednation	Le Mans - Grazhdanka	Duffel Bag
...	...	...	...

15. Most Expensive Trips

Select **all passengers** who have **flights**. Select their **first name**, **last name**, **destination** and **price for the ticket**. Take only the ticket with highest price for user. Order the results by **price** (descending), **first name** (ascending), **last name** (ascending) and **destination** (ascending).

Examples

First Name	Last Name	Destination	Price
Brittne	Leggin	Quitilipi	447.82
Adolphe	Juste	Pantubig	440.12
Rudyard	Kaveney	Kynopiastes	439.96
…	…	…	…

16. Destinations Info

Select **all destinations** and trips count to them. Sort the result by **trips count** (descending) and **destination name** (ascending).

Examples

Destination	FilesCount
Daniwato	3
Kobenhavn	3
San Lorenzo	3
…	…

17. PSP

Select **all planes** with their **name**, **seats count** and **passengers count**. Order the results by **passengers count** (descending), **plane name** (ascending) and **seats** (ascending)

Examples

Name	Seats	Passengers Count
Jabberbean	56	6
Youbridge	159	5
Yoveo	247	5
…	…	…

Section 4. Programmability (20 pts)

18. Vacation

Create a **user defined function**, named **udf_CalculateTickets(@origin, @destination, @peopleCount)** that receives an origin (town name), destination (town name) and people count.

The function must return the total price in format "**Total price {price}**"

- If people count is less or equal to zero return – "**Invalid people count!**"
- If flight is invalid return – "**Invalid flight!**"

Example:

Query
`SELECT dbo.udf_CalculateTickets('Kolyshley','Rancabolang', 33)`
Output
`Total price 2419.89`

Query
`SELECT dbo.udf_CalculateTickets('Kolyshley','Rancabolang', -1)`
Output
`Invalid people count!`

Query
`SELECT dbo.udf_CalculateTickets('Invalid','Rancabolang', 33)`
Output
`Invalid flight!`

19. Wrong Data

Create a **user defined stored procedure**, named **usp_CancelFlights**
The procedure must cancel all flights on which the arrival time is before the departure time. Cancel means you need to leave the departure and arrival time empty.

Example:

Query
`EXEC usp_CancelFlights`
Output
`(49 rows affected)`

20. Deleted Planes

Create a new table "**DeletedPlanes**" with columns **(Id,Name,Seats, Range)**. Create a **trigger**, which fires when planes are deleted. After deleting the planes, **insert all of the data into the new table** "**DeletedPlanes**".

Note: Submit only your **CREATE TRIGGER** statement!

Example usage:

Query

`DELETE Tickets`
`WHERE FlightId IN (SELECT Id FROM Flights WHERE PlaneId = 8)`
 	
`DELETE FROM Flights`
`WHERE PlaneId = 8`
 	
`DELETE FROM Planes`
`WHERE Id = 8`

Response
`(1 rows affected)` `(1 rows affected)` `(1 rows affected)` `(1 rows affected)`