# Database Basics MS SQL Exam – 16 Oct 2021

**Exam problems for the** [**"Database Basics" course @ SoftUni**](https://softuni.bg/trainings/3531/ms-sql-september-2021)**.**

**Submit your solutions in the SoftUni Judge system at** [**judge**](https://judge.softuni.org/Contests/3229/Databases-MSSQL-Server-Exam-16-October-2021)**.**

# Section 1. DDL (30 pts)

You have been given the E/R Diagram of the CigarShop



Create a database called **CigarShop**. You need to create **7 tables**:

* **Sizes** – contains information about the cigar's length and ring range.
* **Tastes** – contains information about the cigar's taste type, taste strength, and image of the taste.
* **Brands** – contains information about the cigar's brand name and brand description.
* **Cigars** – contains information for every single cigar.
* **Addresses**– contains information about the clients' address details.
* **Clients** – contains information about the customers that buy cigars.
* **ClientsCigars** – mapping table between clients and cigars.

**Sizes**

|  |  |  |
| --- | --- | --- |
| **Column Name** | **Data Type** | **Constraints** |
| Id | Integer from 0 to 2,147,483,647. | PK, Unique table identification, Identity |
| Length | Integer from 0 to 2,147,483,647. | Length should be between 10 cm. and 25 cm, null is not allowed. |
| RingRange | Decimal number with two-digit precision. | RingRange should be between 1.5 cm. and 7.5 cm, null is not allowed. |

**Tastes**

|  |  |  |
| --- | --- | --- |
| **Column Name** | **Data Type** | **Constraints** |
| Id | Integer from 0 to 2,147,483,647. | PK, Unique table identification, Identity |
| TasteType | String up to 20 symbols. | Null is not allowed. |
| TasteStrength | String up to 15 symbols. | Null is not allowed. |
| ImageURL | String up to 100 symbols, Unicode. | Null is not allowed. |

**Brands**

|  |  |  |
| --- | --- | --- |
| **Column Name** | **Data Type** | **Constraints** |
| Id | Integer from 0 to 2,147,483,647. | PK, Unique table identification, Identity |
| BrandName | String up to 30 symbols. | Unique, Null is not allowed. |
| BrandDescription | String with maximum length. | Null is allowed. |

**Cigars**

|  |  |  |
| --- | --- | --- |
| **Column Name** | **Data Type** | **Constraints** |
| Id | Integer from 0 to 2,147,483,647. | PK, Unique table identification, Identity |
| CigarName | String up to 80 symbols. | Null is not allowed. |
| BrandId | Integer from 0 to 2,147,483,647. | Relationship with table Brands. Null is not allowed. |
| TastId | Integer from 0 to 2,147,483,647. | Relationship with table Tastes. Null is not allowed. |
| SizeId | Integer from 0 to 2,147,483,647. | PK, Relationship with table Sizes. Null is not allowed. |
| PriceForSingleCigar | A decimal number used for money calculations. | Null is not allowed. |
| ImageURL | String up to 100 symbols, Unicode. | Null is not allowed. |

**Addresses**

|  |  |  |
| --- | --- | --- |
| **Column Name** | **Data Type** | **Constraints** |
| Id | Integer from 0 to 2,147,483,647. | PK, Unique table identification, Identity. |
| Town | String up to 30 symbols. | Null is not allowed. |
| Country | String up to 30 symbols, Unicode | Null is not allowed. |
| Streat | String up to 100 symbols, Unicode | Null is not allowed. |
| ZIP | String up to 20 symbols. | Null is not allowed. |

**Clients**

|  |  |  |
| --- | --- | --- |
| **Column Name** | **Data Type** | **Constraints** |
| Id | Integer from 0 to 2,147,483,647. | PK, Unique table identification, Identity. |
| FirstName | String up to 30 symbols, Unicode. | Null is not allowed. |
| LastName | String up to 30 symbols, Unicode. | Null is not allowed. |
| Email | String up to 50 symbols, Unicode. | Null is not allowed. |
| AddressId | Integer from 0 to 2,147,483,647 | Relationship with table Addresses. Null is not allowed. |

**ClientsCigars**

|  |  |  |
| --- | --- | --- |
| **Column Name** | **Data Type** | **Constraints** |
| ClientId | Integer from 0 to 2,147,483,647 | PK, Unique table identification, Relationship with table Clients, Required |
| CigarId | Integer from 0 to 2,147,483,647 | PK, Unique table identification, Relationship with table Cigars, Required |

**N.B: Keep in mind that Judge doesn’t accept “ALTER” statement and square brackets naming, when the names are not keywords.**

## Database design

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

# Section 2. DML (10 pts)

**Before you start you have to import "*01-DDL-Data-Seeder.sql* ". If you have created the structure correctly the data should be successfully inserted.**

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

## Insert

Let us **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.

**Cigars**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CigarName** | **BrandId** | **TastId** | **SizeId** | **PriceForSingleCigar** | **ImageURL** |
| COHIBA ROBUSTO | 9 | 1 | 5 | 15.50 | cohiba-robusto-stick\_18.jpg |
| COHIBA SIGLO I | 9 | 1 | 10 | 410.00 | cohiba-siglo-i-stick\_12.jpg |
| HOYO DE MONTERREY LE HOYO DU MAIRE | 14 | 5 | 11 | 7.50 | hoyo-du-maire-stick\_17.jpg |
| HOYO DE MONTERREY LE HOYO DE SAN JUAN | 14 | 4 | 15 | 32.00 | hoyo-de-san-juan-stick\_20.jpg |
| TRINIDAD COLONIALES | 2 | 3 | 8 | 85.21 | trinidad-coloniales-stick\_30.jpg |

DROP TABLE Addresses

DROP TABLE Brands

DROP TABLE Cigars

DROP TABLE Clients

DROP TABLE ClientsCigars

DROP TABLE Sizes

DROP TABLE Tastes

**Addresses**

|  |  |  |  |
| --- | --- | --- | --- |
| **Town** | **Country** | **Streat** | **ZIP** |
| Sofia | Bulgaria | 18 Bul. Vasil levski | 1000 |
| Athens | Greece | 4342 McDonald Avenue | 10435 |
| Zagreb | Croatia | 4333 Lauren Drive | 10000 |

## Update

We’ve decided to increase the price of some **cigars by 20%**. Update the table **Cigars**and increase the price of all cigars, which **TasteType** is "**Spicy**" by **20%**. Also add the text "**New description**" to every brand, which does not has BrandDescription.

## Delete

In table Addresses, delete every country which name starts with '**C**', keep in mind that could be foreign key constraint conflicts.

# Section 3. Querying (40 pts)

**You need to start with a fresh dataset, so recreate your DB and import the sample data again (01-DDL-Data-Seeder.sql).**

## Cigars by Price

Select all **cigars** ordered by **price** (ascending) then by cigar name (descending).

Required columns:

* CigarName
* PriceForSingleCigar
* ImageURL

### Example:

|  |  |  |
| --- | --- | --- |
| **CigarName** | **PriceForSingleCigar** | **ImageURL** |
| H.UPMANN NO. 2 | 5.45 | h-upmann-magnum-50\_6\_4\_1\_9.png |
| EL-REY-DEL-MUNDO DEMI TASSE | 11.45 | EL-REY-DEL-MUNDO-magnum-50\_6\_4\_1\_9.jpg |
| VEGUEROS TAPADOS | 15.62 | VEGUEROS-open-junior\_1\_1\_2\_1\_1\_1\_4\_1\_1\_1\_1\_1\_1\_1\_1\_2\_4\_1\_9.jpg |
| BOLIVAR CORONAS JUNIOR | 17.34 | bolivar-coronas-junior.jpg |
| … | … | … |

## Cigars by Taste

Select all **cigars** with "**Earthy**" or "**Woody**" tastes. Order results by PriceForSingleCigar (descending).

Required columns:

* Id
* CigarName
* PriceForSingleCigar
* TasteType
* TasteStrength

### Example:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Id** | **CigarName** | **PriceForSingleCigar** | **TasteType** | **TasteStrength** |
| 18 | TRINIDAD CASILDA COLECCION HABANOS 2019 | 756.82 | Woody | Medium |
| 25 | RAMON ALLONES SMALL CLUB CORONAS | 567.34 | Earthy | Medium to Full |
| 39 | MONTECRISTO OPEN MASTER TUBOS | 555.45 | Earthy | Medium to Full |
| 38 | MONTECRISTO OPEN JUNIOR | 545.45 | Woody | Medium |
| … | … | … | … | … |

## Clients without Cigars

Select all clients **without** cigars. Order them by name (ascending).

Required columns:

* Id
* ClientName – customer’s first and last name, concatenated with space
* Email

### Example:

|  |  |  |
| --- | --- | --- |
| **Id** | **ClientName** | **Email** |
| 8 | Brenda Wallace | Wallace.khan@gmail.com |
| 10 | Harry Jones | 5ornob.Jones@gmail.com |
| 7 | Jason Hamilton | nob.Jason@gmail.com |

## First 5 Cigars

Select the **first 5 cigars** that are at least **12cm** long and contain "**ci**" in the cigar name or price for a single cigar is bigger than **$50** and ring range is bigger than **2.55**. Order the result by cigar name (**ascending**), then by price for a single cigar (**descending**).

Required columns:

* CigarName
* PriceForSingleCigar
* ImageURL

### Example:

|  |  |  |
| --- | --- | --- |
| **CigarName** | **PriceForSingleCigar** | **ImageURL** |
| COHIBA 1966 EDICION LIMITADA 2011 | 19.45 | cohiba-siglo-i-stick\_18.png |
| COHIBA BEHIKE 54 | 254.09 | cohiba-esplendidos-stick.jpg |
| FONSECA NO. 1 | 76.34 | FONSECA-50\_6\_4\_1\_9.jpg |
| HOYO-DE-MONTERREY EPICURE ESPECIAL | 98.89 | HOYO-DE-MONTERREY-siglo-i-stick\_18.jpg |
| HOYO-DE-MONTERREY EPICURE NO. 2 | 78.57 | HOYO-DE-MONTERREY-siglo-i-stick\_18.jpg |

## Clients with ZIP Codes

Select all clients which have addresses with **ZIP** code that contains **only digits**, and display they're the most expensive cigar. Order by client full name ascending.

Required columns:

* FullName
* Country
* ZIP
* CigarPrice – formated as **"${CigarPrice}"**

### Example:

|  |  |  |  |
| --- | --- | --- | --- |
| **FullName** | **Country** | **ZIP** | **CigarPrice** |
| Betty Wallace | Turkey | 13760 | $555.45 |
| Joan Peters | Japan | 06511 | $543.23 |
| Rachel Bishop | Andorra | 08043 | $555.45 |

## Cigars by Size

Select all clients which own **cigars**. Select their last name, average length, and ring range (rounded up to the next biggest integer) of their cigars. Order the results by **average cigar length** (descending).

### Example:

|  |  |  |
| --- | --- | --- |
| **LastName** | **CiagrLength** | **CiagrRingRange** |
| Miller | 20 | 5 |
| Riley | 19 | 3 |
| Ramirez | 18 | 5 |
| … | … |  |

# Section 4. Programmability (20 pts)

## Client with Cigars

Create a user-defined function, named **udf\_ClientWithCigars(@name)** that receives a client’s first name.

The function should return the total number of cigars that the client has:

### Example:

|  |
| --- |
| **Query** |
| **SELECT dbo.udf\_ClientWithCigars('Betty')** |
| **Output** |
| **5** |

## Search for Cigar with Specific Taste

Create a **stored procedure**, named **usp\_SearchByTaste(@taste)**, that receives taste type. The procedure must print full information about all cigars with the given tastes: **CigarName**, **Price, TasteType, BrandName, CigarLength, CigarRingRange**. Add "**$**" at the beginning of the price and "**cm**" at the end of both CigarLength and CigarRingRange. Order them by **CigarLength** (ascending), and **CigarRingRange**(descending).

### Example:

|  |  |  |
| --- | --- | --- |
| **Query** | | |
| **EXEC** **usp\_SearchByTaste** **'Woody'** | | |
| **Output** | | |
| **CigarName** | **Price** | **TasteType** | **BrandName** | **CigarLength** | **CigarRingRange** |
| BOLIVAR PETIT CORONAS | $18.76 | Woody | BOLIVAR | 10 cm | 2.90 cm |
| DAVIDOFF MILLENNIUM BLEND ROBUSTO | $86.45 | Woody | DAVIDOFF | 11 cm | 5.30 cm |
| H.UPMANN MAGNUM 50 TUBOS | $23.66 | Woody | H.UPMANN | 11 cm | 4.30 cm |
| … | … | … | … | … | … |