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Assignment 1 Data Visualization

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# Part 1

### Import and execute SQL Script from files

Download and import “create-databases” SQL script into MySQL Workbench. Run the script and create databases.

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### Query 1

Input the following query

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### Query 2

Input the following query

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### Task 1

1. Using query 2 change the points to read times by 10 and plus 100

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1. Change the Query 2 code to create a discount factor so the table now shows a discount header and changing the (point + 10) \*100

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### Task 2

Write a SQL query to return all the products in our database in the result set. I want you to show columns; name, unit price, and new column called new price which is based on this expression, (unit price \* 1.1)

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### Task 3

Create a new query to find all the customers with a birth date of > '1990-01-01'

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### Task 4

Select sql\_inventory. Write a query to find out the name of the product with most amount in stock.

The product with the most amount in stock is ‘Sweet Pea Sprouts’.

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### Task 5

Write a query to find out the name of the most expensive product.

The most expensive product is ‘Pork - Bacon, back Peameal’.

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### Task 6

Select sql\_store. Write a query to find out the first name, last name, address and the birthdate of the oldest customer.

The oldest customer is Thatcher Naseby, 548 Mosinee Center, 1993-07-17

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### Creating an EER Diagram

Database 🡪 Reverse Engineer (ctrl+r shortcut used)

Go through the steps to select the sql\_store schema.

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This is the resulting EER Diagram from the sql\_store schema.

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It is a star schema with the **orders** table at the centre.

**orders** table has primary key **order\_id** and foreign keys **customer\_id** (to **customers** table) and **shipper\_id** (to **shippers** table) and **status** (to **order\_statuses** table). It has a one-to-many relationship.

**customers** table has primary key **customer\_id**. It has a one-to-many relationship with **orders** table.

**shippers** table has primary key **shipper\_id**. It has a one-to-many relationship with **orders** table.

**order\_statuses** has primary key **order\_status\_id**. It has one-to-many relationship with **orders** table.

**order\_items** table has primary keys **order\_id** and **product\_id**. It has a many-to-one relationship with **orders** table.

**Products** table has primary key **product\_id**. It has a many-to-one relationship with **order\_items** table.

# Part 2 – World Database

### Import and execute SQL Script from files

Import SQL Script “world db” and then execute the script.

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### Task 1

Using COUNT, get the number of cities in the USA.

There are 274 cities in the USAA screenshot of a computer

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### Task 2

Find out what the population and average life expectancy Argentina (ARG) is.

The population of Argentina is 37,032,000 and average life expectancy of 75.1 years.

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### Task 3

Using ORDER BY, LIMIT, what country has the highest life expectancy?

Andorra has the highest life expectancy at 83.5 years

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### Task 4

Select 25 cities around the world that start with the letter 'F' in a single SQL query.

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### Task 5

Create a SQL statement to display columns Id, Name, Population from the city table and limit results to first 10 rows only.

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### Task 6

Create a SQL statement to find only those cities from city table whose population is larger than 2000000.

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### Task 7

Create a SQL statement to find all city names from city table whose name begins with “Be” prefix.

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### Task 8

Create a SQL statement to find only those cities from city table whose population is between 500000-1000000.

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### Task 9

Create a SQL statement to find a city with the lowest population in the city table.

The city with the lowest population is Adamstown.

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### Further Tasks

#### Task 4

Create a SQL statement to display columns Id, Name, Population from the city table and limit results to rows 31-40.

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#### Task 9

Create a SQL statement to display all cities from the city table sorted by Name in ascending order.

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#### Task 11

Create a SQL statement to find a country with the largest population in the country table.

The country with the largest population is China.

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### Bonus JOIN Questions

#### Task 1

Create a SQL statement to find the capital of Spain (ESP).

The capital of Spain is Madrid.

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#### Task 2

Create a SQL statement to list all the languages spoken in the Caribbean region.

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#### Task 3

Create a SQL statement to find all cities from the Europe continent.

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### Creating an EER Diagram

Database 🡪 Reverse Engineer (ctrl+r shortcut used)

Go through the steps to select the world schema.

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This is the resulting EER Diagram

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Description automatically generated

The primary key for the **country** table is **code**.

The primary key for the **city** table is **ID**.

The primary key for the **countrylanguage** table is **Language**.

The foreign key for the **city** table is **CountryCode**.

The foreign key for the **countrylanguage** table is **CountryCode**.

# Interview Questions

#### What is a query?

A query is a request for data from a database table or combination of tables. It can be either a select query or an action query.

#### What is the SELECT statement?

SELECT statement is used to select data from a database, and the returned data is stored in a result-set.

#### What is the WHERE clause?

WHERE clause sets a condition or conditions for filtering the data.

#### What is the Primary Key?

The primary key is a column or multiple columns of a table which uniquely identifies each record of the table and is not null and unique.

#### What is a database?

A database is a structured storage space where the data is kept in tables and organised so that can be easily fetched, manipulated, and summarised.

#### List the different types of relationships in SQL and give examples.

Relationships are connections between entities.

One-to-one relationships – a relationship between two tables where each record in one table is associated with a maximum of one record from another table, e.g. one person has only one birthday.

One-to-many and many-to-one relationships – a relationship where one record in a table is associated with one or more records in another table, e.g. one country has many cities or many pupils study in one class.

Many-to-many relationships – a relationship where many records in a table can associate with many records in another table, e.g. a university student has many courses, and a course has many students.

#### What is normalization?

Normalisation is the process of database design that includes organising and restructuring data in a way which reduces data redundancy, dependency, duplication, and inconsistency.

#### Query 1

SELECT population FROM world

WHERE name = ‘Germany’;

#### Query 2

SELECT name

FROM world

WHERE name

LIKE ‘U%’;

#### Query 3

b) ‘name’ should be name

#### Query 4

SELECT name FROM world WHERE name LIKE ‘%a’ or name LIKE ‘%l’;

#### Query 5

SELECT name, population

FROM world

WHERE population

BETWEEN 1000000 and 1250000;