Data Management, Warehousing, And Analytics

Lab4: Introduction to Distributed Databases (Summer 2023)

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GitLab repo: https://git.cs.dal.ca/dugar/csci5408_s23_b00917961_arihant_dugar/-/tree/main/Lab4

Lab Exercise:

1. Setup local Database

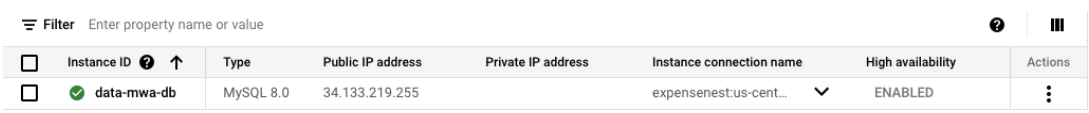
Using the below queries to setup the local database:

```
USE lab4;

CREATE TABLE User (
   id INT PRIMARY KEY AUTO_INCREMENT,
   name VARCHAR(255),
   email VARCHAR(255),
   phone VARCHAR(20),
   address VARCHAR(255)
);

CREATE TABLE Order_info (
   order_id INT PRIMARY KEY AUTO_INCREMENT,
   user_id INT,
   item_name VARCHAR(255),
   quantity INT,
   order_date DATE,
   FOREIGN KEY (user_id) REFERENCES User(id)
);
```

Added test user data to local database:

```
INSERT INTO User (name, email, phone, address) VALUES
('John Doe', 'johndoe@example.com', '1234567890', '123 Main Street'),
('Jane Smith', 'janesmith@example.com', '9876543210', '456 Elm Avenue');
```

2. Create Remote GCP Database for Inventory:



Added a new Inventory table:

```
CREATE TABLE Inventory (
   item_id INT PRIMARY KEY AUTO_INCREMENT,
   item_name VARCHAR(255),
   available_quantity INT
);
```

Added test data for inventory items:

```
INSERT INTO Inventory (item_name, available_quantity) VALUES ('Item 1', 10);
INSERT INTO Inventory (item_name, available_quantity) VALUES ('Item 2', 5);
INSERT INTO Inventory (item_name, available_quantity) VALUES ('Item 3', 8);
INSERT INTO Inventory (item_name, available_quantity) VALUES ('Item 4', 12);
INSERT INTO Inventory (item_name, available_quantity) VALUES ('Item 5', 3);
```

```
mysql> select * from Inventory;
+---------+-----------+--------------------+
| item_id | item_name | available_quantity |
+---------+-----------+--------------------+
|       1 | Item 1    |                 10 |
|       2 | Item 2    |                  5 |
|       3 | Item 3    |                  8 |
|       4 | Item 4    |                 12 |
|       5 | Item 5    |                  3 |
+---------+-----------+--------------------+
5 rows in set (0.03 sec)
```

3. **Java program to fetch items from remote database, create an order in local database, write the updated quantity back to the remote server.**

	order_id	user_id	item_name	quantity	order_date
▶	1	1	Item 2	1	2023-06-21
	2	1	Item 3	1	2023-06-21
	3	1	Item 5	1	2023-06-21
	4	1	Item 4	1	2023-06-21
	5	1	Item 1	1	2023-06-21
	6	1	Item 4	1	2023-06-21
	7	1	Item 1	1	2023-06-21
	NULL	NULL	NULL	NULL	NULL

```
mysql> select * from Inventory;
+---------+-----------+--------------------+
| item_id | item_name | available_quantity |
+---------+-----------+--------------------+
|       1 | Item 1    |                  8 |
|       2 | Item 2    |                  4 |
|       3 | Item 3    |                  7 |
|       4 | Item 4    |                 10 |
|       5 | Item 5    |                  2 |
+---------+-----------+--------------------+
5 rows in set (0.03 sec)
```

4. **Print Query execution time at each step**

```
Connected to the Google cloud remote database successfully!
Query execution time for fetching Inventory from Google Cloud: 134 ms
Connected to the local database successfully!
Query execution time for updating Order info in Local DB: 8 ms
Query execution time for updating Inventory record in Google Cloud: 56 ms
```

Source Code:

Source code for can be found in the repository:
https://git.cs.dal.ca/dugar/csci5408_s23_b00917961_arihant_dugar/-/tree/main/Lab4

Note: The DB instance in Google cloud is stopped to save credits.