Introduction

Quantigration, a technology solutions provider, faced challenges with scattered and inconsistent order and customer records, making data analysis and reporting challenging. To address this, a relational database was designed and implemented to streamline customer interactions, order tracking, and return management.

This project showcases the creation, optimization, and querying of the QuantigrationUpdates database, demonstrating core SQL competencies such as data modeling, schema updates, data import, filtering, and advanced querying. The solution enhances data integrity, ensures referential consistency, and provides actionable insights through targeted queries. The project's deliverables include a well-structured database, key performance queries, and the automation of essential business processes.

Step 1: Create a Database

Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 36 Server version: 5.5.62-0ubuntu0.14.04.1 (Ubuntu) Copyright (c) 2000, 2018, Oracle and/or its affiliates. All rights reserved. Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners. Type 'help;' or '\h' for help. Type '\c' to clear the current input statement. mysql>

CREATE DATABASE QuantigrationUpdates; SHOW DATABASES;

<pre>mysql> CREATE DATABASE QuantigrationUpdates; Query OK, 1 row affected (0.00 sec) mysql> show databases;</pre>
++ Database ++
information_schema Meier QuantigrationRMA QuantigrationUpdates classicmodels mysql performance_schema
7 rows in set (0.00 sec)

Creating Tables

Customers Table

CREATE TABLE Customers (

CustomerID INT PRIMARY KEY AUTO_INCREMENT,

FirstName VARCHAR(50) NOT NULL,

LastName VARCHAR(50) NOT NULL,

StreetAddress VARCHAR(255) NOT NULL,

City VARCHAR(100) NOT NULL,

8 rows in set (0.00 sec)

State CHAR(2) NOT NULL,

ZipCode CHAR(5) NOT NULL,

Telephone VARCHAR(15) UNIQUE NOT NULL,

CreatedAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP

);

ysql> USE QuantigrationUpdates; Database changed mysql> CREATE TABLE Customera(CustomerID INT,FirstName VARCHAR(25),LastName VARCHAR(25), -> Street VARCHAR(50),City VARCHAR(50),State VARCHAR(25),ZipCode INT,Telephone VARCHAR(15),PRIMARY KEY(CustomerID)); Query OK, 0 rows affected (0.11 sec) mysql> ALTER TABLE Customera -> RENAME TO Customers; Query OK, 0 rows affected (0.02 sec) mysql> DESCRIBE Customers; Field | Null | Key | Default | Extra | | Type CustomerID | int(11) NO PRI Θ FirstName varchar(25) YES NULL LastName varchar(25) YES NULL Street varchar(50) YES NULL City varchar(50) YES NULL varchar(25) YES State NULL ZipCode int(11) NULL YES Telephone | varchar(15) YES NULL

Orders Table

CREATE TABLE Orders (

OrderID INT PRIMARY KEY AUTO_INCREMENT, CustomerID INT NOT NULL, SKU VARCHAR(20) NOT NULL, Description TEXT NOT NULL, OrderDate TIMESTAMP DEFAULT CURRENT_TIMESTAMP, FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID) ON DELETE CASCADE);

CREATE INDEX idx_customer_id ON Orders(CustomerID);

mysql> CREATE 1 Y(OrderID), -> FOREIGN	TABLE Orders(O KEY(CustomerI						Description	VARCHAR(50),	PRIMARY K
	ws affected (0			Gub comer b	(dub come				
nysql> DESCRIB	E Orders;								
Field	+ Туре	Null	Key	Default	Extra	l			
OrderID	 int(11)	+ NO	+	+ Θ	+ 	+ I			
CustomerID	int(11)	YES	MUL	NULL	i	i			
SKU	varchar(20)	YES	i i	NULL	İ	İ			
Description	varchar(50)	YES	i i	NULL	İ	İ			
rows in set	+	+	++	+	+	+			

I created the Orders table. I assigned the primary key to OrderID and using the foreign key command, made a connection between the CustomerID primary key in the Customers table and CustomerID in this table.

sql> DESCR	IBE RMA;											
		+	++									
Field	Гуре	Null	Key	Default	Extra							
+-		+	++									
RMAID	int(11)	NO	PRI	Θ								
OrderID	int(11)	YES	MUL	NULL	I I							
Step	varchar(50)	YES	i i	NULL	i i							
Status	varchar(15)	YES		NULL	i i							
Reason	varchar(15)	YES		NULL	1							

The primary key in the RMA table is RMAID and OrderID is given a relationship to OrderID on the Orders table, making it a foreign key.

Updating Schema Based on New Requirements

Renaming "Customers" to "Collaborators"

Update your existing tables from "Customer" to "Collaborator" using SQL based on this change in requirements. Provide the SQL commands you ran against MySQL to complete this successfully in your answer:

a. Rename all instances of "Customer" to "Collaborator."

ALTER TABLE Customers RENAME TO Collaborators; ALTER TABLE Orders CHANGE CustomerID CollaboratorID INT;

Creating a View for Unified Data Representation

CREATE VIEW CollaboratorsView AS SELECT * FROM Collaborators;

```
mysql> CREATE VIEW Collaborator AS SELECT CustomerID AS CollaboratorID FROM Customers;
Query OK, 0 rows affected (0.06 sec)
```

mysql> DESCRIBE Co	ollaborato	rs; +	+		••
Field	Туре	Null	Key	Default	Extra
CollaboratorID	int(11)	+ NO	• 	+ Θ	++
1 row in set (0.0)	L sec)				

Used create view command to create a virtual table named "Collaborators." This allows for all data to be in one table rather than across several tables.

Step 2: Data Import and Querying

1. Import the data from each file into tables.

- Use the *QuantigrationUpdates* database, the three tables you created, and the three CSV files preloaded into Codio.
- Use the import utility of your database program to load the data from each file into the table of the same name. You will perform this step three times, once for each table.

```
mysql> LOAD DATA INFILE '/home/codio/workspace/customers.csv'
    -> INTO TABLE Customers
    -> FIELDS TERMINATED BY ','
    -> ENCLOSED BY ""
    -> lines terminated by '\r\n';
Query OK, 37994 rows affected (0.43 sec)
Records: 37994 Deleted: 0 Skipped: 0 Warnings: 0
mysql> LOAD DATA INFILE '/home/codio/workspace/orders.csv'
    -> INTO TABLE Orders
    -> FIELDS TERMINATED BY ','
    -> ENCLOSED BY ""
    -> lines terminated by '\r\n';
Query OK, 37994 rows affected (0.38 sec)
Records: 37994 Deleted: 0 Skipped: 0 Warnings: 0
mysql> LOAD DATA INFILE '/home/codio/workspace/rma.csv'
    -> INTO TABLE RMA
   -> FIELDS TERMINATED BY ','
   -> ENCLOSED BY ""
    -> lines terminated by '\r\n';
Query OK, 38162 rows affected (0.53 sec)
Records: 38162 Deleted: 0 Skipped: 0 Warnings: 0
```

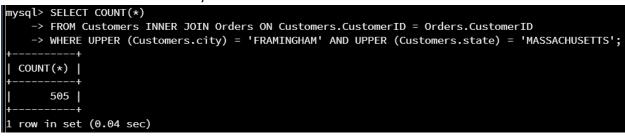
The above commands imported the customers, orders and rma csv files into the customers, orders and rma tables respectively.

56261 Damian Moyer 151 North Green Old Parkway Anaheim Minnesota 54268 3550179730 56279 Manuel Bishop 12 West Green New Street Philadelphia Minnesota 80708 2998357057 56338 Katie Greer 695 Hague Blvd. Madison Minnesota 12056 1518381109 56347 Gwendolyn Ellison 37 Old Avenue El Paso Minnesota 98109 938-080-33 56496 Ashley Conrad 42 Hague Drive El Paso Minnesota 16963 107014-57 56527 Chanda Everett 66 Milton Drive Garland Minnesota 62506 304062-830 56569 Jeffery Black 217 Nobel Blvd. Charlotte Minnesota 74252 694036-524 56604 Telly Conley 615 North Clarendon Freeway Madison Minnesota 93021 100-144-90	-> FROM	Customers						
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I validated the output using select * from each table, and with a limit of 10 records per table.

2. Write basic queries against imported tables to organize and analyze targeted data. For each query, replace the bracketed text with a screenshot of the query and its output. You should also include a brief, 1- to 3-sentence description of the output.

- Write an SQL query that returns the count of orders for customers located only in the city of Framingham, Massachusetts.
 - i. How many records were returned?



There are 505 records of customers located in Framingham, MA. The above query only returns data related to Framingham, Massachusetts between the Orders and Customers tables using an inner join command.

- Write an SQL query to select all of the customers located in the state of Massachusetts.
 - i. Use a WHERE clause to limit the number of records in the customers table to only those who are located in Massachusetts.
 - ii. Record an answer to the following question: How many records were returned?

mysql> SELECT * -> FROM Customers INNER JOIN Orders on Customers.CustomerID = Orders.CustomerID -> WHERE UPPER (Customers.state) = 'MASSACHUSETTS';

7291 ADV-48-10F Advanced Switch 10 GigE Copper/Fiber 44 port coppe	5				
76122 Everett Melendez 13 East Oak Parkway	Framingham	Massachusetts	1701 740058-0486	98887	7
6122 ADV-48-10F Advanced Switch 10 GigE Copper/Fiber 44 port coppe	5				
84092 Troy Curtis 32 Milton Boulevard	Houston	Massachusetts	73454 1024719839	98914	8
4092 ENT-48-10F Enterprise Switch 10GigE SFP+ 48 port					
81264 Kendall Wheeler 92 Rocky Oak Freeway	Charlotte	Massachusetts	9468 099-7594329	99222	8
1264 ADV-48-10F Advanced Switch 10 GigE Copper/Fiber 44 port coppe	2				
82949 James Sanford 68 South White Old Way	Garland	Massachusetts	19238 1700404229	99234	8
2949 BAS-48-1 C Basic Switch 10/100/1000 BaseT 48 port					
87351 Sherri Russell 61 New Street	Framingham	Massachusetts	1701 468621661	99417	8
7351 ENT-48-40F Enterprise Switch 40GigE SFP+ 48 port					
91078 Aisha Molina 777 North Clarendon Road	Raleigh	Massachusetts	61948 136-9793128	99470	9
1078 BAS-08-1 C Basic Switch 10/100/1000 BaseT 8 port					
91977 Jodi Stout 839 Cowley Street	Framingham	Massachusetts	1701 980563-8885	99689	9
1977 ENT-48-10F Enterprise Switch 10GigE SFP+ 48 port					
99439 Felix Fuller 75 Milton Freeway	Framingham	Massachusetts	1701 157-196-4035	99698	9
9439 ADV-24-10C Advanced Switch 10GigE Copper 24 port					
++++++	·····+	++-	+	+	+
ŧŧŧ	+				
982 rows in set (A A6 sec)					

There are 982 records returned. These are the last 9 records.

• Write a SQL query to insert four new records into the orders and customers tables using the following data:

i. Customers Tab	ole
------------------	-----

CustomerID	FirstName	LastName	StreetAddress	City	State	ZipCode	Telephone
100004	Luke	Skywalker	15 Maiden Lane	New York	NY	10222	212-555-1234
100005	Winston	Smith	123 Sycamore Street	Greensbor o	NC	27401	919-555-6623
100006	MaryAnne	Jenkins	1 Coconut Way	Jupiter	FL	33458	321-555-8907
100007	Janet	Williams	55 Redondo Beach Blvd	Torrence	CA	90501	310-555-5678

-> 10222, -> 27401, -> 33458, -> 90501, Query OK, 4 rcc Records: 4 Du mysql> SELECT -> FROM Cu	'212-555-12: '919-555-662 '321-555-890 '310-555-56 www.affected uplicates: 0 * istomers	34'),(100005, 23'),(100006, 97'),(100007, 78'); (0.03 sec) Warnings: (L00004, 'Luke', 'Skywalk , 'Winston', 'Smith', '12 , 'MaryAnne', 'Jenkins', , 'Janet', 'Williams', '9 CustomerID <=100007;	23 Sycamore S ⁺ '1 Coconut Wa	treet', ay', 'Ju	'Greensbord piter', 'Fl	b', 'NC', _',
CustomerID	FirstName	LastName	Street	City	State	ZipCode	Telephone
100005		Smith Jenkins	123 Sycamore Street	New York Greensboro Jupiter Torrence	NY NC FL CA	10222 27401 33458 90501	212-555-1234 919-555-6623 321-555-8907 310-555-5678
4 rows in set	(0.00 sec)						t

I added four new customer records into Customers. The query only retrieves the newly added using the less than greater than operators against their customer id numbers.

ii. Orders Table

OrderID	CustomerID	ѕки	Description
1204305	100004	ADV-24-10C	Advanced Switch 10GigE Copper 24 port
1204306	100005	ADV-48-10F	Advanced Switch 10 GigE Copper/Fiber 44 port copper 4 port fiber
1204307	100006	ENT-24-10F	Enterprise Switch 10GigE SFP+ 24 Port
1204308	100007	ENT-48-10F	Enterprise Switch 10GigE SFP+ 48 port

```
mysql> INSERT INTO Orders VALUES (1204305, 100004, 'ADV-24-10C', 'Advanced Switch 10GigE Copper 24
     /> inotki into orders vices (1204306, 100004, ADV 24 100 , Advanced Switch 10 GigE Copper/Fiber 44 port copper 4 port
/> fiber'), (1204307, 100006, 'ENT-24-10F', 'Enterprise Switch 10GigE SFP+ 24 Port'), (1204308, 100007,
-> 'ENT-48-10F', 'Enterprise Switch 10GigE SFP+ 48 port');
Query OK, 4 rows affected, 1 warning (0.02 sec)
Records: 4 Duplicates: 0 Warnings: 1
mysql> SELECT *
     -> FROM Orders
     -> WHERE CustomerID >= 100004 AND CustomerID <= 100007;
  OrderID | CustomerID | SKU
                                             | Description
  1204305
                    100004 | ADV-24-10C | Advanced Switch 10GigE Copper 24
port
                      I
  1204306
                    100005
                               ADV-48-10F | Advanced Switch 10 GigE Copper/Fiber 44 port coppe
                             I
                               ENT-24-10F |
  1204307
                    100006
                                               Enterprise Switch 10GigE SFP+ 24 Port
  1204308
                    100007
                               ENT-48-10F | Enterprise Switch 10GigE SFP+ 48 port
  rows in set (0.00 sec)
```

As above, I added four new orders into Orders. This query only retrieves the newly added orders using the less than greater than operators against customer id numbers.

- In the customers table, perform a query to count all records where the city is Woonsocket, Rhode Island.
 - i. How many records are in the customers table where the field "city" equals "Woonsocket"?

mysql>	SELECT COUNT(*)
->	FROM Customers
->	WHERE UPPER(Customers.city) = 'WOONSOCKET' AND UPPER (Customers.state) = 'RHODE ISLAND';
+	+
COUN	Γ(*)
+	+
	7
+	+
1 row ⁻	in set (0.01 sec)

The above query returned that there are 7 records where the city is Woonsocket, Rhode Island.

- In the rma database, update a customer's records.
 - i. Write an SQL statement to select the current fields of *status* and *step* for the record in the *rma* table with an *orderid* value of "5175."
 - 1. What are the current status and step?

mysql> SELECT Status, Step
-> FROM RMA
-> WHERE RMA.OrderID = 5175;
+++
Status Step
Pending Awaiting customer Documentation
1 row in set (0.00 sec)

The current status is pending and it's in the 'Awaiting customer documentation' step of the process.

- ii. Write an SQL statement to update the *status* and *step* for the *orderid*, 5175 to *status* = "Complete" and *step* = "Credit Customer Account."
 - 1. What are the updated *status* and *step* values for this record?

<pre>mysql> SELECT Status, Step FROM RMA -> WHERE RMA.OrderID = 5175;</pre>					
Status	Step				
Complete	Credit Customer Account				
1 row in set (0.00 sec)					

Status is now complete, and the step is "Credit Customer Account."

• Delete rma records.

i. Write an SQL statement to delete all records with a reason of "Rejected." DELETE FROM RMA WHERE Reason = 'Rejected';

1. How many records were deleted? 596.

99980	63451	Awaiting customer Documer	tation Pending	0ther	
99985	60073	Awaiting customer Documer	ntation Pending	0ther	
99987	62115	Awaiting customer Documer	ntation Pending	0ther	
99989	67477	Awaiting customer Documer	ntation Pending	Other	
99991	93440	Awaiting customer Documer	ntation Pending	0ther	
99992	41321	Awaiting customer Documer	ntation Pending	0ther	
99995	35748	Awaiting customer Documer	ntation Pending	Other	
99996	40756	Awaiting customer Documer	ntation Pending	0ther	
99998	87613	Awaiting customer Documer	ntation Pending	0ther	
	·+		·+++	++	
7566 rows in set (0.02 sec)					

Create an output file of the required query results. Write an SQL statement to list the contents of the *orders* table and send the output to a file that has a .csv extension.

99979	84528	ENT-48-10F	Enterprise Switch 10GigE SFP+ 48 port		
99985	84566	ENT-24-10F	Enterprise Switch 10GigE SFP+ 24 Port		
99993	94111	ENT-24-10F	Enterprise Switch 10GigE SFP+ 24 Port		
99996	89164	BAS-08-1 C	Basic Switch 10/100/1000 BaseT 8 port		
99998	71161	ADV-24-10C	Advanced Switch 10GigE Copper 24 port		
1204305	100004	ADV-24-10C	Advanced Switch 10GigE Copper 24		
port					
1204306	100005	ADV-48-10F	Advanced Switch 10 GigE Copper/Fiber 44 port coppe		
1204307	100006	ENT-24-10F	Enterprise Switch 10GigE SFP+ 24 Port		
1204308	100007	ENT-48-10F	Enterprise Switch 10GigE SFP+ 48 port		
+	+	++	+		
37998 rows	37998 rows in set (0.03 sec)				

The four new records are returned to the table.

Query used: SELECT * FROM Orders INTO OUTFILE '/home/codio/workspace/OrdersUpdates.csv' FIELDS TERMINATED BY ',' ENCLOSED BY "" LINES TERMINATED BY '\n';

This SQL project demonstrates proficiency in database design, data manipulation, and querying skills relevant to a data analyst role. The project includes:

- Database and table creation
- Schema modification to meet evolving requirements
- Efficient data import and validation
- SQL queries for analytical insights
- Data updates and deletions
- Exporting results for reporting