

## **THIRD PARTY LOGISTICS DATABASE**

### **Milestone: Implementation in MySQL**

Group 05

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We have implemented the relational model into MySQL considering all the key constraints to make a flawless schema. We wrote several queries to develop the schema and further injected data using a website.

### Queries to develop the schema:

```
CREATE TABLE customer
(customer_id CHAR(3) NOT NULL PRIMARY KEY,
customer_name VARCHAR(80) NOT NULL UNIQUE,
address varchar(120) UNIQUE,
poc VARCHAR (20));
```

```
CREATE TABLE CONTRACT
( contract_id CHAR(5) NOT NULL PRIMARY KEY,
contract_description VARCHAR(80) NULL,
line_of_business CHAR(4) NOT NULL,
CONSTRAINT C1 CHECK (line_of_business IN ("TRAN", "WARE", "SOUR")),
business_head VARCHAR(30) NOT NULL,
customer_id CHAR(3),
start_date DATE,
end_date DATE,
FOREIGN KEY (customer_id) REFERENCES customer (customer_id));
```

```
CREATE TABLE supplier
(supplier_id CHAR(5) NOT NULL PRIMARY KEY,
name VARCHAR(80) UNIQUE,
address VARCHAR(120) UNIQUE);
```

```
CREATE TABLE part
(part_nr CHAR(8) NOT NULL PRIMARY KEY,
description VARCHAR(30) NOT NULL);
```

```
CREATE TABLE collection_schedule
(schedule_id SMALLINT NOT NULL PRIMARY KEY,
delivery_date DATE NOT NULL,
customer_id CHAR(3) NOT NULL,
FOREIGN KEY (customer_id) REFERENCES customer (customer_id));
```

```
CREATE TABLE supply_parts
(supplier_id CHAR(5),
part_nr CHAR(8),
FOREIGN KEY (supplier_id) REFERENCES supplier (supplier_id),
FOREIGN KEY (part_nr) REFERENCES part (part_nr),
PRIMARY KEY (supplier_id, part_nr));
```

```
CREATE TABLE collect
(schedule_id SMALLINT NOT NULL,
supplier_id CHAR(5) NOT NULL,
part_nr CHAR(8) NOT NULL,
sch_quantity INT NOT NULL,
FOREIGN KEY (schedule_id) REFERENCES collection_schedule (schedule_id),
FOREIGN KEY (supplier_id) REFERENCES supplier (supplier_id),
FOREIGN KEY (part_nr) REFERENCES part (part_nr),
PRIMARY KEY (schedule_id, supplier_id, part_nr));
```

```
CREATE TABLE route
(customer_id CHAR(3) NOT NULL,
supplier_id CHAR(5) NOT NULL,
route_id CHAR(9) NOT NULL UNIQUE,
FOREIGN KEY (customer_id) REFERENCES customer (customer_id),
FOREIGN KEY (supplier_id) REFERENCES supplier (supplier_id),
PRIMARY KEY (customer_id, supplier_id));
```

```
CREATE TABLE invoice
(invoice_nr CHAR(10) NOT NULL PRIMARY KEY,
inv_date DATE,
supplier_id CHAR(5) NOT NULL,
customer_id CHAR(3) NOT NULL,
FOREIGN KEY (supplier_id) REFERENCES supplier (supplier_id),
FOREIGN KEY (customer_id) REFERENCES customer (customer_id));
```

```
CREATE TABLE SUPPLIED
(part_nr CHAR(8) NOT NULL,
invoice_nr CHAR (10) NOT NULL,
price INT,
quantity INT,
FOREIGN KEY (part_nr) REFERENCES part (part_nr),
FOREIGN KEY (invoice_nr) REFERENCES invoice (invoice_nr),
PRIMARY KEY (part_nr, invoice_nr));
```

```
CREATE TABLE cargo_bill
(cargo_bill_nr CHAR(13) NOT NULL,
date DATE,
invoice_nr CHAR(10) NOT NULL,
FOREIGN KEY (invoice_nr) REFERENCES invoice (invoice_nr),
PRIMARY KEY (cargo_bill_nr, invoice_nr));
```

```
CREATE TABLE trip
(trip_id CHAR(16) NOT NULL PRIMARY KEY,
delivery_date DATE,
```

```
date DATE,  
cargo_bill_nr CHAR (13) NOT NULL,  
FOREIGN KEY (cargo_bill_nr) REFERENCES cargo_bill(cargo_bill_nr));
```

```
CREATE TABLE vendor  
(vendor_id CHAR(3) NOT NULL PRIMARY KEY,  
name VARCHAR(30) UNIQUE,  
address VARCHAR(120),  
account_nr CHAR(10) UNIQUE);
```

```
CREATE TABLE vehicle  
(vehicle_id CHAR(2) NOT NULL PRIMARY KEY,  
registration_nr CHAR(10) NOT NULL UNIQUE,  
capacity INT,  
year INT,  
age INT,  
vendor_id CHAR(3),  
FOREIGN KEY (vendor_id) REFERENCES vendor (vendor_id));
```

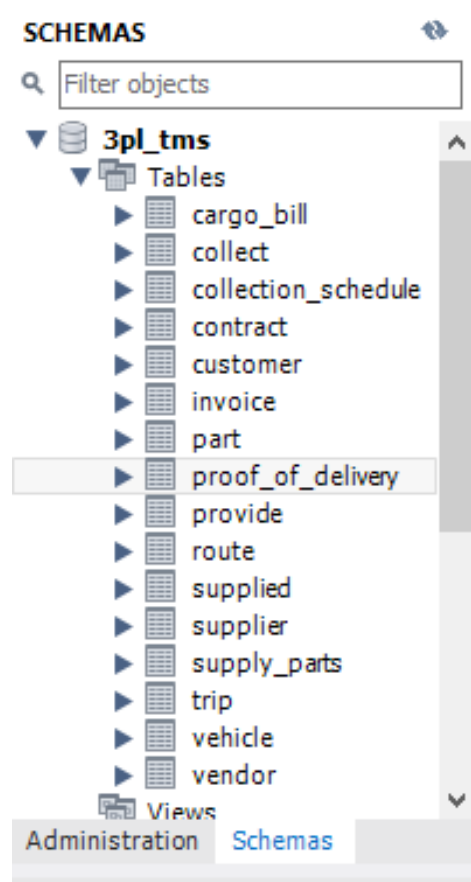
```
CREATE TABLE provide  
(trip_id CHAR (16) NOT NULL,  
vehicle_id CHAR(2) NOT NULL,  
PRIMARY KEY (trip_id, vehicle_id),  
FOREIGN KEY (trip_id) REFERENCES trip (trip_id),  
FOREIGN KEY (vehicle_id) REFERENCES vehicle (vehicle_id));
```

```
CREATE TABLE proof_of_delivery  
(pod_nr CHAR(6) NOT NULL PRIMARY KEY,  
date DATE,  
trip_id CHAR(16) NOT NULL,  
FOREIGN KEY (trip_id) REFERENCES trip (trip_id));
```

We wrote the above queries to create the tables by taking all the key constraints into consideration, to develop the schema for a third-party logistics business.

## Schema:

This is how the final schema looks like:



## Data:

We generated the data using filldb.info website. We had to generate data for each relation separately after uploading the schema on the website. We then had to select options from a drop-down menu, to enforce constraints for foreign key relations.

Sample of data generation:

info/dummy/step2/Access

base Generate Data My Projects DB Generator **New** Donate Contact 1182 sec

### 2: Fill Tables with dummy data

1. Database structure → 2. Generate data → 3. Export database

Fill Tables

table: Access

Parameters: Comma separated

randomDigit // 7

randomDigitNotNull // 5

randomNumber(\$from, \$to) // 39049

randomFloat(\$nbMaxDecimals = NULL, \$min = 0, \$max = NULL) // 48.8932

randomLetter // b

randomElement(\$arr = array('a','b','c')) // randomElement

date(\$format = 'Y-m-d', \$max = 'now') // '1979-06-09'

Then the data generated were downloaded as csv files and uploaded into the tables in the MySQL database using the data import wizard. Sample a below,

MySQL Workbench

Local Server for DMA

Table Data Import

Configure Import Settings

Detected file format: csv

Encoding: utf-8

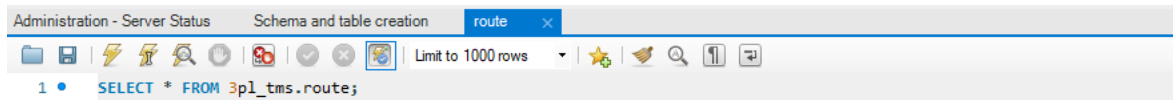
Columns:

Source Column	Dest Column
customer_id	customer_id
customer_name	customer_name
address	customer_id
poc	schedule_id
MyUnknownColumn	schedule_id

Data:

customer_id	customer_name	address	poc	MyUnknownColumn
007	Leback,H...	116 Nicklau...	Prof.Ursula...	
024	Bins, Park...	29917 Jones...	Maximilla...	
027	Ferry,Barto...	00343 Dew...	Miss Briom...	
042	Jacobs-Jac...	97065 Anto...	Reginald H...	
068	Effertz-Sch...	60486 Gray...	Miss Corthe...	

These some snapshots of the data which we imported into the tables:



Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content: [F12](#)

	customer_id	supplier_id	route_id
▶	100	10204	10010204
		10184	10184
	103	11381	10311381
	114	11381	11411381
	114	11506	11411506
	120	14023	12014023
	136	14453	13614453
	138	14748	13814748

route 2 x | Apply | Revert

Administration - Server Status | Schema and table creation | trip x

1 • SELECT \* FROM 3pl\_tms.trip;

Limit to 1000 rows | | | | |

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content: [F12](#)

	trip_id	delivery_date	date	cargo_bill_nr
▶		1999-07-29	1973-12-17	10352
1		2016-03-27	1986-02-23	1336
	10240	2020-09-15	2004-09-19	452698843
	10528101	1992-09-24	1983-05-29	9316
	106956490	2017-12-19	1973-04-29	46804921
	111261251	1990-10-04	1988-01-18	849639601
	112192908	2020-12-13	2001-12-14	325934904
	1142529	2019-07-30	2013-03-04	83402916
	14	2010-03-01	2001-03-09	13536735
	1400706	1974-05-30	1999-02-08	95
	140626966	1977-03-14	2012-05-20	6
	156747848	1974-01-27	1983-08-06	552
	16	1974-09-18	1994-10-12	2659
	1690	2011-08-28	1982-02-08	56
	17693822	2005-06-15	1975-06-27	11784299
	17850004	1994-09-25	2011-11-03	7332990

trip 1 x | Apply | Revert