



# Boring Tools

## Database Proposal

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c0757846

Database Technical Documentation Project

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# Database Design

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## Company Overview

### Company Name

Boring Tools

### Company Overview/Description

Founded in 1954 by Earlinger Vogt, Boring Tools is a family operated retail business located in beautiful Port Lambton, Ontario. Our specialty is tools that make holes and drive screws.

We pride ourselves on having staff with the highest level of technical training on all ranges of hand-held drills. If you need a small hole, a large hole, or a screw driven into in any variety of materials. We have the right tool for your hole or driving needs. Whether you are a professional or a do it yourselfer, we are confident you will find a competitively priced options in our inventory of high-quality drills.

Although we only sell drills, what we lack in item variety we make up for in personalized services including, greeting you by your first name, in-store and jobsite product demo/training, drill repairs, and direct to jobsite delivery.

### Type of Company

Retail (Brick and Mortar + online)

### Product

Hand-held Drills

### Website Resources

- [Kmstools.com](http://Kmstools.com)
- [Canucktools.ca](http://Canucktools.ca)
- [Mississaugahardware.com](http://Mississaugahardware.com)

## Product Attributes

- sku (Primary UID)
- Brand
- Model#
- Description
- Price
- Sale Price
- Photo Link
- Battery Power Type
- Chuck Size
- Cordless/Corded
- Motor Type
- Maximum Speed
- Product Weight
- Voltage
- Amps
- Colour Family
- Manufacturer Warranty
- Battery/Charger
- Features

## Customer Sales Invoice



431 John Street  
Port Lambton, ON N0P 2B0  
226-626-7202

Invoice to: Justin Corble  
521 St. Clair Parkway  
Sombra, ON N0P 2B0  
519-622-2744

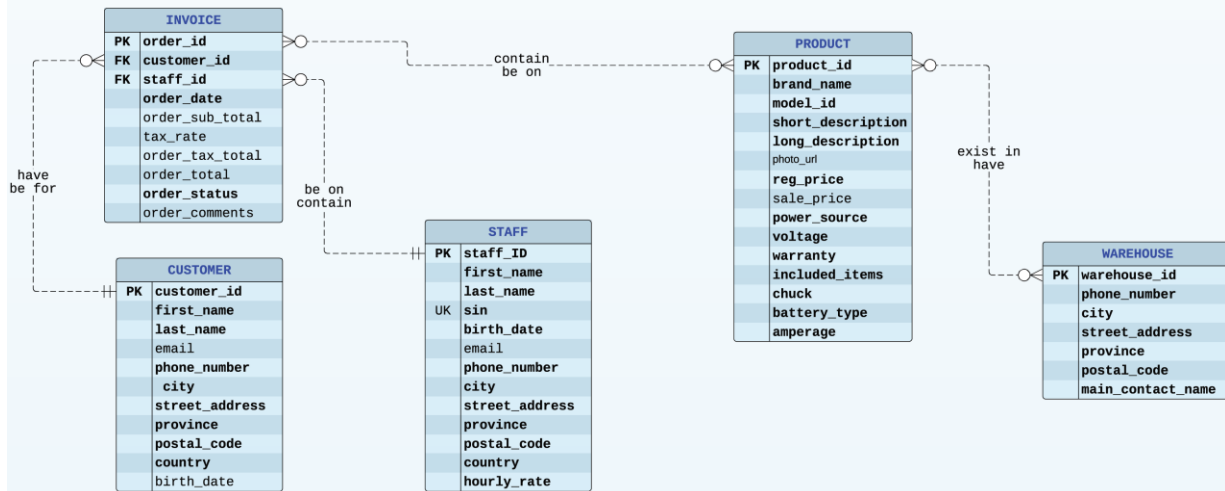
Invoice #: 027001  
Customer ID: 2003  
Date: October 31, 2020  
Staff ID: 627  
Staff Name: Scott Pilgrim

Product ID	Brand	Model	Description	Price	Qty.	Total
00275721	Dewalt	DCK240C2	Drill/Driver and Impact Driver Combo Kit - Cordless - 20 V	\$189.00	1	\$189.00
00276534	Craftsman	CMCD700C1	Cordless Electric Drill - 20V MAX	\$99.99	2	\$199.98
11975367	MAKITA	DLX21805	18V Cordless Hammer Drill and Impact Driver Set - 6 pieces	\$399.00	1	\$399.00
00276187	PORTER-CABLE	PCC620B	Cordless VSR Hammer Drill 1/2" - 20V	\$109.00	1	\$109.00
37815191	METABO HPT	DH36DMAQ2M	Metabo HPT MultiVolt Rotary Hammer - 1 9/16" - 36 V Aluminum	\$979.00	1	\$979.00
00276555	Craftsman	CMED731	Corded Drill/Driver - 7 A - 3/8" 2,500 RPM	\$79.99	2	\$159.98

Sub-Total	\$2125.96
HST	\$276.37
Invoice Total	\$2402.33

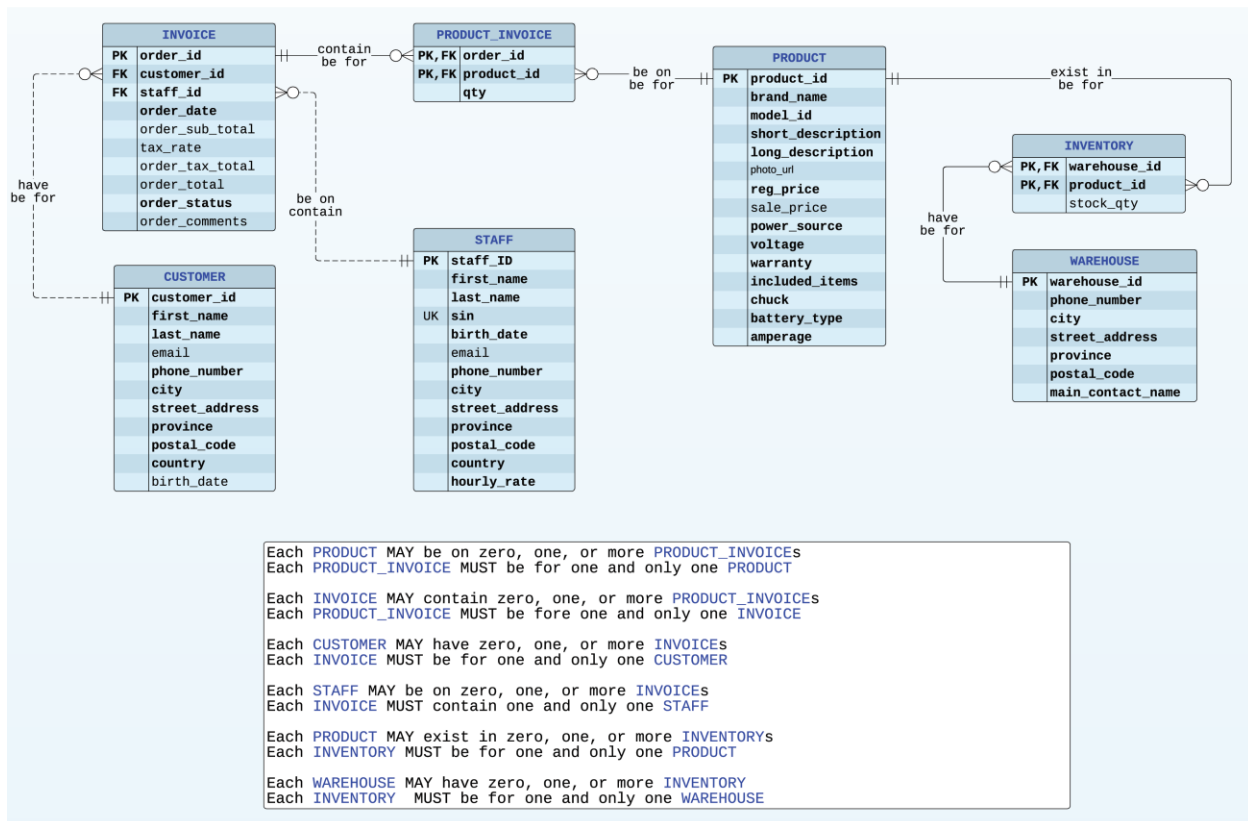
Thank you for choosing Boring Tools!

## ER Diagram (Including M:M Relationships)

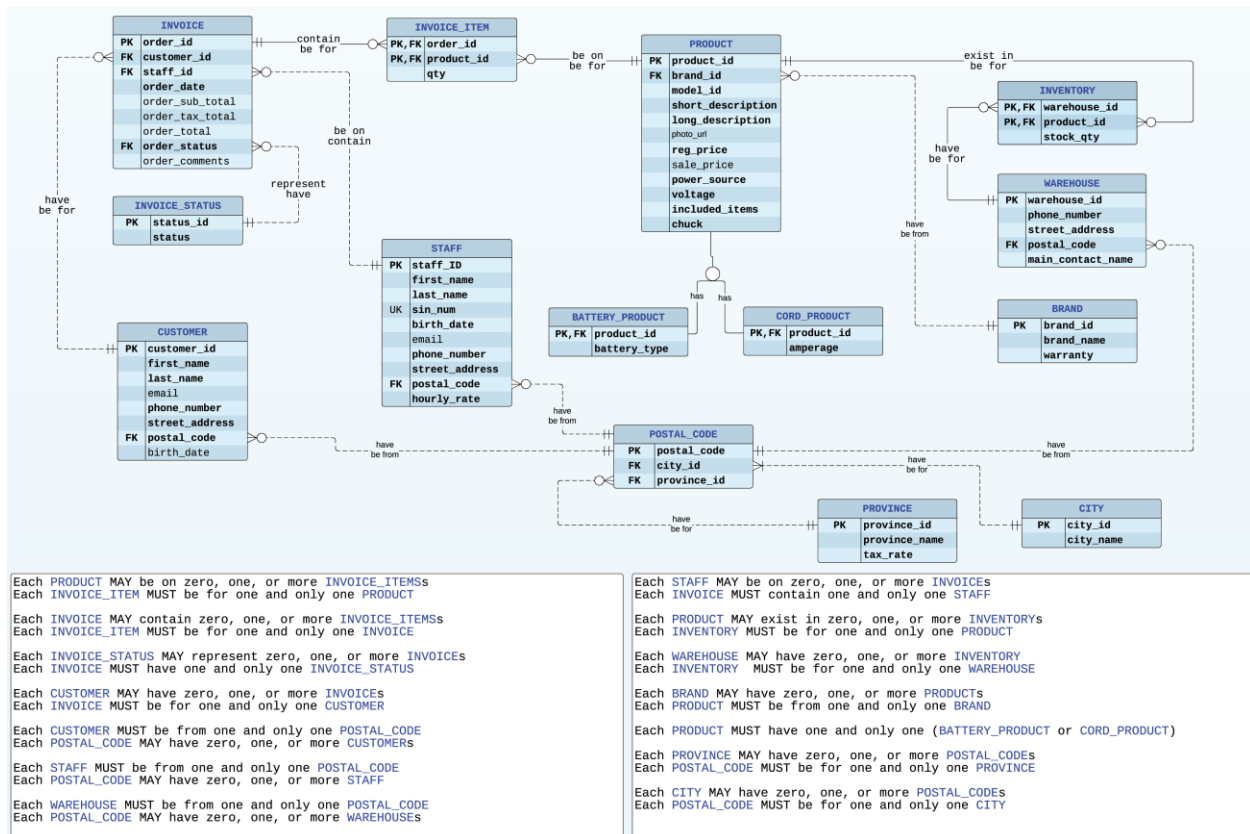


Each **PRODUCT** MAY be on zero, one, or more **INVOICES**  
 Each **INVOICE** MAY contain zero, one, or more **PRODUCTs**  
 Each **CUSTOMER** MAY have zero, one, or more **INVOICES**  
 Each **INVOICE** MUST be for one and only one **CUSTOMER**  
 Each **STAFF** MAY be on zero, one, or more **INVOICES**  
 Each **INVOICE** MUST contain one and only one **STAFF**  
 Each **PRODUCT** MAY exist in zero, one, or more **WAREHOUSEs**  
 Each **WAREHOUSE** MAY have zero, one, or more **PRODUCTs**

## ER Diagram (M:M Relationships Resolved)



## ER Diagram (3NF)





## Relational (Physical) Model

BRANDS				
Key Type	Optionality	Column Name	Data Type	Length
PK	*	brand_id	INTEGER	
UK	*	brand_name	VARCHAR	30
	*	warranty	VARCHAR	100

PRODUCTS				
Key Type	Optionality	Column Name	Data Type	Length
PK	*	product_id	INTEGER	
FK	*	brand_id	DECIMAL	3, 0
	*	model_id	VARCHAR	20
	*	short_description	VARCHAR	200
	*	long_description	VARCHAR	1800
	0	photo_url	VARCHAR	40
	*	reg_price	DECIMAL	7, 2
	0	sale_price	DECIMAL	7, 2
	*	power_source	VARCHAR	20
	*	voltage	VARCHAR	10
	*	included_items	VARCHAR	200
	*	chuck	VARCHAR	60

BATTERY_PRODUCTS				
Key Type	Optionality	Column Name	Data Type	Length
PK,FK	*	product_id	INTEGER	
	*	battery_type	VARCHAR	40

CORD_PRODUCTS				
Key Type	Optionality	Column Name	Data Type	Length
PK,FK	*	product_id	INTEGER	
	*	amperage	VARCHAR	10

CITIES				
Key Type	Optionality	Column Name	Data Type	Length
PK	*	city_id	INTEGER	
	*	city_name	VARCHAR	50

PROVINCES				
Key Type	Optionality	Column Name	Data Type	Length
PK	*	province_id	DECIMAL	2, 0
	*	province_name	VARCHAR	50
	*	tax_rate	DECIMAL	5, 3

POSTAL_CODES				
Key Type	Optionality	Column Name	Data Type	Length
PK	*	postal_code	VARCHAR	6
FK	*	city_id	INTEGER	
FK	*	province_id	DECIMAL	2, 0

STAFF				
Key Type	Optionality	Column Name	Data Type	Length
PK	*	staff_id	INTEGER	
	*	first_name	VARCHAR	30
	*	last_name	VARCHAR	30
UK	*	sin_num	DECIMAL	9
	*	birth_date	DATE	
	0	email	VARCHAR	50
	*	phone_number	VARCHAR	15
	*	street_address	VARCHAR	80
FK	*	postal_code	VARCHAR	6
	*	hourly_rate	DECIMAL	5, 2
	*	hire_date	DATE	

WAREHOUSES				
Key Type	Optionality	Column Name	Data Type	Length
PK	*	warehouse_id	INTEGER	
	*	phone_number	VARCHAR	15
	*	street_address	VARCHAR	80
FK	*	postal_code	VARCHAR	6
	*	main_contact_name	VARCHAR	60

INVENTORY				
Key Type	Optionality	Column Name	Data Type	Length
PK,FK	*	warehouse_id	INTEGER	
PK,FK	*	product_id	INTEGER	
	*	stock_qty	DECIMAL	5, 0

CUSTOMERS				
Key Type	Optionality	Column Name	Data Type	Length
PK	*	customer_id	INTEGER	
	*	first_name	VARCHAR	30
	*	last_name	VARCHAR	30
	0	email	VARCHAR	50
	*	phone_number	VARCHAR	15
	*	street_address	VARCHAR	80
FK	*	postal_code	VARCHAR	6
	0	birth_date	DATE	

INVOICE_STATUS				
Key Type	Optionality	Column Name	Data Type	Length
PK	*	status_id	DECIMAL	1, 0
	*	status	VARCHAR	20

INVOICES				
Key Type	Optionality	Column Name	Data Type	Length
PK	*	order_id	INTEGER	
FK	*	customer_id	INTEGER	
FK	*	staff_id	INTEGER	
	*	order_date	DATE	
	0	order_sub_total	DECIMAL	9, 2
	0	order_tax_total	DECIMAL	9, 2
	0	order_total	DECIMAL	9, 2
FK	*	order_status	DECIMAL	1, 0
	0	order_comments	VARCHAR	500

INVOICE_ITEMS				
Key Type	Optionality	Column Name	Data Type	Length
PK,FK	*	order_id	INTEGER	
PK,FK	*	product_id	INTEGER	
	*	qty	DECIMAL	5, 0

## Database Implementation

---

### Database Tables

Complete database implementation included in file c0757846\_TP.sql

#### Create Statements

```
CREATE TABLE bt_products (  
    product_id          INTEGER          NOT NULL ,  
    brand_id            DECIMAL (3, 0)   NOT NULL ,  
    model_id            VARCHAR (20)     NOT NULL ,  
    short_description    VARCHAR (200)    NOT NULL ,  
    long_description     VARCHAR (1800)   NOT NULL ,  
    photo_url           VARCHAR (40)      ,  
    reg_price            DECIMAL (7, 2)   NOT NULL ,  
    sale_price           DECIMAL (7, 2)   ,  
    power_source         VARCHAR (20)     NOT NULL ,  
    voltage              VARCHAR (10)     NOT NULL ,  
    included_items       VARCHAR (200)    NOT NULL ,  
    chuck                VARCHAR (60)     NOT NULL  
);
```

```
CREATE TABLE bt_battery_products (  
    product_id          INTEGER          NOT NULL ,  
    battery_type         VARCHAR (40)     NOT NULL  
);
```

```
CREATE TABLE bt_cord_products (  
    product_id          INTEGER          NOT NULL ,  
    amperage             VARCHAR (10)     NOT NULL  
);
```

```
CREATE TABLE bt_staff (  
    staff_id            INTEGER          NOT NULL ,  
    first_name          VARCHAR (30)     NOT NULL ,  
    last_name           VARCHAR (30)     NOT NULL ,  
    sin_num             DECIMAL (9)      NOT NULL ,  
    birth_date          DATE             NOT NULL ,  
    email               VARCHAR (50)     ,  
    phone_number        VARCHAR (15)     NOT NULL ,  
    street_address       VARCHAR (80)    NOT NULL ,  
    postal_code         VARCHAR (6)      NOT NULL ,  
    hourly_rate         DECIMAL (5, 2)  NOT NULL ,  
    hire_date           DATE             NOT NULL
```

```

);

CREATE TABLE bt_brands (
    brand_id          DECIMAL (3, 0) NOT NULL ,
    brand_name        VARCHAR (30)   NOT NULL ,
    warranty          VARCHAR (100)   NOT NULL
);

CREATE TABLE bt_warehouses (
    warehouse_id      INTEGER          NOT NULL ,
    phone_number       VARCHAR (15)     NOT NULL ,
    street_address     VARCHAR (80)     NOT NULL ,
    postal_code        VARCHAR (6)      NOT NULL ,
    main_contact_name  VARCHAR (60)     NOT NULL
);

CREATE TABLE bt_inventory (
    warehouse_id      INTEGER          NOT NULL ,
    product_id        INTEGER          NOT NULL ,
    stock_qty         DECIMAL (5, 0)   NOT NULL
);

CREATE TABLE bt_postal_codes (
    postal_code       VARCHAR (6)      NOT NULL ,
    city_id           INTEGER          NOT NULL ,
    province_id       DECIMAL (2, 0)   NOT NULL
);

CREATE TABLE bt_cities (
    city_id           INTEGER          NOT NULL ,
    city_name         VARCHAR (50)     NOT NULL
);

CREATE TABLE bt_provinces (
    province_id       DECIMAL (2, 0)   NOT NULL ,
    province_name     VARCHAR (50)     NOT NULL ,
    tax_rate          DECIMAL (5, 3)   NOT NULL
);

```

```

CREATE TABLE bt_customers (
    customer_id      INTEGER          NOT NULL ,
    first_name       VARCHAR (30)     NOT NULL ,
    last_name        VARCHAR (30)     NOT NULL ,
    email            VARCHAR (50)      ,
    phone_number     VARCHAR (15)     NOT NULL ,
    street_address   VARCHAR (80)     NOT NULL ,
    postal_code      VARCHAR (6)      NOT NULL ,
    birth_date       DATE
);

CREATE TABLE bt_invoices (
    order_id         INTEGER          NOT NULL ,
    customer_id      INTEGER          NOT NULL ,
    staff_id         INTEGER          NOT NULL ,
    order_date       DATE             NOT NULL ,
    order_sub_total  DECIMAL (9, 2)   ,
    order_tax_total  DECIMAL (9, 2)   ,
    order_total      DECIMAL (9, 2)   ,
    order_status     DECIMAL (1, 0)   NOT NULL ,
    order_comments   VARCHAR (500)
);

CREATE TABLE bt_invoice_items (
    order_id         INTEGER          NOT NULL ,
    product_id       INTEGER          NOT NULL ,
    qty              DECIMAL (5, 0)   NOT null
);

CREATE TABLE bt_invoice_status (
    status_id        DECIMAL (1, 0)   NOT NULL ,
    status           VARCHAR (50)     NOT NULL
);

```

## Insert Statements

One insert statement included per table. Please see c0757846\_TP.sql for complete insert statements.

```
INSERT INTO bt_brands
VALUES (100,'BLACK & DECKER','1-year limited warranty')
;
```

```
INSERT INTO bt_products
VALUES (275783,103,'DCD771C2','Cordless Compact Drill/Driver Kit - 20 V
Max','This DeWalt Cordless Compact Drill/Driver Kit has two transmission
speeds and 16 clutch settings, so it can be used for a wide range of
fastening and drilling jobs. The lightweight streamlined design of this
compact drill fits into tight spaces for ease of use. With two battery packs,
a compact charger and contractor bag included in the kit, you'll always have
power when you're on the go. It includes a 90-day money-back
guarantee.','images/00275783_L.jpg',129,NULL,'Battery','20 V','DCD771 1/2"
Drill Driver, 2 x 20 V Max Compact Lithium-Ion Battery Packs, Compact
Charger, Contractor Bag','1/2" Ratcheting Keyless')
;
```

```
INSERT INTO bt_battery_products
VALUES (27172,'18 V')
;
```

```
INSERT INTO bt_cord_products
VALUES (11975221,'6.2 A')
;
```

```
INSERT INTO bt_cities
VALUES (1,'Sarnia')
;
```

```
INSERT INTO bt_provinces
VALUES (1,'British Columbia',12)
;
```

```
INSERT INTO bt_postal_codes
VALUES ('N7T2W7',1,5)
;
```

```
INSERT INTO bt_staff
VALUES (103201,'Shawn','Vogt',132465687,'1982-04-
03','svogt@boringtools.com','226-626-7202','431 John
Street','N0P2B0',46.8,'2010-01-01')
;
```

```
INSERT INTO bt_warehouses
VALUES ('200101','416-363-4231','17 Whitaker Ave','M6J1A2','Laura Degaust')
;
```

```
INSERT INTO bt_inventory
VALUES ('200101',275783,32)
;
```

```
INSERT INTO bt_customers
VALUES (216512,'Greg','Apples','grannysmith@hotmail.com','519-344-9952','287
Brock St S','N7T2W7','1958-01-17')
;
```

```
INSERT INTO bt_invoice_status
VALUES (1, 'Pending')
;
```

```
INSERT INTO bt_invoices
VALUES (1001001,216513,103201,'2019-09-12',511.80,66.53,578.33,5,NULL)
;
```

```
INSERT INTO bt_invoice_items
VALUES (1001001,330609677,1)
;
```



## Database Constraints

### Primary Keys

```
ALTER TABLE bt_products
  ADD CONSTRAINT bt_products_pk
  PRIMARY KEY (product_id);

ALTER TABLE bt_battery_products
  ADD CONSTRAINT bt_battery_products_pk
  PRIMARY KEY (product_id);

ALTER TABLE bt_cord_products
  ADD CONSTRAINT bt_cord_products_pk
  PRIMARY KEY (product_id);

ALTER TABLE bt_staff
  ADD CONSTRAINT bt_staff_pk
  PRIMARY KEY (staff_id);

ALTER TABLE bt_brands
  ADD CONSTRAINT bt_brands_pk
  PRIMARY KEY (brand_id);

ALTER TABLE bt_warehouses
  ADD CONSTRAINT bt_warehouses_pk
  PRIMARY KEY (warehouse_id);

ALTER TABLE bt_inventory
  ADD CONSTRAINT bt_inventory_pk
  PRIMARY KEY (warehouse_id, product_id);

ALTER TABLE bt_postal_codes
  ADD CONSTRAINT bt_postal_codes_pk
  PRIMARY KEY (postal_code);

ALTER TABLE bt_cities
  ADD CONSTRAINT bt_cities_pk
  PRIMARY KEY (city_id);

ALTER TABLE bt_provinces
  ADD CONSTRAINT bt_provinces_pk
  PRIMARY KEY (province_id);

ALTER TABLE bt_customers
  ADD CONSTRAINT bt_customers_pk
  PRIMARY KEY (customer_id);
```

```
ALTER TABLE bt_invoices
  ADD CONSTRAINT bt_invoices_pk
  PRIMARY KEY (order_id);
```

```
ALTER TABLE bt_invoice_items
  ADD CONSTRAINT bt_invoice_items_pk
  PRIMARY KEY (order_id, product_id);
```

```
ALTER TABLE bt_invoice_status
  ADD CONSTRAINT bt_invoice_status
  PRIMARY KEY (status_id);
```

### Foreign Keys

```
ALTER TABLE bt_products
  ADD CONSTRAINT bt_products_brands_fk
  FOREIGN KEY (brand_id)
  REFERENCES bt_brands(brand_id);
```

```
ALTER TABLE bt_battery_products
  ADD CONSTRAINT bt_battery_products_products_fk
  FOREIGN KEY (product_id)
  REFERENCES bt_products(product_id);
```

```
ALTER TABLE bt_cord_products
  ADD CONSTRAINT bt_cord_products_products_fk
  FOREIGN KEY (product_id)
  REFERENCES bt_products(product_id);
```

```
ALTER TABLE bt_staff
  ADD CONSTRAINT bt_staff_postal_codes_fk
  FOREIGN KEY (postal_code)
  REFERENCES bt_postal_codes(postal_code);
```

```
ALTER TABLE bt_postal_codes
  ADD CONSTRAINT bt_postal_codes_cities_fk
  FOREIGN KEY (city_id)
  REFERENCES bt_cities(city_id);
```

```
ALTER TABLE bt_postal_codes
  ADD CONSTRAINT bt_postal_codes_provinces_fk
  FOREIGN KEY (province_id)
  REFERENCES bt_provinces(province_id);
```

```
ALTER TABLE bt_customers
  ADD CONSTRAINT bt_customers_postal_codes_fk
  FOREIGN KEY (postal_code)
```

```

REFERENCES bt_postal_codes(postal_code);

ALTER TABLE bt_warehouses
  ADD CONSTRAINT bt_warehouses_postal_codes_fk
  FOREIGN KEY (postal_code)
  REFERENCES bt_postal_codes(postal_code);

ALTER TABLE bt_inventory
  ADD CONSTRAINT bt_inventory_warehouses_fk
  FOREIGN KEY (warehouse_id)
  REFERENCES bt_warehouses(warehouse_id);

ALTER TABLE bt_inventory
  ADD CONSTRAINT bt_inventory_products_fk
  FOREIGN KEY (product_id)
  REFERENCES bt_products(product_id);

ALTER TABLE bt_invoices
  ADD CONSTRAINT bt_invoices_customers_fk
  FOREIGN KEY (customer_id)
  REFERENCES bt_customers(customer_id);

ALTER TABLE bt_invoices
  ADD CONSTRAINT bt_invoices_staff_fk
  FOREIGN KEY (staff_id)
  REFERENCES bt_staff(staff_id);

ALTER TABLE bt_invoices
  ADD CONSTRAINT bt_invoices_invoice_status_fk
  FOREIGN KEY (order_status)
  REFERENCES bt_invoice_status(status_id);

ALTER TABLE bt_invoice_items
  ADD CONSTRAINT bt_invoice_items_invoices_fk
  FOREIGN KEY (order_id)
  REFERENCES bt_invoices(order_id);

ALTER TABLE bt_invoice_items
  ADD CONSTRAINT bt_invoice_items_products_fk
  FOREIGN KEY (product_id)
  REFERENCES bt_products(product_id);

```

## Unique Keys

```
ALTER TABLE bt_brands
  ADD CONSTRAINT bt_brands_brand_name_uk
  UNIQUE (brand_name);
```

```
ALTER TABLE bt_staff
  ADD CONSTRAINT bt_staff_sin_num_fk
  UNIQUE (sin_num);
```

## Default Values

```
ALTER TABLE bt_products
  ALTER COLUMN sale_price
  SET DEFAULT 0;
```

```
ALTER TABLE bt_staff
  ALTER COLUMN hourly_rate
  SET DEFAULT 20;
```

```
ALTER TABLE bt_staff
  ALTER COLUMN hire_date
  SET DEFAULT CURRENT_DATE;
```

```
ALTER TABLE bt_inventory
  ALTER COLUMN stock_qty
  SET DEFAULT 0;
```

```
ALTER TABLE bt_invoices
  ALTER COLUMN order_date
  SET DEFAULT CURRENT DATE;
```

```
ALTER TABLE bt_invoices
  ALTER COLUMN order_status
  SET DEFAULT 1;
```

## Check Constraints

```
ALTER TABLE bt_products
  ADD CONSTRAINT bt_products_reg_price_ck
  CHECK (reg_price BETWEEN 0 AND 1000);
```

```
ALTER TABLE bt_products
  ADD CONSTRAINT bt_products_sale_price_ck
  CHECK (sale_price BETWEEN 0 AND 1000);
```

```
ALTER TABLE bt_provinces
  ADD CONSTRAINT bt_provinces_tax_rate_ck
  CHECK (tax_rate BETWEEN 0 AND 20);
```

```
ALTER TABLE bt_staff
  ADD CONSTRAINT bt_staff_birth_date_ck
  CHECK (birth_date < hire_date - 18 YEARS);

ALTER TABLE bt_staff
  ADD CONSTRAINT bt_staff_hourly_rate_ck
  CHECK (hourly_rate BETWEEN 14 AND 50);

ALTER TABLE bt_inventory
  ADD CONSTRAINT bt_inventory_stock_qty
  CHECK (stock_qty BETWEEN 0 AND 1000);

ALTER TABLE bt_invoices
  ADD CONSTRAINT bt_invoices_order_total_ck
  CHECK (order_total = order_sub_total + order_tax_total);

ALTER TABLE bt_invoice_items
  ADD CONSTRAINT bt_invoice_items_qty_ck
  CHECK (qty BETWEEN 0 AND 1000);
```

## Constraint Testing

```
--
=====
-- CONSTRAINT Test 1
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality of table bt_brands:
PK(brand_id) Optionality(No NULL values)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due duplicate Primary Key
value
--                      Statement 03: Insert fails due to NULL value in brand_id
column
--                      Statement 04: Insert fails due to NULL value in
brand_name column
--                      Statement 05: Insert fails due to NULL value in warranty
column
-- Action
-- Statement 1
INSERT INTO bt_brands
VALUES (110,'New Brand01','1-year limited warranty');
-- Statement 2
INSERT INTO bt_brands
VALUES (110,'New Brand02','1-year limited warranty');
-- Statement 3
INSERT INTO bt_brands
VALUES (NULL,'New Brand03','1-year limited warranty');
-- Statement 4
INSERT INTO bt_brands
VALUES (112,NULL,'1-year limited warranty');
-- Statement 5
INSERT INTO bt_brands
VALUES (113,'New Brand05',NULL);

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
--                      Statement 03: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable BRAND_ID.
--                      Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable BRAND_NAME.
--                      Statement 05: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable WARRANTY.
--
=====
```

```

-- CONSTRAINT Test 2
-- Date: November 10, 2019
-- Description: Confirm Unique Key of table bt_brands: UK(brand_name)
-- Expected Results: Statement 01: Insert executes successfully
--                     Statement 02: Insert fails due duplicate Unique Key
value
-- Action
-- Statement 1
INSERT INTO bt_brands
VALUES (114, 'New Brand06', '1-year limited warranty');
-- Statement 2
INSERT INTO bt_brands
VALUES (115, 'New Brand06', '1-year limited warrenay');

-- Actual Results: Statement 01: Insert executed successfully
--                     Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
--
=====
=====
-- CONSTRAINT Test 3
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality of table bt_products:
PK(product_id) Optionality(Only photo_url and sale_price columns can contain
NULL values)
-- Expected Results: Statement 01: Insert executes successfully
--                     Statement 02: Insert executes successfully
--                     Statement 03: Insert fails due to duplicate Primary Key
value
--                     Statement 04: Insert fails due to NULL value in
product_id column
--                     Statement 05: Insert fails due to NULL value in brand_id
column
--                     Statement 06: Insert fails due to NULL value in model_id
column
--                     Statement 07: Insert fails due to NULL value in
short_description column
--                     Statement 08: Insert fails due to NULL value in
long_description column
--                     Statement 09: Insert fails due to NULL value in
reg_price column
--                     Statement 10: Insert fails due to NULL value in
power_source column
--                     Statement 11: Insert fails due to NULL value in voltage
column

```

```

-- Statement 12: Insert fails due to NULL value in
included_items column
-- Statement 13: Insert fails due to NULL value in chuck
column
-- Action
-- Statement 1
INSERT INTO bt_products
VALUES (5,101,'DCD771C2','short description','long desription','photo
url',129,115,'Battery','20 V','included items','chuck');
-- Statement 2
INSERT INTO bt_products
VALUES (6,101,'DCD771C2','short description','long
desription',NULL,129,NULL,'Battery','20 V','included items','chuck');
-- Statement 3
INSERT INTO bt_products
VALUES (5,101,'DCD771C2','short description','long desription','photo
url',129,115,'Battery','20 V','included items','chuck');
-- Statement 4
INSERT INTO bt_products
VALUES (NULL,101,'DCD771C2','short description','long
desription',NULL,129,NULL,'Battery','20 V','included items','chuck');
-- Statement 5
INSERT INTO bt_products
VALUES (7,NULL,'DCD771C2','short description','long
desription',NULL,129,NULL,'Battery','20 V','included items','chuck');
-- Statement 6
INSERT INTO bt_products
VALUES (8,101,NULL,'short description','long
desription',NULL,129,NULL,'Battery','20 V','included items','chuck');
-- Statement 7
INSERT INTO bt_products
VALUES (9,101,'DCD771C2',NULL,'long desription',NULL,129,NULL,'Battery','20
V','included items','chuck');
-- Statement 8
INSERT INTO bt_products
VALUES (10,101,'DCD771C2','short
description',NULL,NULL,129,NULL,'Battery','20 V','included items','chuck');
-- Statement 9
INSERT INTO bt_products
VALUES (11,101,'DCD771C2','short description','long
desription',NULL,NULL,NULL,'Battery','20 V','included items','chuck');
-- Statement 10
INSERT INTO bt_products
VALUES (12,101,'DCD771C2','short description','long
desription',NULL,129,NULL,NULL,'20 V','included items','chuck');
-- Statement 11

```



```

INSERT INTO bt_products
VALUES (13,101,'DCD771C2','short description','long
description',NULL,129,NULL,'Battery',NULL,'included items','chuck');
-- Statement 12
INSERT INTO bt_products
VALUES (14,101,'DCD771C2','short description','long
description',NULL,129,NULL,'Battery','20 V',NULL,'chuck');
-- Statement 13
INSERT INTO bt_products
VALUES (15,101,'DCD771C2','short description','long
description',NULL,129,NULL,'Battery','20 V','included items',NULL);

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: Insert executed successfully
-- Statement 03: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
-- Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable PRODUCT_ID.
-- Statement 05: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable BRAND_ID.
-- Statement 06: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable MODEL_ID.
-- Statement 07: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable SHORT_DESCRIPTION.
-- Statement 08: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable LONG_DESCRIPTION.
-- Statement 09: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable REG_PRICE.
-- Statement 10: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable POWER_SOURCE.
-- Statement 11: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable VOLTAGE.
-- Statement 12: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable INCLUDED_ITEMS.
-- Statement 13: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable CHUCK.
--
=====
=====
-- CONSTRAINT Test 4
-- Date: November 10, 2019
-- Description: Confirm Foreign Key of table bt_products: FK(brand_id-
>bt_brands.brand_id)
-- Expected Results: Statement 01: Insert executes successfully
-- Statement 02: Insert fails due to Foreign Key constraint
-- Action

```

```

-- Statement 1
INSERT INTO bt_products
VALUES (17,101,'DCD771C2','short description','long desription','photo
url',129,115,'Battery','20 V','included items','chuck');
-- Statement 1
INSERT INTO bt_products
VALUES (18,115,'DCD771C2','short description','long desription','photo
url',129,115,'Battery','20 V','included items','chuck');

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_PRODUCTS_BRANDS_FK in IBM7938.
--
=====
=====
-- CONSTRAINT Test 5
-- Date: November 10, 2019
-- Description: Confirm Check Constraint bt_products_reg_price_ck: reg_price
must be between 0 and 1000
-- Expected Results: Statement 01: Insert executes successfully
-- Statement 02: Insert executes successfully
-- Statement 03: Insert executes successfully
-- Statement 04: Insert fails due to reg_price value being
less than 0
-- Statement 05: Insert fails due to reg_price value being
greater than 1000
-- Action
-- Statement 1
INSERT INTO bt_products
VALUES (19,101,'DCD771C2','short description','long desription','photo
url',500,NULL,'Battery','20 V','included items','chuck');
-- Statement 2
INSERT INTO bt_products
VALUES (20,101,'DCD771C2','short description','long desription','photo
url',0,NULL,'Battery','20 V','included items','chuck');
-- Statement 3
INSERT INTO bt_products
VALUES (21,101,'DCD771C2','short description','long desription','photo
url',1000,NULL,'Battery','20 V','included items','chuck');
-- Statement 4
INSERT INTO bt_products
VALUES (22,101,'DCD771C2','short description','long desription','photo
url',-1,NULL,'Battery','20 V','included items','chuck');
-- Statement 5
INSERT INTO bt_products

```

```

VALUES (23,101,'DCD771C2','short description','long desription','photo
url',1001,NULL,'Battery','20 V','included items','chuck');

-- Actual Results: Statement 01: Insert executed successfully
--                  Statement 02: Insert executed successfully
--                  Statement 03: Insert executed successfully
--                  Statement 04: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--                  Statement 05: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--
=====
=====
-- CONSTRAINT Test 6
-- Date: November 10, 2019
-- Description: Confirm Check Constraint bt_products_sale_price_ck:
sale_price if not NULL must be between 0 and 1000
-- Expected Results: Statement 01: Insert executes successfully
--                  Statement 02: Insert executes successfully
--                  Statement 03: Insert executes successfully
--                  Statement 04: Insert executes successfully
--                  Statement 05: Insert fails due to reg_price value being
less than 0
--                  Statement 06: Insert fails due to reg_price value being
greater than 1000
-- Action
-- Statement 1
INSERT INTO bt_products
VALUES (24,101,'DCD771C2','short description','long desription','photo
url',500,NULL,'Battery','20 V','included items','chuck');
-- Statement 1
INSERT INTO bt_products
VALUES (25,101,'DCD771C2','short description','long desription','photo
url',500,0,'Battery','20 V','included items','chuck');
-- Statement 1
INSERT INTO bt_products
VALUES (26,101,'DCD771C2','short description','long desription','photo
url',500,500,'Battery','20 V','included items','chuck');
-- Statement 1
INSERT INTO bt_products
VALUES (27,101,'DCD771C2','short description','long desription','photo
url',500,1000,'Battery','20 V','included items','chuck');
-- Statement 1
INSERT INTO bt_products
VALUES (28,101,'DCD771C2','short description','long desription','photo
url',500,-1,'Battery','20 V','included items','chuck');

```

```

-- Statement 1
INSERT INTO bt_products
VALUES (29,101,'DCD771C2','short description','long desription','photo
url',500,1001,'Battery','20 V','included items','chuck');

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: Insert executed successfully
--                      Statement 03: Insert executed successfully
--                      Statement 04: Insert executed successfully
--                      Statement 05: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--                      Statement 06: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--
=====
=====
-- CONSTRAINT Test 7
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality of table
bt_battery_products: PK(product_id), Optionality(No NULL values)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due duplicate Primary Key
value
--                      Statement 03: Insert fails due to NULL value in
product_id column
--                      Statement 04: Insert fails due to NULL value in
battery_type column
--                      Statement 05: Insert fails due to NULL value in warranty
column
-- Action
-- Statement 1
INSERT INTO bt_battery_products
VALUES (27172,'18 V');
-- Statement 2
INSERT INTO bt_battery_products
VALUES (27172,'18 V');
-- Statement 3
INSERT INTO bt_battery_products
VALUES (NULL,'18 V');
-- Statement 4
INSERT INTO bt_battery_products
VALUES (275480,NULL);

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.

```

```

--          Statement 03: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable PRODUCT_ID.
--          Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable BATTERY_TYPE.
--
=====
=====
-- CONSTRAINT Test 8
-- Date: November 10, 2019
-- Description: Confirm Foreign Key of table bt_battery_products:
FK(product_id->bt_products.product_id)
-- Expected Results: Statement 01: Insert executes successfully
--          Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_battery_products
VALUES (275606,'Lithium-ion 20V Max');
-- Statement 2
INSERT INTO bt_battery_products
VALUES (27560611,'Lithium-ion 20V Max');

-- Actual Results: Statement 01: Insert executed successfully
--          Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_BATTERY_PRODUCTS_PRODUCTS_FK in IBM7938.
--
=====
=====
-- CONSTRAINT Test 9
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality of table
bt_cord_products: PK(product_id), Optionality(No NULL values)
-- Expected Results: Statement 01: Insert executes successfully
--          Statement 02: Insert fails due duplicate Primary Key
value
--          Statement 03: Insert fails due to NULL value in
product_id column
--          Statement 04: Insert fails due to NULL value in
battery_type column
--          Statement 05: Insert fails due to NULL value in warranty
column
-- Action
-- Statement 1
INSERT INTO bt_cord_products
VALUES (11975221,'6.2 A');
-- Statement 2
INSERT INTO bt_cord_products

```

```

VALUES (11975221,'6.2 A');
-- Statement 3
INSERT INTO bt_cord_products
VALUES (NULL,'6.2 A');
-- Statement 4
INSERT INTO bt_cord_products
VALUES (27636,NULL);

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
-- Statement 03: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable PRODUCT_ID.
-- Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable AMPERAGE.
--
=====
=====
-- CONSTRAINT Test 10
-- Date: November 10, 2019
-- Description: Confirm Foreign Key of table bt_cord_products: FK(product_id-
>bt_products.product_id)
-- Expected Results: Statement 01: Insert executes successfully
-- Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_cord_products
VALUES (11975278,'6.2 A');
INSERT INTO bt_cord_products
VALUES (11975777,'6.2 A');

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_CORD_PRODUCTS_PRODUCTS_FK in IBM7938.
--
=====
=====
-- CONSTRAINT Test 11
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality of table bt_cities:
PK(city_id), Optionality(no NULL values)
-- Expected Results: Statement 01: Insert executes successfully
-- Statement 02: Insert fails due to duplicate Primary Key
-- Statement 03: Insert fails due to NULL value in city_id
column

```

```

-- Statement 04: Insert fails due to NULL value in
city_name column
-- Action
-- Statement 1
INSERT INTO bt_cities
VALUES (9,'Sherwood Park');
-- Statement 2
INSERT INTO bt_cities
VALUES (9,'Sherwood Park');
-- Statement 3
INSERT INTO bt_cities
VALUES (NULL,'Sherwood Park');
-- Statement 4
INSERT INTO bt_cities
VALUES (10,NULL);

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
-- Statement 03: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable CITY_ID.
-- Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable CITY_NAME.
--
=====
=====
-- CONSTRAINT Test 12
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality of table bt_provinces:
PK(province_id), Optionality(no NULL values)
-- Expected Results: Statement 01: Insert executes successfully
-- Statement 02: Insert fails due to duplicate Primary Key
-- Statement 03: Insert fails due to NULL value in
province_id column
-- Statement 04: Insert fails due to NULL value in
province_name column
-- Statement 05: Insert fails due to NULL value in tax_rate
column
-- Action
-- Statement 1
INSERT INTO bt_provinces
VALUES (7,'Newfoundland and Labrador',10);
-- Statement 2
INSERT INTO bt_provinces
VALUES (7,'Newfoundland and Labrador',10);
-- Statement 3

```

```

INSERT INTO bt_provinces
VALUES (NULL, 'Newfoundland and Labrador', 10);
-- Statement 4
INSERT INTO bt_provinces
VALUES (8, NULL, 10);
-- Statement 4
INSERT INTO bt_provinces
VALUES (8, 'Nova Scotia', NULL);

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
-- Statement 03: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable PROVINCE_ID.
-- Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable PROVINCE_NAME.
-- Statement 05: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable TAX_RATE.
--
=====
=====
-- CONSTRAINT Test 13
-- Date: November 10, 2019
-- Description: Confirm Check Constraint bt_provinces_tax_rate_ck: tax_rate
must be between 0 and 20
-- Expected Results: Statement 01: Insert executes successfully
-- Statement 02: Insert executes successfully
-- Statement 03: Insert executes successfully
-- Statement 04: Insert fails due to tax_rate value being
less than 0
-- Statement 05: Insert fails due to tax_rate value being
greater than 20
-- Action
-- Statement 1
INSERT INTO bt_provinces
VALUES (1, 'British Columbia', 0);
-- Statement 2
INSERT INTO bt_provinces
VALUES (2, 'Alberta', 10);
-- Statement 3
INSERT INTO bt_provinces
VALUES (3, 'Saskatchewan', 20);
-- Statement 4
INSERT INTO bt_provinces
VALUES (4, 'Manitoba', -1);
-- Statement 5

```



```

INSERT INTO bt_provinces
VALUES (5,'Ontario',21);

-- Actual Results: Statement 01: Insert executed successfully
--                  Statement 02: Insert executed successfully
--                  Statement 03: Insert executed successfully
--                  Statement 04: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--                  Statement 05: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--
=====
=====
-- CONSTRAINT Test 14
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality of table bt_postal_codes:
PK(postal_code), Optionality(no NULL values)
-- Expected Results: Statement 01: Insert executes successfully
--                  Statement 02: Insert fails due to duplicate Primary Key
--                  Statement 03: Insert fails due to NULL value in
postal_code column
--                  Statement 04: Insert fails due to NULL value in city_id
column
--                  Statement 05: Insert fails due to NULL value in
province_id column
-- Action
-- Statement 1
INSERT INTO bt_postal_codes
VALUES ('N7T2W8',1,5);
-- Statement 2
INSERT INTO bt_postal_codes
VALUES ('N7T2W8',1,5);
-- Statement 3
INSERT INTO bt_postal_codes
VALUES (NULL,1,5);
-- Statement 4
INSERT INTO bt_postal_codes
VALUES ('N7T2W9',NULL,5);
-- Statement 5
INSERT INTO bt_postal_codes
VALUES ('N7T2W6',1,NULL);

-- Actual Results: Statement 01: Insert executed successfully
--                  Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.

```

```

--          Statement 03: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable POSTAL_CODE.
--          Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable CITY_ID.
--          Statement 05: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable PROVINCE_ID.
--
=====
=====
-- CONSTRAINT Test 15
-- Date: November 10, 2019
-- Description: Confirm Foreign Key of table bt_postal_codes: FK1(city_id-
>bt_cities.city_id)
-- Expected Results: Statement 01: Insert executes successfully
--          Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_postal_codes
VALUES ('M6J1A3',8,5);
-- Statement 2
INSERT INTO bt_postal_codes
VALUES ('M6J1A4',9,5);

-- Actual Results: Statement 01: Insert executed successfully
--          Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_POSTAL_CODES_CITIES_FK in IBM7938.
--
=====
=====
-- CONSTRAINT Test 16
-- Date: November 10, 2019
-- Description: Confirm Foreign Key of table bt_postal_codes:
FK2(province_id->bt_provinces.province_id)
-- Expected Results: Statement 01: Insert executes successfully
--          Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_postal_codes
VALUES ('M6J1A5',8,5);
-- Statement 2
INSERT INTO bt_postal_codes
VALUES ('M6J1A6',8,7);

-- Actual Results: Statement 01: Insert executed successfully
--          Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_POSTAL_CODES_PROVINCES_FK in IBM7938.

```

```

--
=====
-- CONSTRAINT Test 17
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality of table bt_staff:
PK(staff_id), Optionality(Only email column can contain NULL values)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due to duplicate Primary Key
--                      Statement 03: Insert fails due to NULL value in staff_id
column
--                      Statement 04: Insert fails due to NULL value in
first_name column
--                      Statement 05: Insert fails due to NULL value in
last_name column
--                      Statement 06: Insert fails due to NULL value in sin_num
column
--                      Statement 07: Insert fails due to NULL value in
birth_date column
--                      Statement 08: Insert fails due to NULL value in
phone_number column
--                      Statement 09: Insert fails due to NULL value in
street_address column
--                      Statement 10: Insert fails due to NULL value in
postal_code column
--                      Statement 11: Insert fails due to NULL value in
hourly_rate column
--                      Statement 12: Insert fails due to NULL value in
hire_date column
-- Action
-- Statement 1
INSERT INTO bt_staff
VALUES (103204, 'Test', 'Staff', 987654321, '1982-04-03', NULL, '###-###-
####', 'Street Address', 'N0P2B0', 46.8, '2010-01-01');
-- Statement 2
INSERT INTO bt_staff
VALUES (103204, 'Test', 'Staff', 997654321, '1982-04-
03', 'email@address.ca', '###-###-####', 'Street Address', 'N0P2B0', 46.8, '2010-
01-01');
-- Statement 3
INSERT INTO bt_staff
VALUES (NULL, 'Test', 'Staff', 989654321, '1982-04-03', 'email@address.ca', '###-
###-####', 'Street Address', 'N0P2B0', 46.8, '2010-01-01');
-- Statement 4
INSERT INTO bt_staff

```

```

VALUES (103206,NULL,'Staff',987954321,'1982-04-03','email@address.ca','###-###-####','Street Address','N0P2B0',46.8,'2010-01-01');
-- Statement 5
INSERT INTO bt_staff
VALUES (103207,'Test',NULL,987694321,'1982-04-03','email@address.ca','###-###-####','Street Address','N0P2B0',46.8,'2010-01-01');
-- Statement 6
INSERT INTO bt_staff
VALUES (103208,'Test','Staff',NULL,'1982-04-03','email@address.ca','###-###-####','Street Address','N0P2B0',46.8,'2010-01-01');
-- Statement 7
INSERT INTO bt_staff
VALUES (103209,'Test','Staff',987654921,NULL,'email@address.ca','###-###-####','Street Address','N0P2B0',46.8,'2010-01-01');
-- Statement 8
INSERT INTO bt_staff
VALUES (103210,'Test','Staff',987654391,'1982-04-03','email@address.ca',NULL,'Street Address','N0P2B0',46.8,'2010-01-01');
-- Statement 9
INSERT INTO bt_staff
VALUES (103211,'Test','Staff',987654329,'1982-04-03','email@address.ca','###-###-####',NULL,'N0P2B0',46.8,'2010-01-01');
-- Statement 10
INSERT INTO bt_staff
VALUES (103212,'Test','Staff',987699321,'1982-04-03','email@address.ca','###-###-####','Street Address',NULL,46.8,'2010-01-01');
-- Statement 11
INSERT INTO bt_staff
VALUES (103213,'Test','Staff',987999321,'1982-04-03','email@address.ca','###-###-####','Street Address','N0P2B0',NULL,'2010-01-01');
-- Statement 12
INSERT INTO bt_staff
VALUES (103214,'Test','Staff',987699921,'1982-04-03','email@address.ca','###-###-####','Street Address','N0P2B0',46.8,NULL);

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23505]: [SQL0803] Duplicate key value specified.
-- Statement 03: SQL Error [23502]: [SQL0407] Null values not allowed in column or variable STAFF_ID.
-- Statement 04: SQL Error [23502]: [SQL0407] Null values not allowed in column or variable FIRST_NAME.
-- Statement 05: SQL Error [23502]: [SQL0407] Null values not allowed in column or variable LAST_NAME.

```

```

--          Statement 06: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable SIN_NUM.
--          Statement 07: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable BIRTH_DATE.
--          Statement 08: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable PHONE_NUMBER.
--          Statement 09: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable STREET_ADDRESS.
--          Statement 10: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable POSTAL_CODE.
--          Statement 11: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable HOURLY_RATE.
--          Statement 12: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable HIRE_DATE.
--
=====
=====
-- CONSTRAINT Test 18
-- Date: November 10, 2019
-- Description: Confirm Foreign Key of table bt_staff: FK(postal_code-
>bt_postal_codes.postal_code)
-- Expected Results: Statement 01: Insert executes successfully
--          Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_staff
VALUES (103205,'Test','Staff',989654321,'1982-04-
03','email@address.ca','###-###-####','Street Address','N0P2B0',46.8,'2010-
01-01');
-- Statement 2
INSERT INTO bt_staff
VALUES (103206,'Test','Staff',999654321,'1982-04-
03','email@address.ca','###-###-####','Street Address','T6M2G6',46.8,'2010-
01-01');

-- Actual Results: Statement 01: Insert executed successfully
--          Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_STAFF_POSTAL_CODES_FK in IBM7938.
--
=====
=====
-- CONSTRAINT Test 19
-- Date: November 10, 2019
-- Description: Confirm Unique Key of table bt_staff: UK(sin_num)
-- Expected Results: Statement 01: Insert executes successfully
--          Statement 02: Insert fails due to duplicate Unique Key

```

```

-- Action
-- Statement 1
INSERT INTO bt_staff
VALUES (103207, 'Test', 'Staff', 999654321, '1982-04-
03', 'email@address.ca', '###-###-####', 'Street Address', 'N0P2B0', 46.8, '2010-
01-01');
-- Statement 2
INSERT INTO bt_staff
VALUES (103208, 'Test', 'Staff', 999654321, '1982-04-
03', 'email@address.ca', '###-###-####', 'Street Address', 'N0P2B0', 46.8, '2010-
01-01');

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
--
=====
=====
-- CONSTRAINT Test 19
-- Date: November 10, 2019
-- Description: Confirm Unique Key of table bt_staff: UK(sin_num)
-- Expected Results: Statement 01: Insert executes successfully
-- Statement 02: Insert fails due to duplicate Unique Key
-- Action
-- Statement 1
INSERT INTO bt_staff
VALUES (103207, 'Test', 'Staff', 999654321, '1982-04-
03', 'email@address.ca', '###-###-####', 'Street Address', 'N0P2B0', 46.8, '2010-
01-01');
-- Statement 2
INSERT INTO bt_staff
VALUES (103208, 'Test', 'Staff', 999654321, '1982-04-
03', 'email@address.ca', '###-###-####', 'Street Address', 'N0P2B0', 46.8, '2010-
01-01');

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
--
=====
=====
-- CONSTRAINT Test 20
-- Date: November 10, 2019
-- Description: Confirm Check Constraint bt_staff_birth_date_ck: Staff
members must be 18 years of age at the time of their hire date.
-- Expected Results: Statement 01: Insert executes successfully

```

```

-- Statement 02: Insert fails due to birth_date being
greater than hire_date - 18 years
-- Action
-- Statement 1
INSERT INTO bt_staff
VALUES (103208, 'Test', 'Staff', 919654321, '1982-04-
03', 'email@address.ca', '###-###-####', 'Street Address', 'N0P2B0', 46.8, '2010-
01-01');
-- Statement 2
INSERT INTO bt_staff
VALUES (103209, 'Test', 'Staff', 919614321, '1994-04-
03', 'email@address.ca', '###-###-####', 'Street Address', 'N0P2B0', 46.8, '2010-
01-01');

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--
=====
=====
-- CONSTRAINT Test 21
-- Date: November 10, 2019
-- Description: Confirm Check Constraint bt_staff_hourly_rate_ck: hourly_rate
must be between 14 and 50.
-- Expected Results: Statement 01: Insert executes successfully
-- Statement 02: Insert executes successfully
-- Statement 03: Insert executes successfully
-- Statement 04: Insert fails due to hourly_rate being less
than 14
-- Statement 05: Insert fails due to hourly_rate being
greater than 50
-- Action
-- Statement 1
INSERT INTO bt_staff
VALUES (103209, 'Test', 'Staff', 929654321, '1982-04-
03', 'email@address.ca', '###-###-####', 'Street Address', 'N0P2B0', 14, '2010-01-
01');
-- Statement 2
INSERT INTO bt_staff
VALUES (103210, 'Test', 'Staff', 939614321, '1982-04-
03', 'email@address.ca', '###-###-####', 'Street Address', 'N0P2B0', 25, '2010-01-
01');
-- Statement 3
INSERT INTO bt_staff

```

```

VALUES (103211,'Test','Staff',939614361,'1982-04-
03','email@address.ca','###-###-####','Street Address','N0P2B0',50,'2010-01-
01');
-- Statement 4
INSERT INTO bt_staff
VALUES (103212,'Test','Staff',939644361,'1982-04-
03','email@address.ca','###-###-####','Street Address','N0P2B0',13.99,'2010-
01-01');
-- Statement 5
INSERT INTO bt_staff
VALUES (103213,'Test','Staff',939664361,'1982-04-
03','email@address.ca','###-###-####','Street Address','N0P2B0',50.01,'2010-
01-01');

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: Insert executed successfully
--                      Statement 03: Insert executed successfully
--                      Statement 04: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--                      Statement 05: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--
=====
=====
-- CONSTRAINT Test 22
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality for table bt_warehouses:
PK(warehouse_id), Optionality(no NULL values)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due to duplicate Primary Key
--                      Statement 03: Insert fails due to NULL value in
warehouse_id column
--                      Statement 04: Insert fails due to NULL value in
phone_number column
--                      Statement 05: Insert fails due to NULL value in
street_address column
--                      Statement 06: Insert fails due to NULL value in
postal_code column
--                      Statement 07: Insert fails due to NULL value in
main_contact_name
-- Action
-- Statement 1
INSERT INTO bt_warehouses
VALUES ('200105','123-456-7890','Street Address','M6J1A2','Contact Name');
-- Statement 2
INSERT INTO bt_warehouses

```



```

VALUES ('200106','123-456-7890','Street Address','M6J1A2','Contact Name');
-- Statement 3
INSERT INTO bt_warehouses
VALUES (NULL,'123-456-7890','Street Address','M6J1A2','Contact Name');
-- Statement 4
INSERT INTO bt_warehouses
VALUES ('200107',NULL,'Street Address','M6J1A2','Contact Name');
-- Statement 5
INSERT INTO bt_warehouses
VALUES ('200108','123-456-7890',NULL,'M6J1A2','Contact Name');
-- Statement 6
INSERT INTO bt_warehouses
VALUES ('200109','123-456-7890','Street Address',NULL,'Contact Name');
-- Statement 7
INSERT INTO bt_warehouses
VALUES ('200110','123-456-7890','Street Address','M6J1A2',NULL);

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
-- Statement 03: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable WAREHOUSE_ID.
-- Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable PHONE_NUMBER.
-- Statement 05: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable STREET_ADDRESS.
-- Statement 06: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable POSTAL_CODE.
-- Statement 07: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable MAIN_CONTACT_NAME.
--
=====
=====
-- CONSTRAINT Test 23
-- Date: November 10, 2019
-- Description: Confirm Foreign Key for table bt_warehouses: FK(postal_code-
>bt_postal_codes.postal_code)
-- Expected Results: Statement 01: Insert executes successfully
-- Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_warehouses
VALUES ('200111','123-456-7890','Street Address','M6J1A2','Contact Name');
-- Statement 2
INSERT INTO bt_warehouses
VALUES ('200112','123-456-7890','Street Address','T6M2G6','Contact Name');

```

```

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_WAREHOUSES_POSTAL_CODES_FK in IBM7938.
--
=====
=====
-- CONSTRAINT Test 24
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality for table bt_inventory:
PK(warehouse_id, product_id), Optionality(No NULL values)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due to duplicate Primary Key
--                      Statement 03: Insert fails due to NULL value in
warehouse_id column
--                      Statement 04: Insert fails due to NULL value in
product_id column
--                      Statement 05: Insert fails due to NULL value in
stock_qty column
-- Action
-- Statement 1
INSERT INTO bt_inventory
VALUES ('200101',275783,32);
-- Statement 2
INSERT INTO bt_inventory
VALUES ('200101',275783,32);
-- Statement 3
INSERT INTO bt_inventory
VALUES (NULL,276543,89);
-- Statement 4
INSERT INTO bt_inventory
VALUES ('200101',NULL,47);
-- Statement 5
INSERT INTO bt_inventory
VALUES ('200101',275962,NULL);

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
--                      Statement 03: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable WAREHOUSE_ID.
--                      Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable PRODUCT_ID.
--                      Statement 05: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable STOCK_QTY.

```

```

--
=====
-- CONSTRAINT Test 25
-- Date: November 10, 2019
-- Description: Confirm Foreign Key for table bt_inventory: FK1(warehouse_id->bt_warehouses.warehouse_id)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_inventory
VALUES ('200101',275962,76);
-- Statement 2
INSERT INTO bt_inventory
VALUES ('200106',19836264,7);

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_INVENTORY_WAREHOUSES_FK in IBM7938.
--
=====
-- CONSTRAINT Test 26
-- Date: November 10, 2019
-- Description: Confirm Foreign Key for table bt_inventory: FK2(product_id->bt_products.product_id)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_inventory
VALUES ('200101',19835720,82);
-- Statement 2
INSERT INTO bt_inventory
VALUES ('200101',11111,13);

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_INVENTORY_PRODUCTS_FK in IBM7938.
--
=====
-- CONSTRAINT Test 27
-- Date: November 10, 2019

```

```

-- Description: Confirm Check Constraint bt_inventory_stock_qty_ck: stock_qty
must be between 0 and 1000
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert executes successfully
--                      Statement 03: Insert executes successfully
--                      Statement 04: Insert fails due to stock_qty value being
less than 0
--                      Statement 05: Insert fails due to stock_qty value being
greater than 1000
-- Action
-- Statement 1
INSERT INTO bt_inventory
VALUES ('200101',19836155,0);
-- Statement 2
INSERT INTO bt_inventory
VALUES ('200101',275480,500);
-- Statement 3
INSERT INTO bt_inventory
VALUES ('200101',19836221,1000);
-- Statement 4
INSERT INTO bt_inventory
VALUES ('200101',275720,-1);
-- Statement 5
INSERT INTO bt_inventory
VALUES ('200101',330609707,1001);

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: Insert executed successfully
--                      Statement 03: Insert executed successfully
--                      Statement 04: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--                      Statement 05: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--
=====
=====
-- CONSTRAINT Test 28
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality for table bt_customers:
PK(customer_id), Optionality(email and birth_date can have NULL values)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due to duplicate Primary Key
--                      Statement 03: Insert fails due to NULL value in
customer_id column
--                      Statement 04: Insert fails due to NULL value in
first_name column

```

```

-- Statement 05: Insert fails due to NULL value in
last_name column
-- Statement 06: Insert executes successfully
-- Statement 07: Insert fails due to NULL value in
phone_number
-- Statement 08: Insert fails due to NULL value in
street_address column
-- Statement 09: Insert fails due to NULL value in
postal_code column
-- Statement 10: Insert executes successfully
-- Action
-- Statement 1
INSERT INTO bt_customers
VALUES (216517, 'Test', 'User', 'user@email.com', '123-456-7890', 'Street
Address', 'N7T2W7', '1958-01-17');
-- Statement 2
INSERT INTO bt_customers
VALUES (216517, 'Test', 'User', 'user@email.com', '123-456-7890', 'Street
Address', 'N7T2W7', '1958-01-17');
-- Statement 3
INSERT INTO bt_customers
VALUES (NULL, 'Test', 'User', 'user@email.com', '123-456-7890', 'Street
Address', 'N7T2W7', '1958-01-17');
-- Statement 4
INSERT INTO bt_customers
VALUES (216519, NULL, 'User', 'user@email.com', '123-456-7890', 'Street
Address', 'N7T2W7', '1958-01-17');
-- Statement 5
INSERT INTO bt_customers
VALUES (216520, 'Test', NULL, 'user@email.com', '123-456-7890', 'Street
Address', 'N7T2W7', '1958-01-17');
-- Statement 6
INSERT INTO bt_customers
VALUES (216521, 'Test', 'User', NULL, '123-456-7890', 'Street
Address', 'N7T2W7', '1958-01-17');
-- Statement 7
INSERT INTO bt_customers
VALUES (216522, 'Test', 'User', 'user@email.com', NULL, 'Street
Address', 'N7T2W7', '1958-01-17');
-- Statement 8
INSERT INTO bt_customers
VALUES (216523, 'Test', 'User', 'user@email.com', '123-456-
7890', NULL, 'N7T2W7', '1958-01-17');
-- Statement 9
INSERT INTO bt_customers

```

```

VALUES (216524,'Test','User','user@email.com','123-456-7890','Street
Address',NULL,'1958-01-17');
-- Statement 10
INSERT INTO bt_customers
VALUES (216525,'Test','User','user@email.com','123-456-7890','Street
Address','N7T2W7',NULL);

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
-- Statement 03: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable CUSTOMER_ID.
-- Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable FIRST_NAME.
-- Statement 05: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable LAST_NAME.
-- Statement 06: Insert executed successfully
-- Statement 07: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable PHONE_NUMBER.
-- Statement 08: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable STREET_ADDRESS.
-- Statement 09: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable POSTAL_CODE.
-- Statement 10: Insert executed successfully
--
=====
=====
-- CONSTRAINT Test 29
-- Date: November 10, 2019
-- Description: Confirm Foreign Key for table bt_customers: FK(postal_code-
>bt_postal_codes.postal_code)
-- Expected Results: Statement 01: Insert executes successfully
-- Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_customers
VALUES (216526,'Test','User','user@email.com','123-456-7890','Street
Address','N7T2W7','1958-01-17');
-- Statement 2
INSERT INTO bt_customers
VALUES (216527,'Test','User','user@email.com','123-456-7890','Street
Address','T6M2G6','1958-01-17');

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_CUSTOMERS_POSTAL_CODES_FK in IBM7938.

```

```

--
=====
-- CONSTRAINT Test 30
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality for table
bt_invoice_status: PK(status_id), Optionality(No NULL values)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due to duplicate Primary Key
-- Action
-- Statement 1
INSERT INTO bt_invoice_status
VALUES (6, 'Testing');
-- Statement 2
INSERT INTO bt_invoice_status
VALUES (6, 'Testing');

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
--
=====
-- CONSTRAINT Test 31
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality for table bt_invoices:
PK(order_id) Optionality(order_subtotal, order_tax_total, order_total, and
order_comments can have NULL values)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due to duplicate Primary Key
--                      Statement 03: Insert fails due to NULL value in order_id
column
--                      Statement 04: Insert fails due to NULL value in
customer_id column
--                      Statement 05: Insert fails due to NULL value in staff_id
column
--                      Statement 06: Insert fails due to NULL value in
order_date column
--                      Statement 07: Insert executes successfully with NULL
values in order_sub_total, order_tax_total, order_total, and order_comments
columns
--                      Statement 08: Insert fails due to NULL value in
order_status
-- Action
-- Statement 1
INSERT INTO bt_invoices

```

```

VALUES (1001002,216512,103203,'2019-09-12',1084.80,141.02,1225.82,5,'hold
for pickup');
-- Statement 2
INSERT INTO bt_invoices
VALUES (1001002,216512,103203,'2019-09-12',1084.80,141.02,1225.82,5,'hold
for pickup');
-- Statement 3
INSERT INTO bt_invoices
VALUES (NULL,216513,103201,'2019-09-12',511.80,66.53,578.33,5,NULL);
-- Statement 4
INSERT INTO bt_invoices
VALUES (1001003,NULL,103202,'2019-09-15',501.99,65.26,567.25,5,NULL);
-- Statement 5
INSERT INTO bt_invoices
VALUES (1001004,216513,NULL,'2019-10-01',373.40,48.54,421.94,4,NULL);
-- Statement 6
INSERT INTO bt_invoices
VALUES (1001005,216515,103201,NULL,713.10,92.70,805.80,5,NULL);
-- Statement 7
INSERT INTO bt_invoices
VALUES (1001006,216513,103203,'2019-10-07',NULL,NULL,NULL,3,NULL);
-- Statement 8
INSERT INTO bt_invoices
VALUES (1001007,216514,103203,'2019-10-15',518.00,67.34,585.34,NULL,NULL);

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
-- Statement 03: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable ORDER_ID.
-- Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable CUSTOMER_ID.
-- Statement 05: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable STAFF_ID.
-- Statement 06: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable ORDER_DATE.
-- Statement 07: Insert executed successfully
-- Statement 08: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable ORDER_STATUS.
--
=====
=====
-- CONSTRAINT Test 32
-- Date: November 10, 2019
-- Description: Confirm Foreign Key for table bt_invoices: FK1(customer_id-
>bt_customers.customer_id)

```



```

-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_invoices
VALUES (1001001,216513,103201,'2019-09-12',511.80,66.53,578.33,5,NULL);
-- Statement 2
INSERT INTO bt_invoices
VALUES (1001003,216517,103202,'2019-09-15',501.99,65.26,567.25,5,NULL);

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_INVOICES_CUSTOMERS_FK in IBM7938.
--
=====
-- CONSTRAINT Test 33
-- Date: November 10, 2019
-- Description: Confirm Foreign Key for table bt_invoices: FK2(staff_id-
>bt_staff.staff_id)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_invoices
VALUES (1001004,216513,103202,'2019-10-01',373.40,48.54,421.94,4,NULL);
-- Statement 2
INSERT INTO bt_invoices
VALUES (1001005,216515,103204,'2019-10-05',713.10,92.70,805.80,5,NULL);

-- Actual Results: Statement 01: Insert executed successfully
--                      Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_INVOICES_STAFF_FK in IBM7938.
--
=====
-- CONSTRAINT Test 34
-- Date: November 10, 2019
-- Description: Confirm Foreign Key for table bt_invoices: FK3(order_status-
>bt_invoice_status.status_id)
-- Expected Results: Statement 01: Insert executes successfully
--                      Statement 02: Insert fails due to Foreign Key constraint
-- Action
-- Statement 1
INSERT INTO bt_invoices
VALUES (1001007,216514,103203,'2019-10-15',518.00,67.34,585.34,3,NULL);

```

```

-- Statement 2
INSERT INTO bt_invoices
VALUES (1001008,216515,103202,'2019-10-20',1551.40,201.68,1753.08,6,NULL);

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23503]: [SQL0530] Operation not
allowed by referential constraint BT_INVOICES_INVOICE_STATUS_FK in IBM7938.
--
=====
=====
-- CONSTRAINT Test 35
-- Date: November 10, 2019
-- Description: Confirm Primary Key and Optionality of table invoice_items:
PK(order_id, product_id), Optionality(No NULL values)
-- Expected Results: Statement 01: Insert executes successfully
-- Statement 02: Insert fails due duplicate Primary Key
-- Statement 03: Insert fails due to NULL value in order_id
column
-- Statement 04: Insert fails due to NULL value in
product_id column
-- Statement 05: Insert fails due to NULL value in qty
column
-- Action
-- Statement 1
INSERT INTO bt_invoice_items
VALUES (1001001,330609677,1);
-- Statement 2
INSERT INTO bt_invoice_items
VALUES (1001001,330609677,1);
-- Statement 3
INSERT INTO bt_invoice_items
VALUES (NULL,275480,1);
-- Statement 4
INSERT INTO bt_invoice_items
VALUES (1001002,NULL,2);
-- Statement 5
INSERT INTO bt_invoice_items
VALUES (1001003,32165002,NULL);

-- Actual Results: Statement 01: Insert executed successfully
-- Statement 02: SQL Error [23505]: [SQL0803] Duplicate key
value specified.
-- Statement 03: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable ORDER_ID.
-- Statement 04: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable PRODUCT_ID.

```

```

--          Statement 05: SQL Error [23502]: [SQL0407] Null values not
allowed in column or variable QTY.
--
=====
=====
-- CONSTRAINT Test 36
-- Date: November 10, 2019
-- Description: Confirm Check Constraint bt_invoice_items_qty_ck: qty must be
between 0 and 1000
-- Expected Results: Statement 01: Insert executes successfully
--                   Statement 02: Insert executes successfully
--                   Statement 03: Insert executes successfully
--                   Statement 04: Insert fails due to qty being less than 0
--                   Statement 05: Insert fails due to qty being greater than
1000
-- Action
-- Statement 1
INSERT INTO bt_invoice_items
VALUES (1001003,276128,0);
-- Statement 2
INSERT INTO bt_invoice_items
VALUES (1001003,27636,500);
-- Statement 3
INSERT INTO bt_invoice_items
VALUES (1001004,330609726,1000);
-- Statement 4
INSERT INTO bt_invoice_items
VALUES (1001004,276258,-1);
-- Statement 5
INSERT INTO bt_invoice_items
VALUES (1001005,330609731,1001);

-- Actual Results: Statement 01: Insert executed successfully
--                   Statement 02: Insert executed successfully
--                   Statement 03: Insert executed successfully
--                   Statement 04: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
--                   Statement 05: SQL Error [23513]: [SQL0545] INSERT, UPDATE,
or MERGE not allowed by CHECK constraint.
=====
=====

```

## Database SQL Query

---

### SQL Query 1

```
CREATE OR replace VIEW bt_product_stock as
SELECT
product_id,
sum(stock_qty) AS stock_qty
FROM bt_inventory
GROUP BY product_id;
```

```
CREATE OR REPLACE VIEW PRODV1 AS
SELECT
p.product_id,
b.brand_name,
p.model_id,
p.short_description,
p.included_items,
s.stock_qty,
p.reg_price
FROM bt_products AS p
INNER JOIN bt_brands AS b
USING (brand_id)
INNER JOIN bt_product_stock AS s
ON p.product_id = s.product_id;
```

### SQL Query 2

```
CREATE OR replace VIEW PRODV2 AS
SELECT
c.first_name || ' ' || c.last_name AS customer_name,
TO_CHAR(i.order_date, 'mm/dd/yy') AS order_date,
i.order_id,
p.model_id,
ii.qty AS num_ordered,
DECIMAL(ROUND(ii.qty * MIN(p.reg_price, COALESCE(p.sale_price, p.reg_price)),
2),7,2) AS sub_total,
DECIMAL(ROUND(ii.qty * MIN(p.reg_price, COALESCE(p.sale_price, p.reg_price))
* pr.tax_rate/100, 2), 7, 2) AS tax_total,
DECIMAL(ROUND(ii.qty * MIN(p.reg_price, COALESCE(p.sale_price, p.reg_price))
+ ii.qty * MIN(p.reg_price, COALESCE(p.sale_price, p.reg_price)) *
pr.tax_rate/100, 2), 7, 2) AS quoted_price,
p.short_description AS description
FROM bt_invoices AS i
INNER JOIN bt_customers AS c
```

```
ON i.customer_id = c.customer_id
INNER JOIN bt_invoice_items AS ii
ON i.order_id = ii.order_id
INNER JOIN bt_products AS p
ON ii.product_id = p.product_id
INNER JOIN bt_postal_codes AS pc
USING (postal_code)
INNER JOIN bt_provinces AS pr
ON pc.province_id = pr.province_id;
```