Database Design & SQL

Term Project: Ladders

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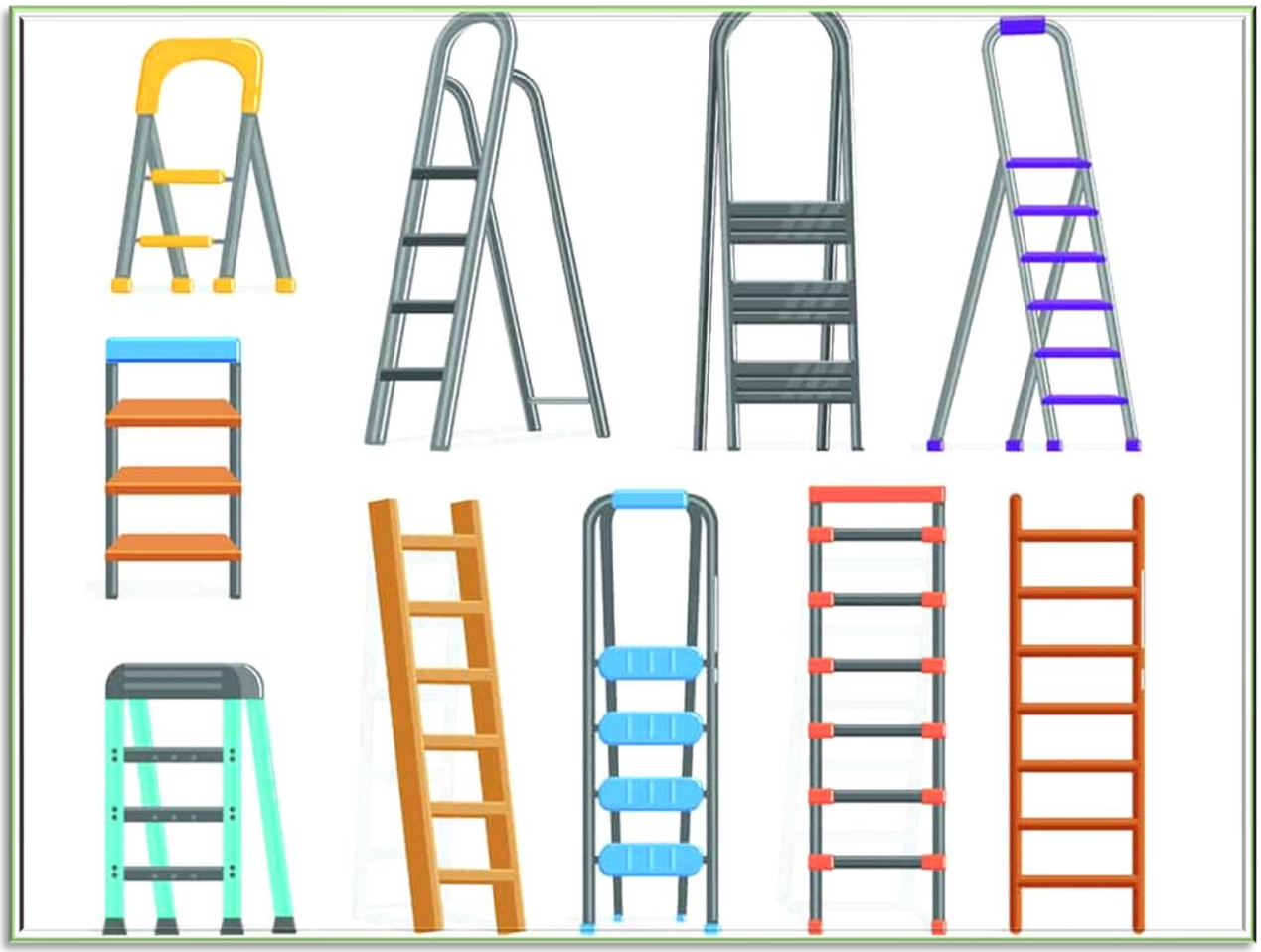


Company Description:

1.1 Company Name:

New Heights Ladder Co.

1.2 Company Overview:

New Heights Ladder Co. started out in 1978 as a small shop in northern Alberta, mainly selling to painters and storage companies. Over the years they have expanded across Canada and even into the United States with over 150 stores in total.

They became well known and a go to store for ladders as they have excellent service with a variety of stock to fit any need. This is perfectly complimented by well trained staff that has exceptional knowledge to help any customer find the perfect fit for their needs.

1.3 Product:

Ladders

1.4 Product Attributes:

Attribute	Sample
Product id	101
Brand	Metaltech
Style	Step Ladder
Material	Fiberglass
Description	Folding compact step ladder
Height	8.5’

Attribute	Sample
Max Height	14.5’
Number of Steps	14
Weight Limit	300lbs
Unit Weight	23lbs
Rating	4.3

2.1 Customer Sales Invoice:

NEW HEIGHTS LADDER CO.

1523 106 st
T5G 2R1
Edmonton, Alberta

Customer ID: 3042

Customer Name: Raymond Howely

Customer Address: 847 Exmouth st,
Sarnia, On, N7T 2J1

Order ID: 102354

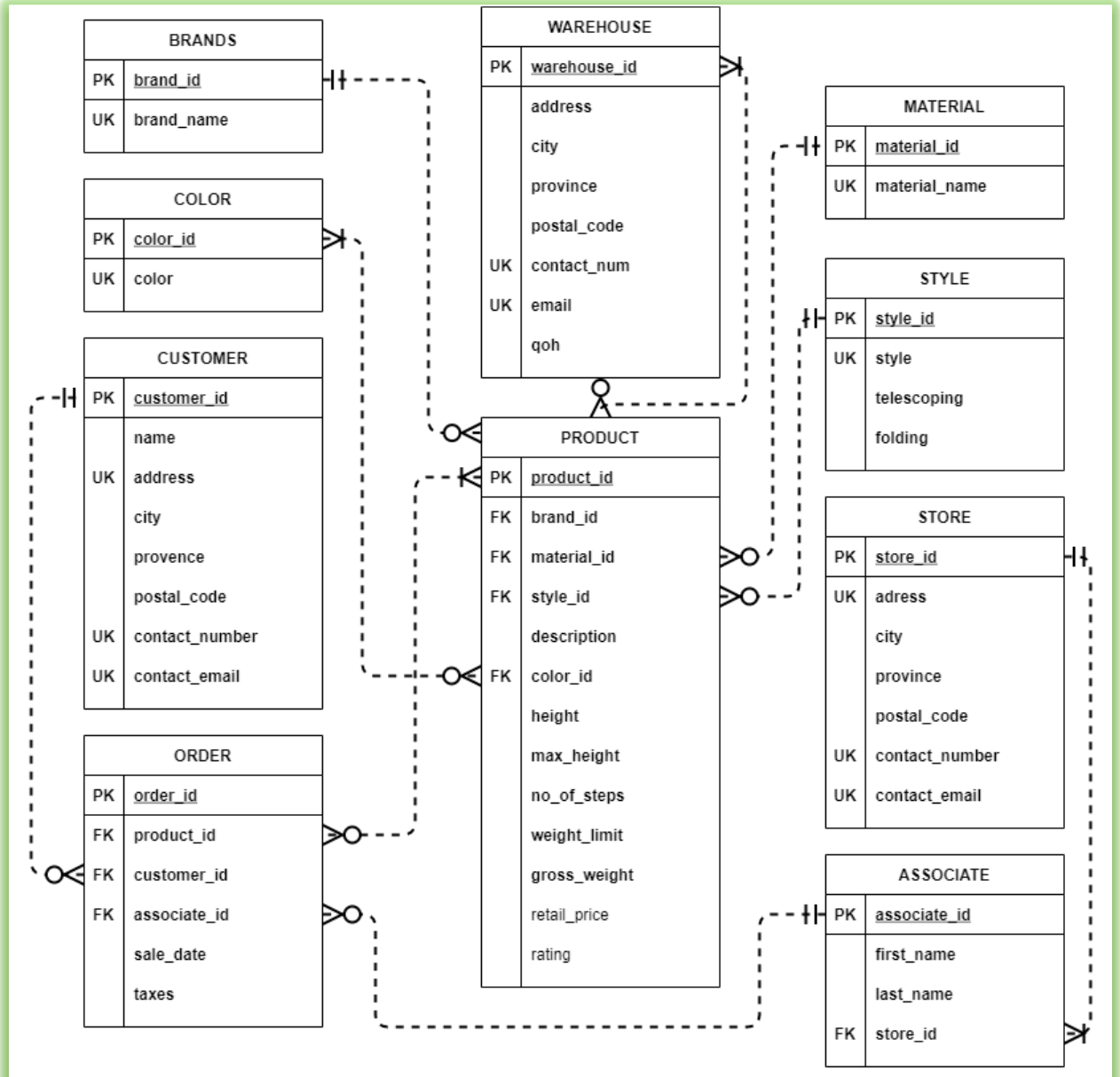
Order Date: 26/07/2019

Associate ID: 145

Associate Name: Monica Veens

Product ID	Brand	Style	Max Height	Unit Weight	Qty	Unit Price (CAD)	Extended Price
147	Werner	Step Ladder	8 ft	24lbs	2	$259.00	$518.00
101	Gorilla Ladders	Extension Ladder	24 ft	35lbs	1	$90.20	$90.20
085	Metaltech	Extension Ladder	28 ft	67lbs	4	$287.99	$1159.96
089	Metaltech	Step Ladder	6 ft	12lbs	4	$190.99	$763.96
058	Little Giant Ladder	Rope Ladder	8 ft	4lbs	2	$28.00	$56.00
						Sub-Total:	$2588.12
						Discounts:	$0.00
						Tax:	$336.45
						Invoice Total:	$2924.57

3.1 ER Diagram with Many to Many Relationships:



Each W**arehouse** may have zero or more **Product**
Each **Product** must have one or more **Warehouse**

Each **Brand** may have zero or more **Products**
Each **Product** must have one and only one **Brand**

Each **Product** must have one or more **Color**
Each **Color** may have zero or more **Product**

Each **Product** must have one and only one **Material**
Each **Material** may have zero or more **Product**

Each **Product** may have zero or more **orders**
Each **order** must have one or more **Product**

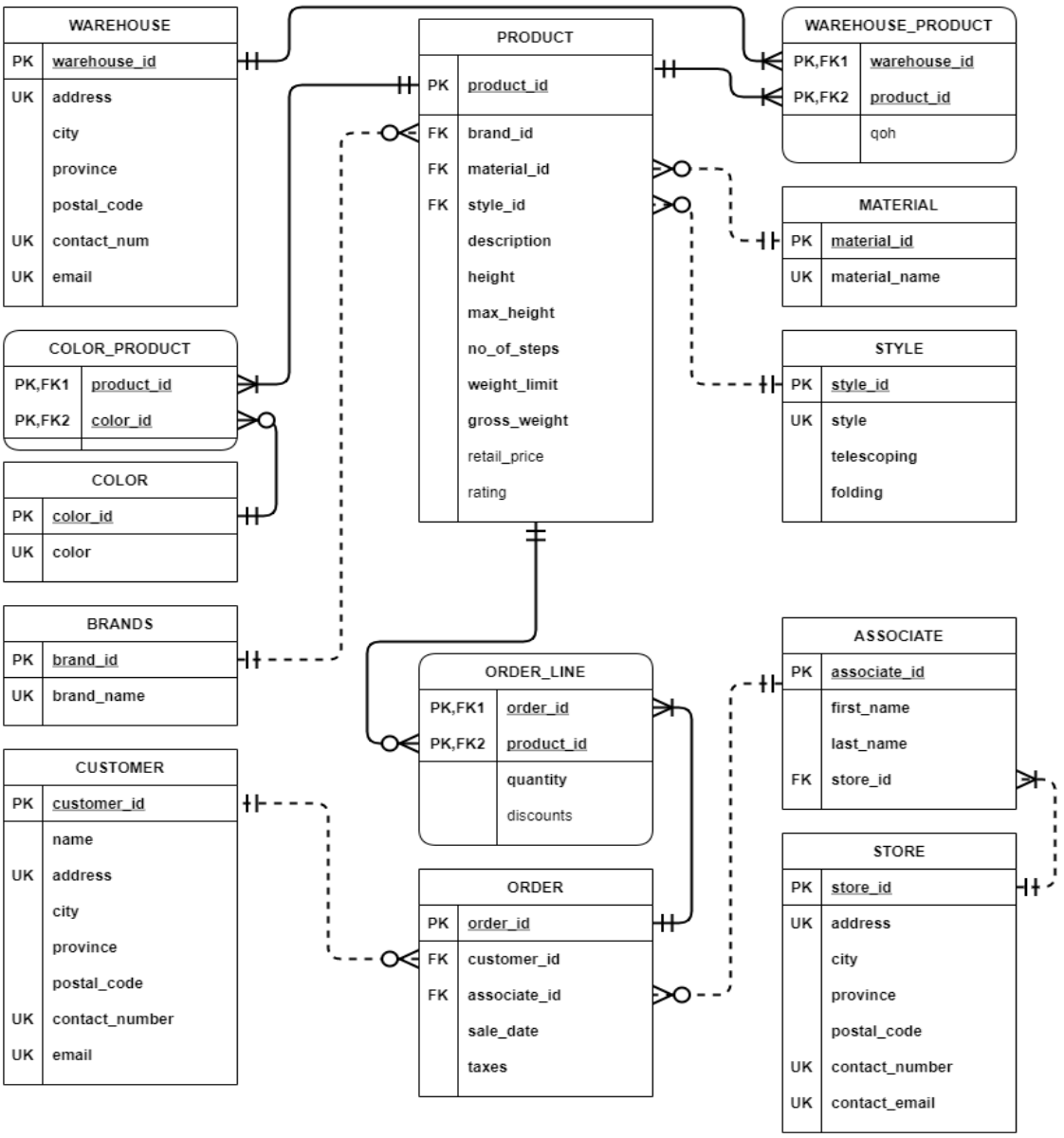
Each **Order** must have one and only one **Customer**
Each **Customer** must have one or more **Orders**

Each **Order** must have one or more **Associate**
Each **Associate** may have zero or more **Orders**

Each **Associate** must have one and only one **Store**
Each **Store** must have one or more **Associates**.

Each **Style** may have zero or more **Product**
Each **Product** must have one and only one **Style**

3.2 ER Diagram with Many to Many Relationships Resolved:



Each **Warehouse** must have one or more **Warehouse_Products**
Each **Warehouse_Product** must have one and only one **Warehouse**

Each **Warehouse_Product** must have one and only one **Product**
Each **Product** must have one or more **Warehouse_Product**

Each **Brand** my have zero or more **Product**
Each **Product** must have one and only one **Brand**

Each **Product** must have one or more **Color_Product**
Each **Color_Product** may have one and only one **Product**

Each **Color** may one zero or more **Color_Product**
Each **Color_Product** must have one and only one **Color**

Each **Product** must have one and only one **Material**
Each **Material** mayhave zero or more **Product**

Each **Product** must have one and only one **Style**
Each **Style** may have zero or more **Product**

Each **Product** may have zero or more **Order_Lines**
Each **Order_Line** must have one and only one **Product**

Each **Order_Line** must have one and only one **Order**
Each **Order** must have one or more **Order_Lines**

Each **Order** must have one and only one **Customer**
Each **Customer** may have zero or more **Orders**

Each **Order** must have one and only one **Associate**
Each **Associate** may have zero or more **Orders**

Each **Associate** must have one and only one **Store**
Each **Store** must have one or more **Associates**

4.1 Relationship Model:

PRODUCT				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK	*	product_id	INTEGER	
FK	*	brand_id	INTEGER	
FK	*	style_id	INTEGER	
FK	*	material_id	INTEGER	
	*	description	VARCHAR	200
	*	height	DECIMAL	3, 1
	*	max_height	DECIMAL	3, 1
	*	no_of_steps	DECIMAL	3, 1
	*	weight_limit	INTEGER	
	*	gross_weight	INTEGER	
	o	retail_price	DECIMAL	6, 2
	o	rating	DECIMAL	2, 1

WAREHOUSE				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK	*	warehouse_id	INTEGER	
UK	*	address	VARCHAR	30
	*	city	VARCHAR	20
	*	province	VARCHAR	2
	*	postal_code	VARCHAR	6
UK	*	contact_num	DECIMAL	10, 0
UK	*	email	VARCHAR	30

WAREHOUSE_PRODUCT				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK, FK	*	warehouse_id	INTEGER	
PK, FK	*	product_id	INTEGER	
	*	qoh	INTEGER	

MATERIAL				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK	*	material_id	INTEGER	
UK	*	material_name	VARCHAR	30

STYLE				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK	*	style_id	INTEGER	
UK	*	style_name	VARCHAR	30
	*	telescoping	BOOLEAN	
	*	folding	BOOLEAN	

BRANDS				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK	*	brand_id	INTEGER	
UK	*	brand_name	VARCHAR	30

COLOR				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK	*	color_id	INTEGER	
UK	*	color_name	VARCHAR	15

COLOR_PRODUCT				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK, FK	*	product_id	INTEGER	
PK, FK	*	color_id	INTEGER	

ORDER				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK	*	order_id	INTEGER	
FK	*	customer_id	INTEGER	
FK	*	associate_id	INTEGER	
	*	sale_date	DATE	
	*	cost	DECIMAL	6, 2
	*	taxes	DECIMAL	6, 2

ORDER_LINE				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK, FK	*	order_id	INTEGER	
PK, FK	*	product_id	INTEGER	
	*	quanity	INTEGER	
	o	discounts	DECIMAL	6, 2

CUSTOMER				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK	*	customer_id	INTEGER	
	*	name	VARCHAR	15
UK	*	address	VARCHAR	30
	*	city	VARCHAR	20
	*	province	VARCHAR	2
	*	postal_code	VARCHAR	6
UK	*	contact_number	DECIMAL	10, 0
UK	*	contact_email	VARCHAR	30

ASSOCIATE				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK	*	associate_id	INTEGER	
	*	first_name	VARCHAR	20
	*	last_name	VARCHAR	20
FK	*	store_id	INTEGER	

STORE				
Key Type	**Optionality**	**Colum Name**	**Data Type**	**Length**
PK	*	store_id	INTEGER	
UK	*	address	VARCHAR	30
	*	city	VARCHAR	20
	*	province	VARCHAR	2
	*	postal_code	VARCHAR	6
UK	*	contact_number	DECIMAL	10, 0
UK	*	contact_email	VARCHAR	30

4.2 Business Rules:

Table Name	Table Attribute	Business Rule
CUSTOMERS	customer_id	Auto-Generated
ORDERS	order_id	Auto-Generated
	sale_date	Default CURRENT_DATE
	taxes	Between 5.0 and 15.0
PRODUCTS	max_height retail_price rating	Default NULL Above 0.00 Between 0.0 and 5.0
STYLES	folding	0 or 1
	telescoping	0 or 1
WAREHOUSES **STORES** **CUSTOMER**	province	Must be “BC”, “AB”, “SK”, “MB”, “ON”, “QC”, “NB”, “NS”, “PE”, “NL”, “YT”, “NT”, “NU”
WAREHOUSES	qoh	Default 0
ORDER_LINES	discounts	Default 0