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Project name: ClimbHigh Ladders

Term: F19

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## Project 2: Data Modeling Project

### P2 Company Overview

**ClimbHigh Ladders** is a wholesale company which is established in 2019. The main aim of this company is to provide all types of ladders to customers and become global no.1 in ladders making business. We strive to make world class ladders and quality is our first priority. We sell best class ladders in mediocre price.

Our company is newly opened in Sarnia City of Canada. Currently, it does not have any branches. However, we are planning to open branches in main cities of Canada soon.

#### Type of Company

Wholesale

#### Product

Ladders

#### Website References

Featherlite Ladders - <https://featherliteladders.com/>

Home Hardware - <https://www.homehardware.ca/>

Acklands Grainger - <https://www.acklandsgrainger.com/>

## P2 Product Attributes:

- Ladder Id (PK)
- Ladder type(UID)
- Ladder name
- Ladder discount
- Ladder price
- Ladder weight
- Ladder height
- Ladder rating

## P2 Customer Sales Invoice:

### ClimbHigh Ladders

121 Main Street  
Bayside, ON N7T 3V2  
512-339-9859

Date  
September 25, 2019

To  
111 Alice Street  
Windsor, ON N8T 5V9  
219-998-7894

Ship To  
111 Alice Street  
Windsor, ON N8T 5V9  
219-998-7894

Customer ID:  
Customer Name:  
Customer Address:

Order ID:  
Order Date:  
Associate ID:  
Associate Name:

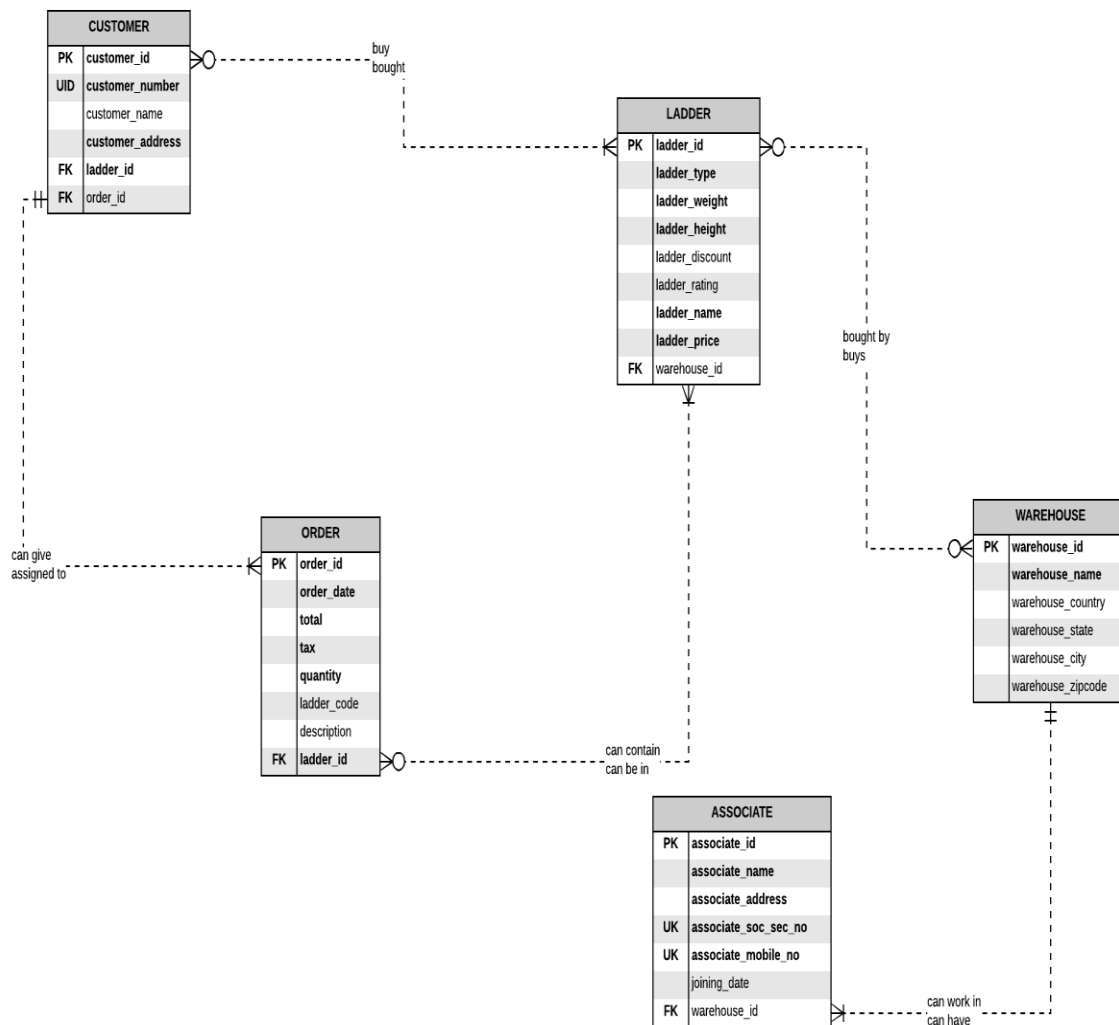
Ladder ID	Ladder Type	Ladder Brand	Ladder Description	Ladder Qty	Ladder Unit Price	Extended Price
1	Attic	ClimbHigh	Safety	1	1000	1000
2	Step	ClimbHigh	Safety	2	1000	2000
3	Orchard	ClimbHigh	Safety	1	1000	1000
					Sub Total	4000
					Tax	440
					Invoice Total	\$4,440

Tel: 040-859-449-1245

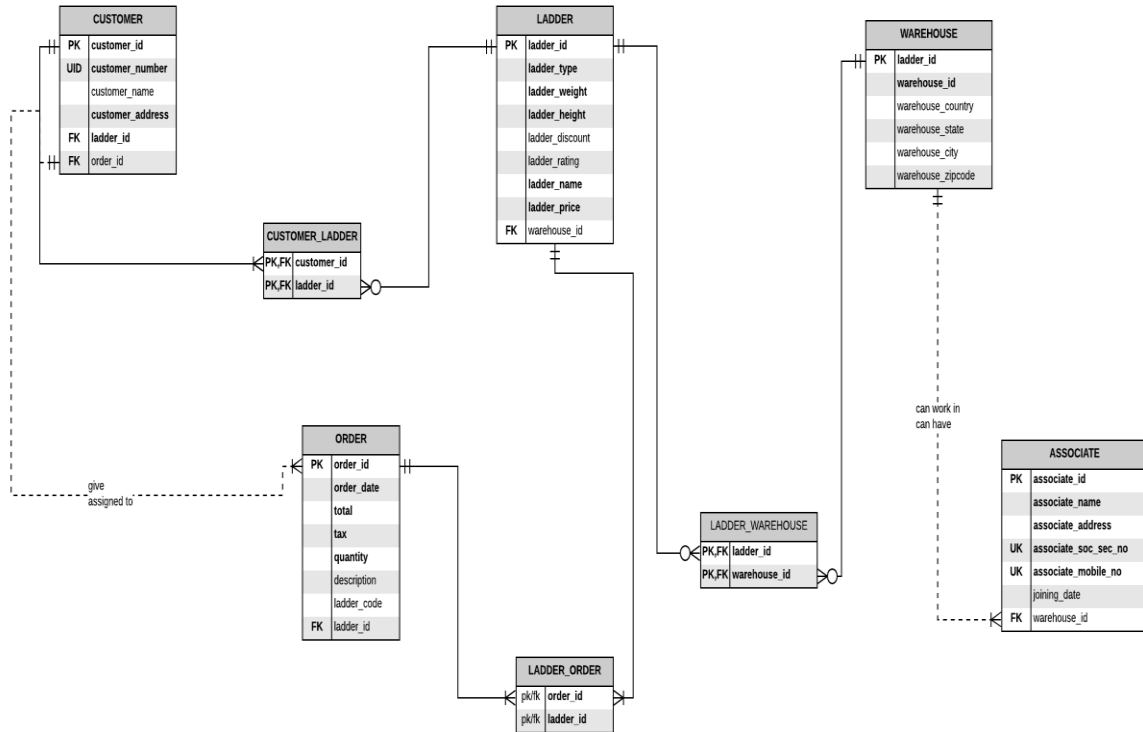
Email: Pchintala16@gmail.com

## P2 ER Diagram:

## P2 ER Diagram (Including M:M Relationships):



## P2 ER Diagram ((M:M Relationships Resolved)):



Each CUSTOMER MUST buy one or many CUSTOMER\_LADDER  
 Each CUSTOMER\_LADDER MUST have one and only CUSTOMER

Each LADDER MAY be in zero or many CUSTOMER\_LADDER  
 Each CUSTOMER\_LADDER MUST have one and only LADDER

Each CUSTOMER MUST give one or many ORDERS  
 Each ORDER MUST assigned to one and only one CUSTOMER

Each LADDER MAY be in zero or many LADDER\_WAREHOUSE  
 Each LADDER\_WAREHOUSE MUST have one and only one LADDER

Each WAREHOUSE MAY have zero or many LADDER\_WAREHOUSE  
 Each LADDER\_WAREHOUSE MUST have one and only one WAREHOUSE

## P2 Relational (Physical)Model:

CUSTOMER				
Key Type	Optionality	Column Name	Data Type	Length
pk	*	customer_id	numeric	5,0
	o	customer_number	decimal	10,0
	o	customer_name	varchar	30
	o	no_interntional_code	varchar	5
fk	o	ladder_id	numeric	5,0
fk	o	order_id	numeric	5,0

LADDER				
Key Type	Optionality	Column Name	Data Type	Length
pk	*	ladder_id	numeric	5,0
	o	ladder_type	varchar	20
	*	ladder_name	varchar	20
	o	ladder_discount	decimal	3,2
	*	ladder_price	decimal	8,2
	o	ladder_weight	decimal	5,2
	o	ladder_height	decimal	5,2
	o	ladder_rating	numeric	2,0
fk	o	warehouse_id	numeric	5,0



ORDER				
Key Type	Optionality	Column Name	Data Type	Length
pk	*	order_id	numeric	5,0
	o	order_date	date	
	o	order_total	decimal	20,2
	o	order_quantity	numeric	5,0
	o	order_tax	decimal	5,2
	o	ladder_code	varchar	30
	o	description	varchar	80
fk	o	ladder_id	numeric	5,0

WAREHOUSE				
Key Type	Optionality	Column Name	Data Type	Length
pk	*	warehouse_id	numeric	5,0
	o	warehouse_name	varchar	30
	o	warehouse_country	varchar	40
	o	warehouse_state	varchar	40
	o	warehouse_city	varchar	40
	o	warehouse_zipcode	varchar	40

CUSTOMER_LADDER				
Key Type	Optionality	Column Name	Data Type	Length
pk /fk	*	customer_id	numeric	5,0
pk/fk	*	ladder_id	numeric	5,0

LADDER_WAREHOUSE				
Key Type	Optionality	Column Name	Data Type	Length
pk /fk	*	ladder_id	numeric	5,0
pk/fk	*	warehouse_id	numeric	5,0

LADDER_ORDER				
Key Type	Optionality	Column Name	Data Type	Length
pk /fk	*	order_id	numeric	5,0
pk/fk	*	ladder_id	numeric	5,0
	o	ladder_name	varchar	20

ASSOCIATE				
Key Type	Optionality	Column Name	Data Type	Length
pk	*	associate_id	numeric	10,0
	o	associate_name	varchar	40
	o	associate_address	varchar	40
	o	associate_soc_no	numeric	10,0
	o	associate_mobile_no	numeric	10,0
	*	joining_date	date	
fk	o	warehouse_id	numeric	10,0

CUSTOMER(customer\_id,customer\_number,customer\_address,ladder\_id,order\_id)

FK ladder\_id

→ LADDER

FK order\_id →

ORDER

ORDER(order\_id,order\_date,order\_total,order\_tax,order\_quantity,ladder\_id,ladder\_code,descripiton)

FK ladder\_id → LADDER

LADDER(ladder\_id,ladder\_type,ladder\_name,ladder\_price,ladder\_discount,ladder\_height,ladder\_weight,ladder\_rating,warehouse\_id)

FK warehouse\_id → WAREHOUSE

WAREHOUSE(warehouse\_id,warehouse\_name,warehouse\_country,warehouse\_state,warehouse\_city,warehouse\_zipcode)

CUSTOMER\_LADDER(customer\_id,ladder\_id)

FK customer\_id → CUSTOMER

FK ladder\_id → LADDER

LADDER\_WAREHOUSE(ladder\_id,warehouse\_id)

FK ladder\_id → LADDER

FK warehouse\_id → WAREHOUSE

LADDER\_ORDER(ladder\_id, order\_id)

FK ladder\_id → LADDER

FK order\_id → ORDER

ASSOCIATE(associate\_id, associate\_name, associate\_address,  
associate\_soc\_sec\_no, associate\_mobile\_no, joining\_date, warehouse\_id)

FK warehouse\_id → WAREHOUSE

### P3 Database Constraints:

**Constraint Test 1:** Testing Primary key of ladder table

**Date:** November 12, 2019

**Description:** Confirm primary key constraint on ladder\_id column in ladder(product) table.

**Expected Results:** If we give same id again which is already present, then insert should fail because we are entering duplicate value which is against primary key rule.

**Action:** INSERT INTO tp\_ladder  
VALUES(5,'Orchard  
Ladder','Orchard',0,1000,12,10,5,102);

**Actual Result:** SQL Error [23505]: [SQL0803]  
Duplicate key value specified.

## **Constraint Test 2: Testing Primary key of order table**

**Date:** November 12, 2019

**Description:** Confirm primary key constraint on order\_id column in order table.

**Expected Results:** If we give same id again which is already present, then insert should fail because we are entering duplicate value which is against primary key rule.

**Action:** INSERT INTO tp\_order  
VALUES(211,'2019-10-23',1000,2,10,2);

**Actual Result:** SQL Error [23505]: [SQL0803]  
Duplicate key value specified

### **Constraint Test 3: Testing foreign key of ladder table**

**Date:** November 12, 2019

**Description:** Confirm foreign key constraint on warehouse\_id column in ladder(product) table.

**Expected Results:** If we give warehouse\_id value which is not in the table which we are created in the warehouse table then it should throw error because we are referring the warehouse\_id which is not even present in the warehouse table.

**Action:** INSERT INTO tp\_ladder

```
VALUES(5,'Orchard  
Ladder','Orchard',0,1000,12,10,5,303);
```

**Actual Result:** Operation not allowed by referential constraint TP\_LADDER\_WAREHOUSE\_ID\_FK in IBM7907.

#### **Constraint Test 4:** Testing foreign key of order table

**Date:** November 12, 2019

**Description:** Confirm foreign key constraint on ladder\_id column in order table.

**Expected Results:** If we give ladder\_id value which is not in the table which we are created in the ladder table then it should throw error because we are referring the ladder\_id which is not even present in the ladder table.

**Action:** INSERT INTO tp\_order  
VALUES(211,'2019-10-23',1000,2,10,100);

**Actual Result:** SQL Error [23503]: [SQL0530]  
Operation not allowed by referential constraint  
TP\_ORDER\_LADDER\_ID\_FK in IBM7907.



## **Constraint Test 5: Testing unique key of associate table**

**Date:** November 12, 2019

**Description:** Confirm unique key constraint on associate\_soc\_no column in associate table.

**Expected Results:** If we give associate\_soc\_no value which is already present in the table then it will throw error as unique key does not allow duplicate values.

**Action:** INSERT INTO tp\_associate  
VALUES(404,'Bharadwaj','alice  
street',12584,1234569870,'2019-1-12',101);

**Actual Result:** SQL Error [23505]: [SQL0803]  
Duplicate key value specified.

**Constraint Test 6:** Testing check key of ladder table by giving ladder\_discount column values less than 1

**Date:** November 12, 2019

**Description:** Confirm check key constraint on ladder\_discount column in ladder table by giving values which are less than 0.

**Expected Results:** If we give ladder\_discount value as -1 then it will throw error because check constraint will check whether the values are between 0 and 100

**Action:** INSERT INTO tp\_ladder  
VALUES(6,'Orchard Ladder','Orchard',  
-1,1000,12,10,5,303);

**Actual Result:** SQL Error [23513]: [SQL0545] INSERT, UPDATE, or MERGE not allowed by CHECK constraint.

**Constraint Test 7:** Testing check key of ladder table by giving ladder\_discount column values more than 100

**Date:** November 12, 2019

**Description:** Confirm check key constraint on ladder\_discount column in ladder table by giving values which are greater than 100.

**Expected Results:** If we give ladder\_discount value as 101 then it will throw error because check constraint will check whether the values are between 0 and 100

**Action:** INSERT INTO tp\_ladder  
VALUES(6,'Orchard Ladder','Orchard',  
101,1000,12,10,5,303);

**Actual Result:** SQL Error [22003]: [SQL0406]  
Conversion error on assignment to column  
LADDER\_DISCOUNT.

**Constraint Test 8:** Testing check key of ladder table by giving ladder\_rating column values more than 10

**Date:** November 12, 2019

**Description:** Confirm check key constraint on ladder\_rating column in ladder table by giving values which are greater than 10.

**Expected Results:** If we give ladder\_rating value as 11 then it will throw error because check constraint will check whether the values are between 0 and 10

**Action:** INSERT INTO tp\_ladder  
VALUES(8,'Orchard Ladder','Orchard',  
10,1000,12,10,11,303);

**Actual Result:** SQL Error [22003]: [SQL0406]  
Conversion error on assignment to column  
LADDER\_DISCOUNT.

**Constraint Test 9:** Testing check key of ladder table by giving ladder\_rating column values less than 0

**Date:** November 12, 2019

**Description:** Confirm check key constraint on ladder\_rating column in ladder table by giving values which is less than 0.

**Expected Results:** If we give ladder\_rating value as -1 then it will throw error because check constraint will check whether the values are between 0 and 10

**Action:** INSERT INTO tp\_ladder  
VALUES(8,'Orchard Ladder','Orchard',  
10,1000,12,10,-1,303);

**Actual Result:** SQL Error [22003]: [SQL0406]  
Conversion error on assignment to column  
LADDER\_DISCOUNT.

**Constraint Test 10:** Testing default key of order table

**Date:** November 12, 2019

**Description:** Confirm default key constraint on order\_date column in order table by not giving any column value.

**Expected Results:** If we not give any column value for order\_date then the query should by default should take todays date.

**Action:** INSERT INTO  
tp\_order(order\_id,order\_total,order\_quantity,order\_t  
ax,ladder\_id)  
VALUES(211,1000,2,10,2);

**Actual Result:** The data is inserted in to the table and it took todays date as default value.The value is below.Second column is the default date value.

211	2019-11-12	1000.00	2	10.00	2
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## **Constraint Test 11:** Testing default key of warehouse table

**Date:** November 12, 2019

**Description:** Confirm default key constraint on warehouse\_country column in warehouse table by not giving any column value.

**Expected Results:** If we not give any column value for warehouse\_country then the query should by default should take **Canada**.

**Action:** INSERT INTO  
tp\_warehouse(warehouse\_id,warehouse\_name,warehouse\_s  
tate,warehouse\_city,warehouse\_zipcode)  
VALUES(103,'Prashanth ClimbHigh Ladders private  
limited','Ontario','Sarnia','Q7T748');

**Actual Result:** The data is inserted in to the table and it took **Canada** as default value.

## **Constraint Test 12: Testing default key of ladder table**

**Date:** November 12, 2019

**Description:** Confirm default key constraint on ladder\_discount ,ladder\_rating columns in ladder table by not giving any column value.

**Expected Results:** If we not give any column value for ladder\_discount, ladder\_rating then the query should by default should take 5 for ladder\_discount and 10 for ladder\_rating.

**Action:** INSERT INTO  
tp\_ladder(ladder\_id,ladder\_type,ladder\_name,ladder\_p  
rice,ladder\_weight,ladder\_height,warehouse\_id)  
VALUES(11,'Safety Ladder','Safety',1000,11,15,102);

**Actual Result:** The data is inserted in to the table and it took 5 for ladder\_discount and 10 for ladder\_rating as default value.



**Constraint Test 13:** Testing primary,foreign key for intersection table of ladder and order(tp\_ladder\_order)

**Date:** November 12, 2019

**Description:** Confirm primary,foreign key constraint on intersection table of tp\_ladder\_order.

**Expected Results:** If we give any duplicate values for the combination of order\_id and ladder\_id then it should throw error.

**Action:** INSERT INTO tp\_ladder\_order  
VALUES(201,1);

**Actual Result:** SQL Error [23505]: [SQL0803]  
Duplicate key value specified.

**Constraint Test 14:** Testing primary,foreign key for intersection table of ladder and customer(tp\_customer\_ladder)

**Date:** November 12, 2019

**Description:** Confirm primary,foreign key constraint on intersection table of tp\_customer\_ladder.

**Expected Results:** If we give any duplicate values for the combination of customer\_id and ladder\_id then it should throw error.

**Action:** INSERT INTO tp\_customer\_ladder  
VALUES(301,1)

**Actual Result:** SQL Error [23505]: [SQL0803]  
Duplicate key value specified.

**Constraint Test 15:** Testing primary,foreign key for intersection table of ladder and warehouse(tp\_ladder\_warehouse)

**Date:** November 12, 2019

**Description:** Confirm primary,foreign key constraint on intersection table of tp\_ladder\_warehouse

**Expected Results:** If we give any duplicate values for the combination of warehouse\_id and ladder\_id then it should throw error.

**Action:** INSERT INTO tp\_ladder\_warehouse  
VALUES(1,101);

**Actual Result:** SQL Error [23505]: [SQL0803]  
Duplicate key value specified.