Submitted By

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EXECUTIVE SUMMARY

Business Overview:

Business: Ding's Cycle Shop is a medium scale marketplace of all things on two wheels. From low end bicycles to high end Harley Davidson motorcycles, we carry it all. From new purchasing, trade-ins, roadside assistance to repair and maintenance all customer needs are solved here.

Business Problem:

Recently, Honda and Yamaha have released a new line of electric motorcycle. Till now Ding's was providing services for mechanical and gas-powered bikes and electric vehicles, a new product category must be added to the existing data. This will require changes on the inventory, services and billing databases. All three of these are currently being maintained on a mix of paper-based file system and an outdated database.

Proposed Solution:

The addition of the electric segment to the existing catalog of products and services at Ding's requires the addition of a new product category and skill updates for workers as well. The ever-changing dynamics of a growing marketplace makes it paramount that businesses continue to improve their databases for better storage and a smoother customer experience.

Major changes:

- Redesign the data and have it available on a modern database, MySQL
- Employees
    - Training employees for new certifications
    - Adding employees with certifications

Value:

The proposed redesign of the database will improve the business efficiency and process through the following ways:

- Easier for billing

- Easier for employees to track updates
- Ease of tracking customers and their inventory
- Better data security
- Remove data redundancies
- Better data uniformity across all departments

Final thoughts and next steps:

The database redesign will help Ding's maintain a comprehensive database and keep up with the constantly evolving market dynamics. It will also improve the customer experience and, therefore, the business, by improving the billing and product catalog. As new lines of bikes, hybrid or electric and gas-powered or any new kind are introduced in the market in the future, Ding's will be able to jump in on the opportunity before its competitors and benefit from being first in the market to provide.

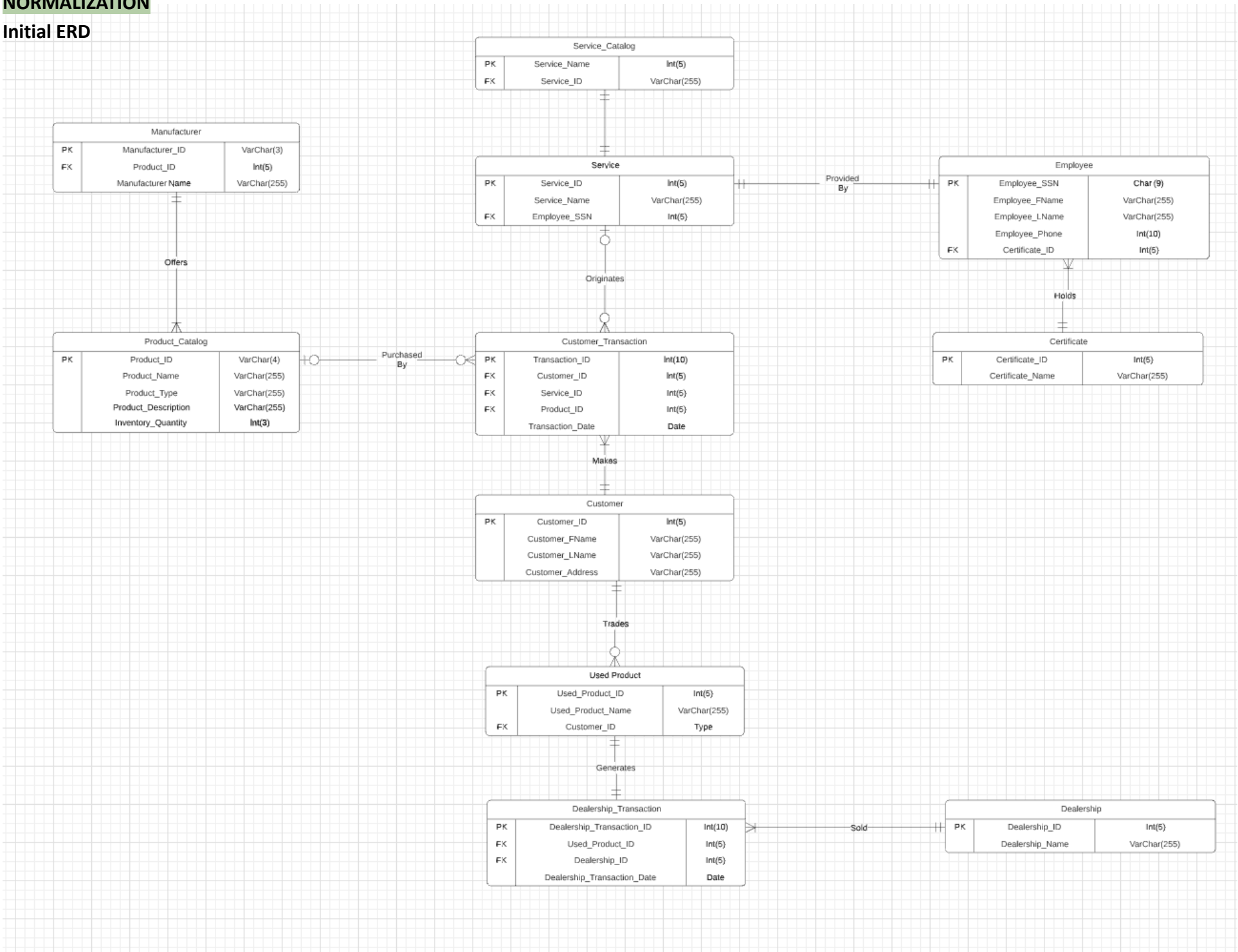
The redesign is crucial for Ding's to stay on top.

BUSINESS RULES

1. Every Manufacturer must have a Manufacturer ID (PK) and Manufacturer Name.
2. Every Product Catalog must contain Product ID (PK), Product Name, Product Type, Product Description, Inventory Quantity, and Manufacturer ID (FK).
3. Every Service must have a Service ID (PK), Service Name, and Employee SSN (FK).
4. Every Customer Transaction must have a Transaction ID (PK), Customer ID (FK), either a Service ID (FK) or Product ID (FK), and a Transaction Date.
5. Every Customer must have a Customer ID (PK), Customer FName, Customer LName, and Customer Address.
6. Every Used Product must have a Used Product ID (PK), Used Product Name, and Customer ID (FK).
7. Every Dealership Transaction must have a Dealership Transaction ID (PK), Used Product ID (FK), Dealership ID (FK), and Dealership Transaction Date.
8. Every Employee must have an Employee SSN (PK), Employee FName, Employee LName, Employee Phone number, and Certificate ID (FK).
9. Every Certificate must have a Certificate ID (PK) and Certificate Name.
10. Every Dealership must have a Dealership ID (PK) and Dealership Name.
11. A manufacturer can offer many products to the product catalog.
12. A product catalog entry is offered by only one Manufacturer.
13. A product catalog item may be requested in many customer transactions.
14. A customer transaction may request one item from the product catalog.
15. A service may be requested in many customer transactions.
16. A customer transaction may request one service.
17. A customer can make many customer transactions.
18. A customer transaction is made by only one customer.
19. A service is provided by one employee.
20. Each employee provides one service.
21. Each employee holds only one certificate.
22. Each certificate is held by at least one employee.
23. A customer may trade many used products.
24. A used product is traded by one customer.
25. A used product generates one dealership transaction.
26. A dealership transaction is generated by one used product.
27. A dealership transaction is requested by one dealership.
28. A dealership requests at least one transaction.

NORMALIZATION

Initial ERD



UNF Creation

UNF — Creation of the two-dimensional UNF; this is a single table lined up left to right

Identify all PK/FK

Highlight repeating blocks

Entity	Manufacturer	
Attributes	[PK] Manufacturer_ID	Manufacturer Name
Datatype	Char (5)	VarChar (255)
	NSP01	Nimbus
	SC002	Schwinn
	RF003	Radio Flyer

Product_Catalog						
[PK] Product_ID	[FK] Manufacturer_ID	Product_Name	Product_Type	Product_Description	Wheels	Inventory_Quantity
Char (5)	Char (5)	VarChar (255)	VarChar (255)	Var Char (255)	INT	INT
P001	NSP01	Alpha	Cycle	self powered	1	8
P002	NSP01	Seafoam	Cycle	self powered	2	5
P003	NSP01	Cruz	Cycle	self powered	3	12
P004	SC002	Classic Red	Motor	gas powered	2	5
P005	SC002	Hemiway	Motor	gas powered	2	9
P006	SC002	Bob	Cycle	self powered	1	4
P007	SC002	Lunicycle	Motor	Electric powered	2	7
P008	RF003	Aventon	Motor	Electric powered	2	1
P009	RF003	Mars	Motor	Electric powered	3	8
P010	RF003	Jupiter	Motor	Electric powered	3	3

Customer_Transaction				
[PK] Transaction_ID	[FK] Customer_ID	[FK] Service_ID	[FK] Product_ID	Transaction_Date
Char(8)	Char(5)	Char(5)	Char(5)	Date
T8883684	C1009	NULL	P002	23-Nov-2021
T8883330	C1009	S0001	NULL	26-Nov-2021
T8883118	C1025	NULL	P002	19-Oct-2021
T8881117	C1025	NULL	P004	5-Nov-2021
T8881945	C1029	NULL	P005	8-Oct-2021
T8882755	C1033	S0001	NULL	12-Oct-2021
T8883438	C1038	NULL	P005	7-Oct-2021
T8882870	C1015	NULL	P002	13-Nov-2021
T8883583	C1048	NULL	P004	26-Nov-2021
T8881728	C1051	NULL	P0005	30-Oct-2021
T8882642	C1051	S0005	NULL	5-Nov-2021
T8883930	C1051	S0006	NULL	6-Nov-2021
T8883940	C1057	S0001	NULL	8-Oct-2021
T8881349	C1064	S0005	NULL	12-Oct-2021

Service		
[PK] Service_ID	Service_Name	[FK] Employee_SSN
Char(5)	VarChar(255)	Char(9)
S0001	Tire Repair	186048520
S0002	Seat Repair	709385042
S0003	Brake Pad	405096132
S0004	Oil Change	402953160
S0005	Electrical Diagnostic	494385964
S0006	Chain Repair	618553302
S0003	Brake Pad	494720018
S0002	Seat Repair	355505462
S0005	Electrical Diagnostic	258358306
S0001	Tire Repair	960516474

Employee				
[PK] Employee_SSN	Employee_Fname	Employee_Lname	Employee_Phone	[FK] Certificate_ID
Char(9)	VarChar(255)	VarChar(255)	Char(10)	Char(5)
494385964	Albert	Simonson	2149056313	ETS55
494720018	Jose	Mendosa	2144908830	BR549
355505462	Melinda	Oberman	8168836071	ST187
258358306	Gabriel	Jackson	8169190531	ETS55
709385042	Nick	Law	9728083162	ST187
186048520	Roger	Quentin	9726669052	TRP10
960516474	Guy	Tyler	9729932160	TRP10
405096132	Sylvester	Underhill	2149305607	BR549
402953160	Maria	White	9728309641	OIL54
618553302	Yolanda	Powell	9729039160	CH559

Certificate	
[PK] Certification_ID	Certification_Name
Char(5)	VarChar(255)
ETS55	Electrical
CH559	Chains
ST187	Seats
BR549	Breaks
OIL54	Oil Changes
TRP10	Tires

Customer			
[PK] Cutomer_ID	Customer_Fname	Customer_Lname	Customer_Address
Char(5)	VarChar(255)	VarChar(255)	VarChar(255)
C1009	Odetta	Newton	316 E Sheen Avenue
C1025	Ed	Wolff	1761 Coyote Circle
C1029	Trent	Malone	724 4th Highway
C1033	Roland	Yoder	4160 Jade Street
C1038	Abe	Farley	125 Edinburgh Drive
C1015	Penelope	Homewood	5433 Wallasey Road
C1048	Kenny	Eaton	637 Spruce Street
C1051	Samuel	Richard	3858 Cold Springs Road
C1057	Martha	Schneider	464 Colony Drive
C1064	Herb	Banks	9252 Barnes Avenue

Used Product		
[PK] Used_Product_ID	Used_Product_Name	[FK] Customer_ID
Char(5)	VarChar(255)	Char(5)
P5053	Road Show	C1029
P5492	Seafoam	C1051
P5331	Tervane Mountain Bik	C1015
P5537	Cruz	C1057
P5421	Ridgeland Hybrid Bike	C1029
P5312	Pueblo	C1025
P5379	Lunicycle	C1048
P5874	RadRover Step	C1048
P5069	Mars	C1029
P5286	Green Machine	C1048

Dealership_Transaction			
[PK] Dealership_Transaction_ID	[FK] Used_Product_ID	[FK] Dealership_ID	Dealership_Transaction_Date
Char(6)	Char(5)	Char(5)	Date
DT2156	P5053	D1112	12-Nov-2021
DT2143	P5492	D1239	7-Nov-2021
DT2281	P5331	D1542	12-Nov-2021
DT2421	P5537	D1455	1-Dec-2021
DT2342	P5421	D1362	5-Nov-2021
DT2531	P5312	D1112	27-Nov-2021
DT2292	P5379	D1112	19-Nov-2021
DT2125	P5874	D1239	11-Nov-2021
DT2497	P5069	D1239	22-Nov-2021
DT2119	P5286	D1239	25-Nov-2021

Dealership	
[PK] Dealership_ID	Dealership_Name
Char(5)	VarChar(255)
D1112	Dylan's Used Bikes 101
D1239	Troy Bicycle Lot
D1542	Bikes A2Z
D1455	JR's TexasDirect
D1362	Jimmy's Used Bikes

1NF

1NF
All repeating blocks have been removed
: Add Product Detail Entity to remove repeating block related to type, description and wheels from Product_Catalog Table
: Change [FK] in Service Entity from Employee SSN to Certification_ID
--> This allows for Certificates to be linked directly to the Service Table
--> This also removes the Emoloyee Table from relationship with Service Table

Certificate	
[PK] Certification_ID	Certification_Name
ETS55	Electrical
CH559	Chains
ST187	Seats
BR549	Breaks
OIL54	Oil Changes
TRP10	Tires

Service		
[PK] Service_ID	Service_Name	[FK] Certification_ID
S0001	Tire Repair	TRP10
S0002	Seat Repair	ST187
S0003	Brake Pad	BR549
S0004	Oil Change	OIL54
S0005	Electrical Diagnostic	ETS55
S0006	Chain Repair	CH559

Employee				
[PK] Employee_SSN	Employee_Fname	Employee_Lname	Employee_Phone	[FK] Certificate_ID
494385964	Albert	Simonson	2149056313	ETS55
494720018	Jose	Mendosa	2144908830	BR549
355505462	Melinda	Oberman	8168836071	ST187
258358306	Gabriel	Jackson	8169190531	ETS55
709385042	Nick	Law	9728083162	ST187
186048520	Roger	Quentin	9726669052	TRP10
960516474	Guy	Tyler	9729932160	TRP10
405096132	Sylvester	Underhill	2149305607	BR549
402953160	Maria	White	9728309641	OIL54
618553302	Yolanda	Powell	9729039160	CH559

Manufacturer	
[PK] Manufacturer_ID	Manufacturer Name
NSP01	Nimbus
SC002	Schwinn
RF003	Radio Flyer

Product_Catalog				
[PK] Product_ID	[FK] Manufacturer_ID	Product_Name	[FK] Product_Detail	Inventory_Quantity
P001	NSP01	Alpha	A	8
P002	NSP01	Seafoam	B	5
P003	NSP01	Cruz	C	12
P004	SC002	Classic Red	D	5
P005	SC002	Hemiway	D	9
P006	SC002	Bob	A	4
P007	SC002	Lunicycle	E	7
P008	RF003	Aventon	E	1
P009	RF003	Mars	F	8
P010	RF003	Jupiter	F	3

Customer_Transaction				
[PK] Transaction_ID	[FK] Customer_ID	[FK] Service_ID	[FK] Product_ID	Transaction_Date
T8883684	C1009	NULL	P002	23-Nov-2021
T8883330	C1009	S0001	NULL	26-Nov-2021
T8883118	C1025	NULL	P002	19-Oct-2021
T8881117	C1025	NULL	P004	5-Nov-2021
T8881945	C1029	NULL	P005	8-Oct-2021
T8882755	C1033	S0001	NULL	12-Oct-2021
T8883438	C1038	NULL	P005	7-Oct-2021
T8882870	C1015	NULL	P002	13-Nov-2021
T8883583	C1048	NULL	P004	26-Nov-2021
T8881728	C1051	NULL	P0005	30-Oct-2021
T8882642	C1051	S0005	NULL	5-Nov-2021
T8883930	C1051	S0006	NULL	6-Nov-2021
T8883940	C1057	S0001	NULL	8-Oct-2021
T8881349	C1064	S0005	NULL	12-Oct-2021

Product Details			
[PK] Product_Detail	Product_Type	Product_Description	Wheels
A	Cycle	self powered	1
B	Cycle	self powered	2
C	Cycle	self powered	3
D	Motor	gas powered	2
E	Motor	Electric powered	2
F	Motor	Electric powered	3

Customer			
[PK] Cutomer_ID	Customer_Fname	Customer_Lname	Customer_Address
C1009	Odetta	Newton	316 E Sheen Avenue
C1025	Ed	Wolff	1761 Coyote Circle
C1029	Trent	Malone	724 4th Highway
C1033	Roland	Yoder	4160 Jade Street
C1038	Abe	Farley	125 Edinburgh Drive
C1015	Penelope	Homewood	5433 Wallasey Road
C1048	Kenny	Eaton	637 Spruce Street
C1051	Samuel	Richard	3858 Cold Springs Road
C1057	Martha	Schneider	464 Colony Drive
C1064	Herb	Banks	9252 Barnes Avenue

Used Product		
[PK] Used_Product_ID	Used_Product_Name	[FK] Customer_ID
P5053	Road Show	C1029
P5492	Seafoam	C1051
P5331	Tervane Mountain Bike	C1015
P5537	Cruz	C1057
P5421	Ridgeland Hybrid Bike	C1029
P5312	Pueblo	C1025
P5379	Lunicycle	C1048
P5874	RadRover Step	C1048
P5069	Mars	C1029
P5286	Green Machine	C1048

Dealership_Transaction			
[PK] Dealership_Transaction_ID	[FK] Used_Product_ID	[FK] Dealership_ID	Dealership_Transaction_Date
DT2156	P5053	D1112	12-Nov-2021
DT2143	P5492	D1239	7-Nov-2021
DT2281	P5331	D1542	12-Nov-2021
DT2421	P5537	D1455	1-Dec-2021
DT2342	P5421	D1362	5-Nov-2021
DT2531	P5312	D1112	27-Nov-2021
DT2292	P5379	D1112	19-Nov-2021
DT2125	P5874	D1239	11-Nov-2021
DT2497	P5069	D1239	22-Nov-2021
DT2119	P5286	D1239	25-Nov-2021

Dealership	
[PK] Dealership_ID	Dealership_Name
D1112	Dylan's Used Bikes 101
D1239	Troy Bicycle Lot
D1542	Bikes A2Z
D1455	JR's TexasDirect
D1362	Jimmy's Used Bikes

2NF

2NF

No CPK Exist, 1NF = 2NF

Certificate	
[PK] Certification_ID	Certification_Name
ETS55	Electrical
CH559	Chains
ST187	Seats
BR549	Breaks
OIL54	Oil Changes
TRP10	Tires

Service		
[PK] Service_ID	Service_Name	[FK] Certification_ID
S0001	Tire Repair	TRP10
S0002	Seat Repair	ST187
S0003	Brake Pad	BR549
S0004	Oil Change	OIL54
S0005	Electrical Diagnostic	ETS55
S0006	Chain Repair	CH559

Employee				
[PK] Employee_SSN	Employee_Fname	Employee_Lname	Employee_Phone	[FK] Certificate_ID
494385964	Albert	Simonson	2149056313	ETS55
494720018	Jose	Mendoza	2144908830	BR549
355505462	Melinda	Oberman	8168836071	ST187
258358306	Gabriel	Jackson	8169190531	ETS55
709385042	Nick	Law	9728083162	ST187
186048520	Roger	Quentin	9726669052	TRP10
960516474	Guy	Tyler	9729932160	TRP10
405096132	Sylvester	Underhill	2149305607	BR549
402953160	Maria	White	9728309641	OIL54
618553302	Yolanda	Powell	9729039160	CH559

Manufacturer	
[PK] Manufacturer_ID	Manufacturer Name
NSP01	Nimbus
SC002	Schwinn
RF003	Radio Flyer

Customer_Transaction				
[PK] Transaction_ID	[FK] Customer_ID	[FK] Service_ID	[FK] Product_ID	Transaction_Date
T8883684	C1009	NULL	P002	23-Nov-2021
T8883330	C1009	S0001	NULL	26-Nov-2021
T8883118	C1025	NULL	P002	19-Oct-2021
T8881117	C1025	NULL	P004	5-Nov-2021
T8881945	C1029	NULL	P005	8-Oct-2021
T8882755	C1033	S0001	NULL	12-Oct-2021
T8883438	C1038	NULL	P005	7-Oct-2021
T8882870	C1015	NULL	P002	13-Nov-2021
T8883583	C1048	NULL	P004	26-Nov-2021
T8881728	C1051	NULL	P0005	30-Oct-2021
T8882642	C1051	S0005	NULL	5-Nov-2021
T8883930	C1051	S0006	NULL	6-Nov-2021
T8883940	C1057	S0001	NULL	8-Oct-2021
T8881349	C1064	S0005	NULL	12-Oct-2021

Product_Catalog				
[PK] Product_ID	[FK] Manufacturer_ID	Product_Name	[FK] Product_Detail	Inventory_Quantity
P001	NSP01	Alpha	A	8
P002	NSP01	Seafoam	B	5
P003	NSP01	Cruz	C	12
P004	SC002	Classic Red	D	5
P005	SC002	Hemiway	D	9
P006	SC002	Bob	A	4
P007	SC002	Lunicycle	E	7
P008	RF003	Aventon	E	1
P009	RF003	Mars	F	8
P010	RF003	Jupiter	F	3

Customer			
[PK] Cutomer_ID	Customer_Fname	Customer_Lname	Customer_Address
C1009	Odetta	Newton	316 E Sheen Avenue
C1025	Ed	Wolff	1761 Coyote Circle
C1029	Trent	Malone	724 4th Highway
C1033	Roland	Yoder	4160 Jade Street
C1038	Abe	Farley	125 Edinburgh Drive
C1015	Penelope	Homewood	5433 Wallasey Road
C1048	Kenny	Eaton	637 Spruce Street
C1051	Samuel	Richard	3858 Cold Springs Road
C1057	Martha	Schneider	464 Colony Drive
C1064	Herb	Banks	9252 Barnes Avenue

Product Details			
[PK] Product_Detail	Product_Type	Product_Description	Wheels
A	Cycle	self powered	1
B	Cycle	self powered	2
C	Cycle	self powered	3
D	Motor	gas powered	2
E	Motor	Electric powered	2
F	Motor	Electric powered	3

Used Product		
[PK] Used_Product_ID	Used_Product_Name	[FK] Customer_ID
P5053	Road Show	C1029
P5492	Seafoam	C1051
P5331	Tervane Mountain Bike	C1015
P5537	Cruz	C1057
P5421	Ridgeland Hybrid Bike	C1029
P5312	Pueblo	C1025
P5379	Lunicycle	C1048
P5874	RadRover Step	C1048
P5069	Mars	C1029
P5286	Green Machine	C1048

Dealership_Transaction			
[PK] Dealership_Transaction_ID	[FK] Used_Product_ID	[FK] Dealership_ID	Dealership_Transaction_Date
DT2156	P5053	D1112	12-Nov-2021
DT2143	P5492	D1239	7-Nov-2021
DT2281	P5331	D1542	12-Nov-2021
DT2421	P5537	D1455	1-Dec-2021
DT2342	P5421	D1362	5-Nov-2021
DT2531	P5312	D1112	27-Nov-2021
DT2292	P5379	D1112	19-Nov-2021
DT2125	P5874	D1239	11-Nov-2021
DT2497	P5069	D1239	22-Nov-2021
DT2119	P5286	D1239	25-Nov-2021

Dealership	
[PK] Dealership_ID	Dealership_Name
D1112	Dylan's Used Bikes 101
D1239	Troy Bicycle Lot
D1542	Bikes A2Z
D1455	JR's TexasDirect
D1362	Jimmy's Used Bikes

3NF

3NF

No transitive dependencies. 2NF = 3NF

Certificate	
[PK] Certification_ID	Certification_Name
ETS55	Electrical
CH559	Chains
ST187	Seats
BR549	Breaks
OIL54	Oil Changes
TRP10	Tires

Service		
[PK] Service_ID	Service_Name	[FK] Certification_ID
S0001	Tire Repair	TRP10
S0002	Seat Repair	ST187
S0003	Brake Pad	BR549
S0004	Oil Change	OIL54
S0005	Electrical Diagnostic	ETS55
S0006	Chain Repair	CH559

Employee				
[PK] Employee_SSN	Employee_Fname	Employee_Lname	Employee_Phone	[FK] Certificate_ID
494385964	Albert	Simonson	2149056313	ETS55
494720018	Jose	Mendosa	2144908830	BR549
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258358306	Gabriel	Jackson	8169190531	ETS55
709385042	Nick	Law	9728083162	ST187
186048520	Roger	Quentin	9726669052	TRP10
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405096132	Sylvester	Underhill	2149305607	BR549
402953160	Maria	White	9728309641	OIL54
618553302	Yolanda	Powell	9729039160	CH559

Manufacturer	
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Product_Catalog				
[PK] Product_ID	[FK] Manufacturer_ID	Product_Name	[FK] Product_Detail	Inventory_Quantity
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P004	SC002	Classic Red	D	5
P005	SC002	Hemiway	D	9
P006	SC002	Bob	A	4
P007	SC002	Lunicycle	E	7
P008	RF003	Aventon	E	1
P009	RF003	Mars	F	8
P010	RF003	Jupiter	F	3

Customer			
[PK] Cutomer_ID	Customer_Fname	Customer_Lname	Customer_Address
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C1025	Ed	Wolff	1761 Coyote Circle
C1029	Trent	Malone	724 4th Highway
C1033	Roland	Yoder	4160 Jade Street
C1038	Abe	Farley	125 Edinburgh Drive
C1015	Penelope	Homewood	5433 Wallasey Road
C1048	Kenny	Eaton	637 Spruce Street
C1051	Samuel	Richard	3858 Cold Springs Road
C1057	Martha	Schneider	464 Colony Drive
C1064	Herb	Banks	9252 Barnes Avenue

Product Details			
[PK] Product_Detail	Product_Type	Product_Description	Wheels
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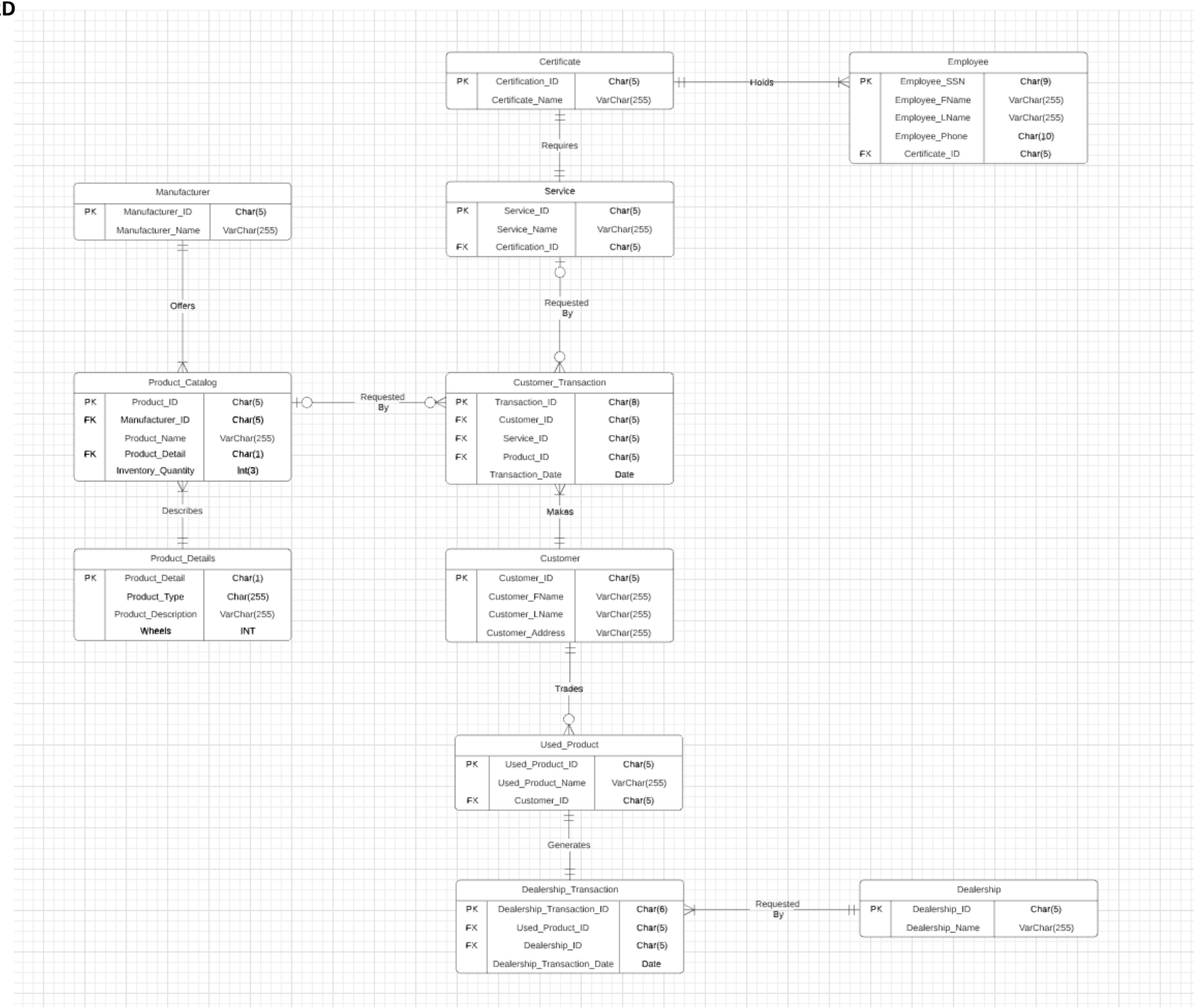
D	Motor	gas powered	2
E	Motor	Electric powered	2
F	Motor	Electric powered	3

Used Product		
[PK] Used_Product_ID	Used_Product_Name	[FK] Customer_ID
P5053	Road Show	C1029
P5492	Seafoam	C1051
P5331	Tervane Mountain Bike	C1015
P5537	Cruz	C1057
P5421	Ridgeland Hybrid Bike	C1029
P5312	Pueblo	C1025
P5379	Lunicycle	C1048
P5874	RadRover Step	C1048
P5069	Mars	C1029
P5286	Green Machine	C1048

Dealership_Transaction			
[PK] Dealership_Transaction_ID	[FK] Used_Product_ID	[FK] Dealership_ID	Dealership_Transaction_Date
DT2156	P5053	D1112	12-Nov-2021
DT2143	P5492	D1239	7-Nov-2021
DT2281	P5331	D1542	12-Nov-2021
DT2421	P5537	D1455	1-Dec-2021
DT2342	P5421	D1362	5-Nov-2021
DT2531	P5312	D1112	27-Nov-2021
DT2292	P5379	D1112	19-Nov-2021
DT2125	P5874	D1239	11-Nov-2021
DT2497	P5069	D1239	22-Nov-2021
DT2119	P5286	D1239	25-Nov-2021

Dealership	
[PK] Dealership_ID	Dealership_Name
D1112	Dylan's Used Bikes 101
D1239	Troy Bicycle Lot
D1542	Bikes A2Z
D1455	JR's TexasDirect
D1362	Jimmy's Used Bikes

Final ERD


Certificate
PK Certification_ID Char(5)
Certificate_Name VarChar(255)
Holds
Employee
PK Employee_SSN Char(9)
Employee_FName VarChar(255)
Employee_LName VarChar(255)
Employee_Phone Char(10)
FK Certificate_ID Char(5)
Requires
Manufacturer
PK Manufacturer_ID Char(5)
Manufacturer_Name VarChar(255)
Service
PK Service_ID Char(5)
Service_Name VarChar(255)
FK Certification_ID Char(5)
Offers
Requested By
Product_Catalog
PK Product_ID Char(5)
FK Manufacturer_ID Char(5)
Product_Name VarChar(255)
FK Product_Detail Char(1)
Inventory_Quantity Int(3)
Requested By
Customer_Transaction
PK Transaction_ID Char(8)
FK Customer_ID Char(5)
FK Service_ID Char(5)
FK Product_ID Char(5)
Transaction_Date Date
Describes
Makes
Product_Details
PK Product_Detail Char(1)
Product_Type Char(255)
Product_Description VarChar(255)
Wheels INT
Customer
PK Customer_ID Char(5)
Customer_FName VarChar(255)
Customer_LName VarChar(255)
Customer_Address VarChar(255)
Trades
Used_Product
PK Used_Product_ID Char(5)
Used_Product_Name VarChar(255)
FK Customer_ID Char(5)
Generates
Dealership_Transaction
PK Dealership_Transaction_ID Char(6)
FK Used_Product_ID Char(5)
FK Dealership_ID Char(5)
Dealership_Transaction_Date Date
Requested By
Dealership
PK Dealership_ID Char(5)
Dealership_Name VarChar(255)

DATABASE CREATION

1. **Create Database**

```
create database ding_db;
use ding_db;
```

2. **Create Tables**

```
CREATE TABLE `Product_Catalog` (
  `Product_ID` Char(5),
  `Manufacturer_ID` Char(5),
  `Product_Name` VarChar(255),
  `Product_Detail` Char(1),
  `Inventory_Quantity` int(3),
  PRIMARY KEY (`Product_ID`)
);

CREATE TABLE `Customer_Transaction` (
  `Transaction_ID` Char(8),
  `Customer_ID` Char(5),
  `Service_ID` Char(5),
  `Product_ID` Char(5),
  `Transaction_Date` Date,
  PRIMARY KEY (`Transaction_ID`)
);

CREATE TABLE `Employee` (
  `Employee_SSN` Char(9),
  `Employee_FName` VarChar(255),
  `Employee_LName` VarChar(255),
  `Employee_Phone` Char(10),
```

```
  `Certificate_ID` Char(5),
  PRIMARY KEY (`Employee_SSN`)
);

CREATE TABLE `Certificate` (
  `Certification_ID` Char(5),
  `Certificate_Name` VarChar(255),
  PRIMARY KEY (`Certification_ID`)
);

CREATE TABLE `Service` (
  `Service_ID` Char(5),
  `Service_Name` VarChar(255),
  `Certification_ID` Char(5),
  PRIMARY KEY (`Service_ID`)
);

CREATE TABLE `Manufacturer` (
  `Manufacturer_ID` Char(5),
  `Manufacturer_Name` VarChar(255),
  PRIMARY KEY (`Manufacturer_ID`)
);

CREATE TABLE `Used_Product` (
  `Used_Product_ID` Char(5),
  `Used_Product_Name` VarChar(255),
  `Customer_ID` Char(5),
  PRIMARY KEY (`Used_Product_ID`)
);
```

```
CREATE TABLE `Product_Details` (
  `Product_Detail` Char(1),
  `Product_Type` Char(255),
  `Product_Description` VarChar(255),
  `Wheels` INT,
  PRIMARY KEY (`Product_Detail`)
);

CREATE TABLE `Dealership` (
  `Dealership_ID` Char(5),
  `Dealership_Name` VarChar(255),
  PRIMARY KEY (`Dealership_ID`)
);

CREATE TABLE `Customer` (
  `Customer_ID` Char(5),
  `Customer_FName` VarChar(255),
  `Customer_LName` VarChar(255),
  `Customer_Address` VarChar(255),
  PRIMARY KEY (`Customer_ID`)
);

CREATE TABLE `Dealership_Transaction` (
  `Dealership_Transaction_ID` Char(6),
  `Used_Product_ID` Char(5),
  `Dealership_ID` Char(5),
  `Dealership_Transaction_Date` Date,
  PRIMARY KEY (`Dealership_Transaction_ID`));
```

3. **Test all your tables before the load any data**

All Tables are successfully Created.

4. **Start inserting data in each table make sure referential integrity in place**

a. If you are getting an error in this stage that means your data is not correct according to the key relationships.

b. Make sure some of the non-prime attributes accept NULL

DATA INSERTION

```
INSERT INTO  Product_Catalog VALUES ('P001','NSP01', 'Alpha', 'A', 8);
INSERT INTO  Product_Catalog VALUES ('P002','NSP01', 'Seafoam', 'B', 5);
INSERT INTO  Product_Catalog VALUES ('P003','NSP01', 'Cruz', 'C', 12);
INSERT INTO  Product_Catalog VALUES ('P004','SC002', 'Classic Red', 'D', 5);
INSERT INTO  Product_Catalog VALUES ('P005','SC002', 'Hemiway', 'D', 9);
INSERT INTO  Product_Catalog VALUES ('P006','SC002', 'Bob', 'A', 4);
INSERT INTO  Product_Catalog VALUES ('P007','SC002', 'Lunicycle', 'E', 7);
INSERT INTO  Product_Catalog VALUES ('P008','RF003', 'Aventon', 'E', 1);
INSERT INTO  Product_Catalog VALUES ('P009','RF003', 'Mars', 'F', 8);
INSERT INTO  Product_Catalog VALUES ('P010','RF003', 'Jupiter', 'F', 3);
```

	Product_ID	Manufacturer_ID	Product_Name	Product_Detail	Inventory_Quantity
	Filter	Filter	Filter	Filter	Filter
1	P001	NSP01	Alpha	A	8
2	P002	NSP01	Seafoam	B	5
3	P003	NSP01	Cruz	C	12
4	P004	SC002	Classic Red	D	5
5	P005	SC002	Hemiway	D	9
6	P006	SC002	Bob	A	4
7	P007	SC002	Lunicycle	E	7
8	P008	RF003	Aventon	E	1
9	P009	RF003	Mars	F	8
10	P010	RF003	Jupiter	F	3

```
INSERT INTO Customer_Transaction VALUES ('T8883684','C1009', NULL, 'P002', '2021-11-23');
INSERT INTO Customer_Transaction VALUES ('T8883330','C1009', 'S0001', NULL, '2021-11-26');
INSERT INTO Customer_Transaction VALUES ('T8883118','C1025', NULL, 'P002', '2021-10-19');
INSERT INTO Customer_Transaction VALUES ('T8881117','C1025', NULL, 'P004', '2021-11-05');
INSERT INTO Customer_Transaction VALUES ('T8881945','C1029', NULL, 'P005', '2021-10-08');
INSERT INTO Customer_Transaction VALUES ('T8882755','C1033', 'S0001', NULL, '2021-10-12');
INSERT INTO Customer_Transaction VALUES ('T8883438','C1038', NULL, 'P005', '2021-10-07');
INSERT INTO Customer_Transaction VALUES ('T8882870','C1015', NULL, 'P002', '2021-11-13');
INSERT INTO Customer_Transaction VALUES ('T8883583','C1048', NULL, 'P004', '2021-11-26');
INSERT INTO Customer_Transaction VALUES ('T8881728','C1051', NULL, 'P0005', '2021-10-30');
```

```
INSERT INTO Customer_Transaction VALUES ('T8882642','C1051', 'S0005', NULL, '2021-11-05');
INSERT INTO Customer_Transaction VALUES ('T8883930','C1051', 'S0006', NULL, '2021-11-06');
INSERT INTO Customer_Transaction VALUES ('T8883940','C1057', 'S0001', NULL, '2021-10-08');
INSERT INTO Customer_Transaction VALUES ('T8881349','C1064', 'S0005', NULL, '2021-10-12');
```

	Transaction_ID	Customer_ID	Service_ID	Product_ID	Transaction_Date
	Filter	Filter	Filter	Filter	Filter
1	T8881117	C1025	NULL	P004	2021-11-05
2	T8881349	C1064	S0005	NULL	2021-10-12
3	T8881728	C1051	NULL	P0005	2021-10-30
4	T8881945	C1029	NULL	P005	2021-10-08
5	T8882642	C1051	S0005	NULL	2021-11-05
6	T8882755	C1033	S0001	NULL	2021-10-12
7	T8882870	C1015	NULL	P002	2021-11-13
8	T8883118	C1025	NULL	P002	2021-10-19
9	T8883330	C1009	S0001	NULL	2021-11-26
10	T8883438	C1038	NULL	P005	2021-10-07
11	T8883583	C1048	NULL	P004	2021-11-26
12	T8883684	C1009	NULL	P002	2021-11-23
13	T8883930	C1051	S0006	NULL	2021-11-06
14	T8883940	C1057	S0001	NULL	2021-10-08

```
INSERT INTO employee VALUES ('494385964', 'Albert', 'Simonson', '2149056313', 'ETS55' );
INSERT INTO employee VALUES ('494720018', 'Jose', 'Mendosa', NULL, 'BR549' );
INSERT INTO employee VALUES ('355505462', 'Melinda', 'Oberman', '8168836071', 'ST187' );
INSERT INTO employee VALUES ('258358306', 'Gabriel', 'Jackson', '8169190531', 'ETS55' );
INSERT INTO employee VALUES ('709385042', 'Nick', 'Law', '9728083162', 'ST187' );
INSERT INTO employee VALUES ('186048520', 'Roger', 'Quentin', NULL, 'TRP10' );
INSERT INTO employee VALUES ('960516474', 'Guy', 'Tyler', '9729932160', 'TRP10' );
INSERT INTO employee VALUES ('405096132', 'Sylvester', 'Underhill', '2149305607', 'BR549' );
INSERT INTO employee VALUES ('402953160', 'Maria', 'White', NULL, 'OIL54' );
INSERT INTO employee VALUES ('618553302', 'Yolanda', 'Powell', '9729039160', 'CH559' );
```

	Employee_SSN	Employee_FName	Employee_LName	Employee_Phone	Certificate_ID
	Filter	Filter	Filter	Filter	Filter
1	186048520	Roger	Quentin	(NULL)	TRP10
2	258358306	Gabriel	Jackson	8169190531	ETS55
3	355505462	Melinda	Oberman	8168836071	ST187
4	402953160	Maria	White	(NULL)	OIL54
5	405096132	Sylvester	Underhill	2149305607	BR549
6	494385964	Albert	Simonson	2149056313	ETS55
7	494720018	Jose	Mendosa	(NULL)	BR549
8	618553302	Yolanda	Powell	9729039160	CH559
9	709385042	Nick	Law	9728083162	ST187
10	960516474	Guy	Tyler	9729932160	TRP10

```
INSERT INTO  Certificate VALUES ('ETS55','Electrical');
INSERT INTO  Certificate VALUES ('CH559','Chains');
INSERT INTO  Certificate VALUES ('ST187','Seats');
INSERT INTO  Certificate VALUES ('BR549','Breaks');
INSERT INTO  Certificate VALUES ('OIL54','Oil Changes');
INSERT INTO  Certificate VALUES ('TRP10','Tires');
```

	Certification_ID	Certificate_Name
	Filter	Filter
1	BR549	Breaks
2	CH559	Chains
3	ETS55	Electrical
4	OIL54	Oil Changes
5	ST187	Seats
6	TRP10	Tires

```
INSERT INTO  Service VALUES ('S0001','Tire Repair', 'TRP10');
INSERT INTO  Service VALUES ('S0002','Seat Repair', 'ST187');
INSERT INTO  Service VALUES ('S0003','Brake Pad', 'BR549');
INSERT INTO  Service VALUES ('S0004','Oil Change', 'OIL54');
```

```
INSERT INTO  Service VALUES ('S0005','Electrical Diagnostic', 'ETS55');
INSERT INTO  Service VALUES ('S0006','Chain Repair', 'CH559');
```

	Service_ID	Service_Name	Certification_ID
	Filter	Filter	Filter
1	S0001	Tire Repair	TRP10
2	S0002	Seat Repair	ST187
3	S0003	Brake Pad	BR549
4	S0004	Oil Change	OIL54
5	S0005	Electrical Diagnostic	ETS55
6	S0006	Chain Repair	CH559

```
INSERT INTO Manufacturer VALUES('NSP01','Nimbus');
INSERT INTO Manufacturer VALUES('SC002','Schwinn');
INSERT INTO Manufacturer VALUES('RF003','Radio Flyer');
```

	Manufacturer_ID	Manufacturer_Name
	Filter	Filter
1	NSP01	Nimbus
2	RF003	Radio Flyer
3	SC002	Schwinn

```
INSERT INTO used_product VALUES ('P5053','Road Show', 'C1033');
INSERT INTO used_product VALUES ('P5492','Seafoam', 'C1057');
INSERT INTO used_product VALUES ('P5331','Tervane Mountain Bike', 'C1048');
INSERT INTO used_product VALUES ('P5537','Cruz', 'C1064');
INSERT INTO used_product VALUES ('P5421','Ridgeland Hybrid Bike', 'C1033');
INSERT INTO used_product VALUES ('P5312','Pueblo ', 'C1029');
INSERT INTO used_product VALUES ('P5379','Lunicycle', 'C1051');
INSERT INTO used_product VALUES ('P5874','RadRover Step', 'C1051');
INSERT INTO used_product VALUES ('P5069','Mars', 'C1033');
INSERT INTO used_product VALUES ('P5286','Green Machine', 'C1051');
```

	Used_Product_ID	Used_Product_Name	Customer_ID
	Filter	Filter	Filter
1	P5053	Road Show	C1033
2	P5069	Mars	C1033
3	P5286	Green Machine	C1051
4	P5312	Pueblo	C1029
5	P5331	Tervane Mountain Bike	C1048
6	P5379	Lunicycle	C1051
7	P5421	Ridgeland Hybrid Bike	C1033
8	P5492	Seafoam	C1057
9	P5537	Cruz	C1064
10	P5874	RadRover Step	C1051

```
INSERT INTO product_details values ('A','Cycle', 'self powered', 1);
INSERT INTO product_details values ('B','Cycle', 'self powered', 2);
INSERT INTO product_details values ('C','Cycle', 'self powered', 3);
INSERT INTO product_details values ('D','Motor', 'gas powered', 2);
```

```
INSERT INTO product_details values ('E','Motor', 'Electric powered', 2);
INSERT INTO product_details values ('F','Motor', 'Electric powered', 3);
```

	Product_Detail	Product_Type	Product_Description	Wheels
	Filter	Filter	Filter	Filter
1	A	Cycle	self powered	1
2	B	Cycle	self powered	2
3	C	Cycle	self powered	3
4	D	Motor	gas powered	2
5	E	Motor	Electric powered	2
6	F	Motor	Electric powered	3

```
INSERT INTO dealership Values ('D1112','Dylans Used Bikes 101');
INSERT INTO dealership Values ('D1239','Troy Bicycle Lot');
INSERT INTO dealership Values ('D1542','Bikes A2Z');
INSERT INTO dealership Values ('D1455','JRs TexasDirect');
INSERT INTO dealership Values ('D1362','Jimmys Used Bikes');
```

	Dealership_ID	Dealership_Name
	Filter	Filter
1	D1112	Dylans Used Bikes 101
2	D1239	Troy Bicycle Lot
3	D1362	Jimmys Used Bikes
4	D1455	JRs TexasDirect
5	D1542	Bikes A2Z

```
INSERT INTO Customer VALUE ('C1009','Odetta', 'Newton', '316 E Sheen Avenue');
INSERT INTO Customer VALUE ('C1025','Ed ', 'Wolff', '1761 Coyote Circle');
INSERT INTO Customer VALUE ('C1029','Trent', 'Malone', '724 4th Highway');
INSERT INTO Customer VALUE ('C1033','Roland', 'Yoder', NULL);
INSERT INTO Customer VALUE ('C1038','Abe ', 'Farley', '125 Edinburgh Drive');
INSERT INTO Customer VALUE ('C1015','Penelope', 'Homewood', NULL);
INSERT INTO Customer VALUE ('C1048','Kenny', 'Eaton', '637 Spruce Street');
INSERT INTO Customer VALUE ('C1051','Samuel ', 'Richard', '3858 Cold Springs Road');
INSERT INTO Customer VALUE ('C1057','Martha', 'Schneider', NULL);
INSERT INTO Customer VALUE ('C1064','Herb', 'Banks', '9252 Barnes Avenue');
```

	Customer_ID	Customer_FName	Customer_LName	Customer_Address
	Filter	Filter	Filter	Filter
1	C1009	Odetta	Newton	316 E Sheen Avenue
2	C1015	Penelope	Homewood	(NULL)
3	C1025	Ed	Wolff	1761 Coyote Circle
4	C1029	Trent	Malone	724 4th Highway
5	C1033	Roland	Yoder	(NULL)
6	C1038	Abe	Farley	125 Edinburgh Drive
7	C1048	Kenny	Eaton	637 Spruce Street
8	C1051	Samuel	Richard	3858 Cold Springs Road
9	C1057	Martha	Schneider	(NULL)
10	C1064	Herb	Banks	9252 Barnes Avenue

```
INSERT INTO dealership_transaction VALUES ('DT2156','P5053', 'D1112', '2021-11-12');
INSERT INTO dealership_transaction VALUES ('DT2143','P5492', 'D1239', '2021-11-07');
INSERT INTO dealership_transaction VALUES ('DT2281','P5331', 'D1542', '2021-11-12');
INSERT INTO dealership_transaction VALUES ('DT2421','P5537', 'D1455', '2021-12-01');
INSERT INTO dealership_transaction VALUES ('DT2342','P5421', 'D1362', '2021-11-05');
INSERT INTO dealership_transaction VALUES ('DT2531','P5312', 'D1112', '2021-11-27');
INSERT INTO dealership_transaction VALUES ('DT2292','P5379', 'D1112', '2021-11-19');
```

```
INSERT INTO dealership_transaction VALUES ('DT2125','P5874', 'D1239', '2021-11-11');
INSERT INTO dealership_transaction VALUES ('DT2497','P5069', 'D1239', '2021-11-22');
INSERT INTO dealership_transaction VALUES ('DT2119','P5286', 'D1239', '2021-11-25');
```

	Dealership_Transactior	Used_Product_ID	Dealership_ID	Dealership_Transactior
	Filter	Filter	Filter	Filter
1	DT2119	P5286	D1239	2021-11-25
2	DT2125	P5874	D1239	2021-11-11
3	DT2143	P5492	D1239	2021-11-07
4	DT2156	P5053	D1112	2021-11-12
5	DT2281	P5331	D1542	2021-11-12
6	DT2292	P5379	D1112	2021-11-19
7	DT2342	P5421	D1362	2021-11-05
8	DT2421	P5537	D1455	2021-12-01
9	DT2497	P5069	D1239	2021-11-22
10	DT2531	P5312	D1112	2021-11-27

QUERY

Part 3: Chose at least two (2) tables from your project that has relationship and

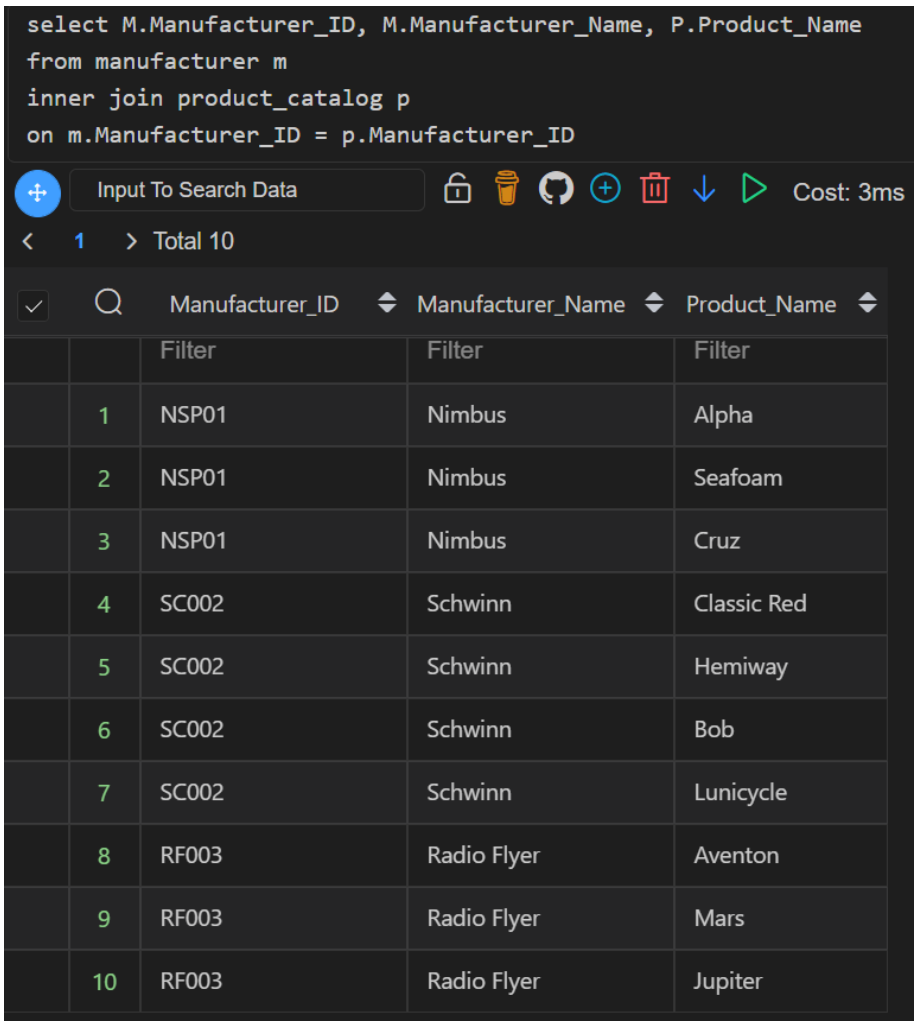
a. **Show your table records.**
b. **Create inner joins between two tables and explain what is the purpose of your join**
c. **Create full joins between two tables and explain what is the purpose of your join**
d. **Create left outer joins between two tables and explain what is the purpose of your join**
e. **Create right outer joins between two tables and explain what is the purpose of your join**
f. **Create intersect between two tables and explain what is the purpose of your intersect**
g. **Create union between two tables and explain what is the purpose of your union**
h. **Create except between two tables and explain what is the purpose of your except**

3. a. Show your table records. (Above)

3.b. Create inner joins between two tables and explain what is the purpose of your join

-- Give me the names of the Products we offer along with Manufacturer's name

```
select M.Manufacturer_ID, M.Manufacturer_Name, P.Product_Name
from manufacturer m
inner join product_catalog p
on m.Manufacturer_ID = p.Manufacturer_ID
```



```
select M.Manufacturer_ID, M.Manufacturer_Name, P.Product_Name
from manufacturer m
inner join product_catalog p
on m.Manufacturer_ID = p.Manufacturer_ID
```

Input To Search Data

Cost: 3ms

1 Total 10

	Manufacturer_ID	Manufacturer_Name	Product_Name
	Filter	Filter	Filter
1	NSP01	Nimbus	Alpha
2	NSP01	Nimbus	Seafoam
3	NSP01	Nimbus	Cruz
4	SC002	Schwinn	Classic Red
5	SC002	Schwinn	Hemiway
6	SC002	Schwinn	Bob
7	SC002	Schwinn	Lunicycle
8	RF003	Radio Flyer	Aventon
9	RF003	Radio Flyer	Mars
10	RF003	Radio Flyer	Jupiter

3.c. Create full joins between two tables and explain what is the purpose of your join

```
/*  Full Join
Want to see full customer transaction details with product ID and product name for those orders in which we sold a product*/
select c.Customer_ID, C.Product_ID, C.Transaction_ID, C.Product_ID, P.Product_Name
from customer_transaction C
left join product_catalog P
on P.Product_ID = C.Product_ID
UNION ALL
Select c.Customer_ID, C.Product_ID, C.Transaction_ID, C.Product_ID, P.Product_Name
from customer_transaction C
right join product_catalog P
on P.Product_ID = C.Product_ID
where P.Product_ID is null;
```

```
select c.Customer_ID, C.Product_ID, C.Transaction_ID, C.Product_ID, P.Product_Name
from customer_transaction C
left join product_catalog P
on P.Product_ID = C.Product_ID
UNION ALL
Select c.Customer_ID, C.Product_ID, C.Transaction_ID, C.Product_ID, P.Product_Name
```

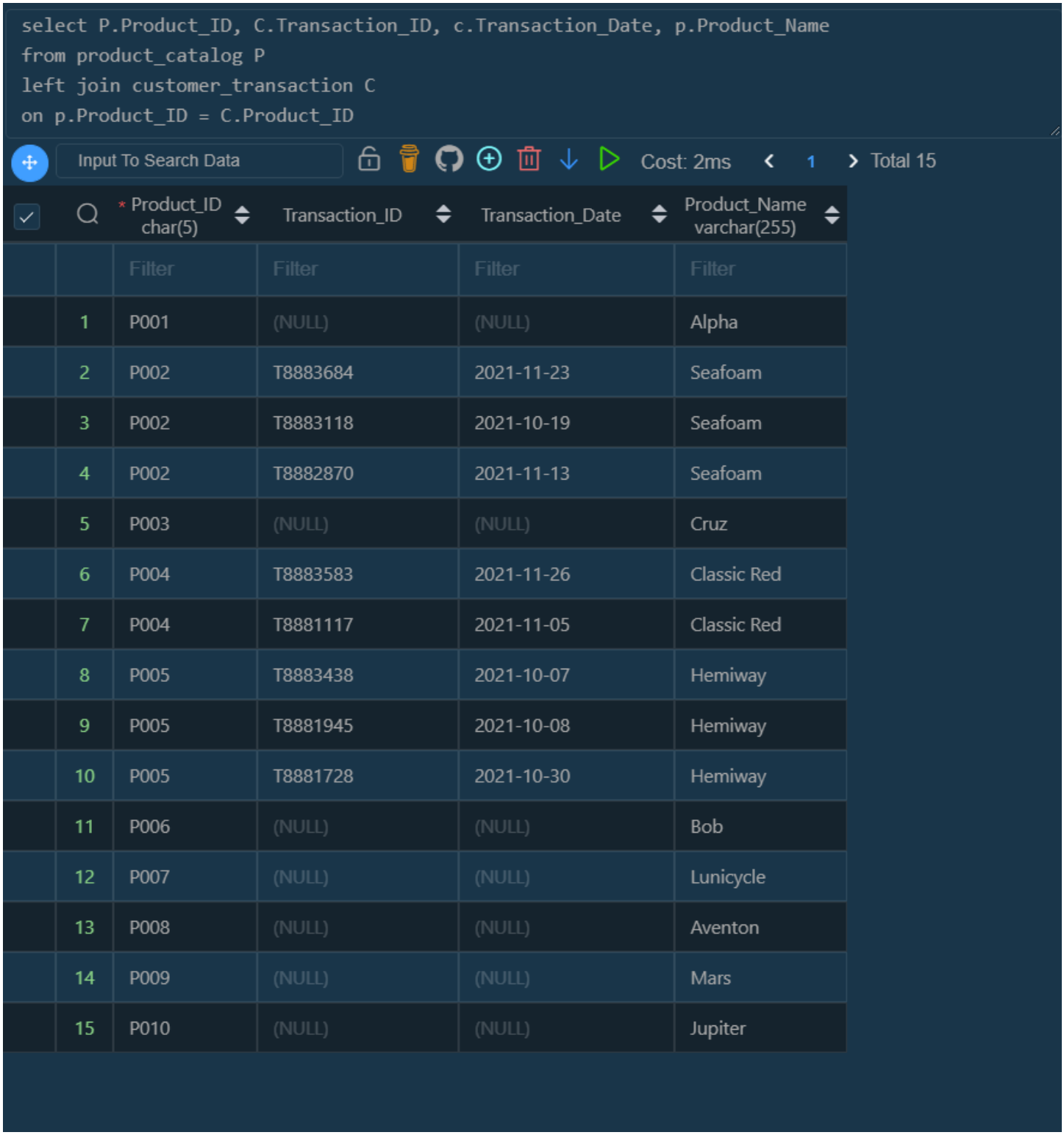
Input To Search Data | Cost: 2ms | 1 | Total 14

	Customer_ID char(5)	Product_ID char(5)	* Transaction_ID char(8)	Product_ID char(5)	Product_Name
	Filter	Filter	Filter	Filter	Filter
1	C1025	P004	T8881117	P004	Classic Red
2	C1064	NULL	T8881349	NULL	(NULL)
3	C1051	P005	T8881728	P005	Hemiway
4	C1029	P005	T8881945	P005	Hemiway
5	C1051	NULL	T8882642	NULL	(NULL)
6	C1033	NULL	T8882755	NULL	(NULL)
7	C1015	P002	T8882870	P002	Seafoam
8	C1025	P002	T8883118	P002	Seafoam
9	C1009	NULL	T8883330	NULL	(NULL)
10	C1038	P005	T8883438	P005	Hemiway
11	C1048	P004	T8883583	P004	Classic Red
12	C1009	P002	T8883684	P002	Seafoam
13	C1051	NULL	T8883930	NULL	(NULL)
14	C1057	NULL	T8883940	NULL	(NULL)

3.d. Create left outer joins between two tables and explain what is the purpose of your join

-- Give me Product_IDs regardless if they have been purchased or not and show which have been purchased

```
select P.Product_ID, C.Transaction_ID, c.Transaction_Date, p.Product_Name
from product_catalog P
left join customer_transaction C
on p.Product_ID = C.Product_ID;
```



```
select P.Product_ID, C.Transaction_ID, c.Transaction_Date, p.Product_Name
from product_catalog P
left join customer_transaction C
on p.Product_ID = C.Product_ID
```

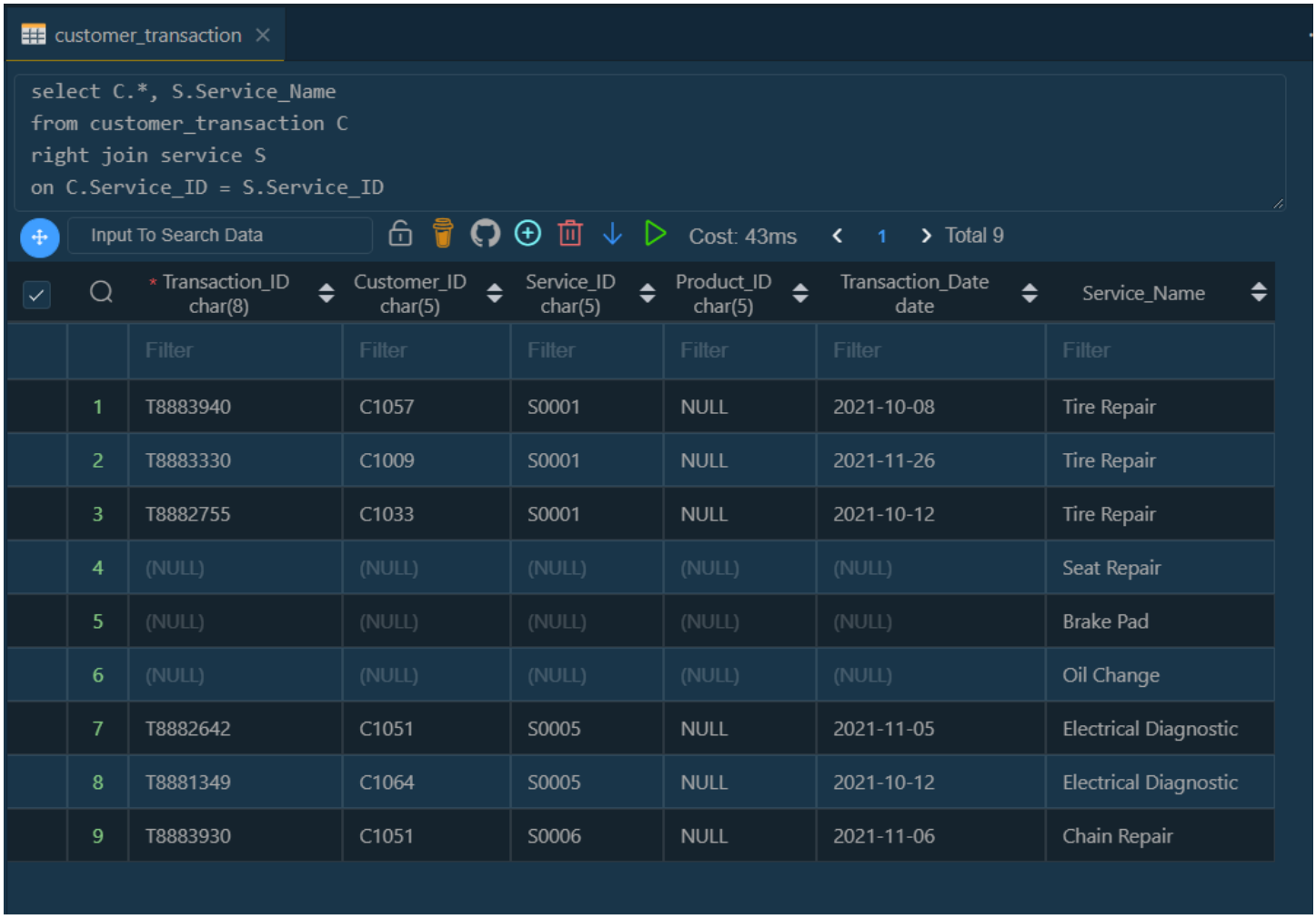
Input To Search Data | Cost: 2ms | 1 | Total 15

	* Product_ID char(5)	Transaction_ID	Transaction_Date	Product_Name varchar(255)
	Filter	Filter	Filter	Filter
1	P001	(NULL)	(NULL)	Alpha
2	P002	T8883684	2021-11-23	Seafoam
3	P002	T8883118	2021-10-19	Seafoam
4	P002	T8882870	2021-11-13	Seafoam
5	P003	(NULL)	(NULL)	Cruz
6	P004	T8883583	2021-11-26	Classic Red
7	P004	T8881117	2021-11-05	Classic Red
8	P005	T8883438	2021-10-07	Hemiway
9	P005	T8881945	2021-10-08	Hemiway
10	P005	T8881728	2021-10-30	Hemiway
11	P006	(NULL)	(NULL)	Bob
12	P007	(NULL)	(NULL)	Lunicycle
13	P008	(NULL)	(NULL)	Aventon
14	P009	(NULL)	(NULL)	Mars
15	P010	(NULL)	(NULL)	Jupiter

3.e. Create right outer joins between two tables and explain what is the purpose of your join

--Find all Services we have performed along with their transaction IDs, for those Services we have yet to perform, list them as well

```
select C.*, S.Service_Name
from customer_transaction C
right join service S
on C.Service_ID = S.Service_ID;
```

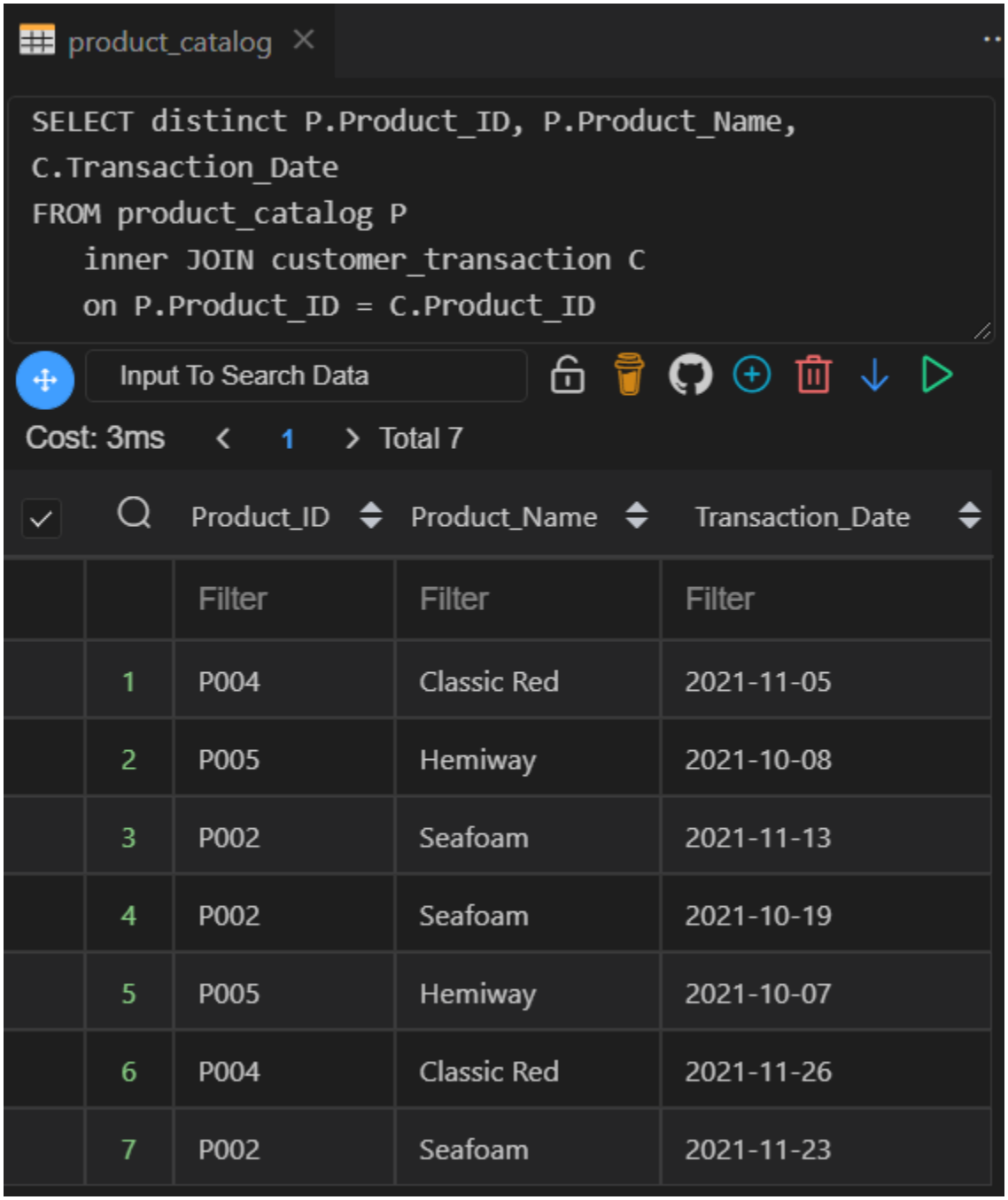


	* Transaction_ID char(8)	Customer_ID char(5)	Service_ID char(5)	Product_ID char(5)	Transaction_Date date	Service_Name
	Filter	Filter	Filter	Filter	Filter	Filter
1	T8883940	C1057	S0001	NULL	2021-10-08	Tire Repair
2	T8883330	C1009	S0001	NULL	2021-11-26	Tire Repair
3	T8882755	C1033	S0001	NULL	2021-10-12	Tire Repair
4	(NULL)	(NULL)	(NULL)	(NULL)	(NULL)	Seat Repair
5	(NULL)	(NULL)	(NULL)	(NULL)	(NULL)	Brake Pad
6	(NULL)	(NULL)	(NULL)	(NULL)	(NULL)	Oil Change
7	T8882642	C1051	S0005	NULL	2021-11-05	Electrical Diagnostic
8	T8881349	C1064	S0005	NULL	2021-10-12	Electrical Diagnostic
9	T8883930	C1051	S0006	NULL	2021-11-06	Chain Repair

3.f. Create intersect between two tables and explain what is the purpose of your intersect

Return all individual Product which we have actually sold

```
SELECT distinct P.Product_ID, P.Product_Name, C.Transaction_Date
FROM product_catalog P
  inner JOIN customer_transaction C
  on P.Product_ID = C.Product_ID;
```



3.g.Create union between two tables and explain what is the purpose of your union

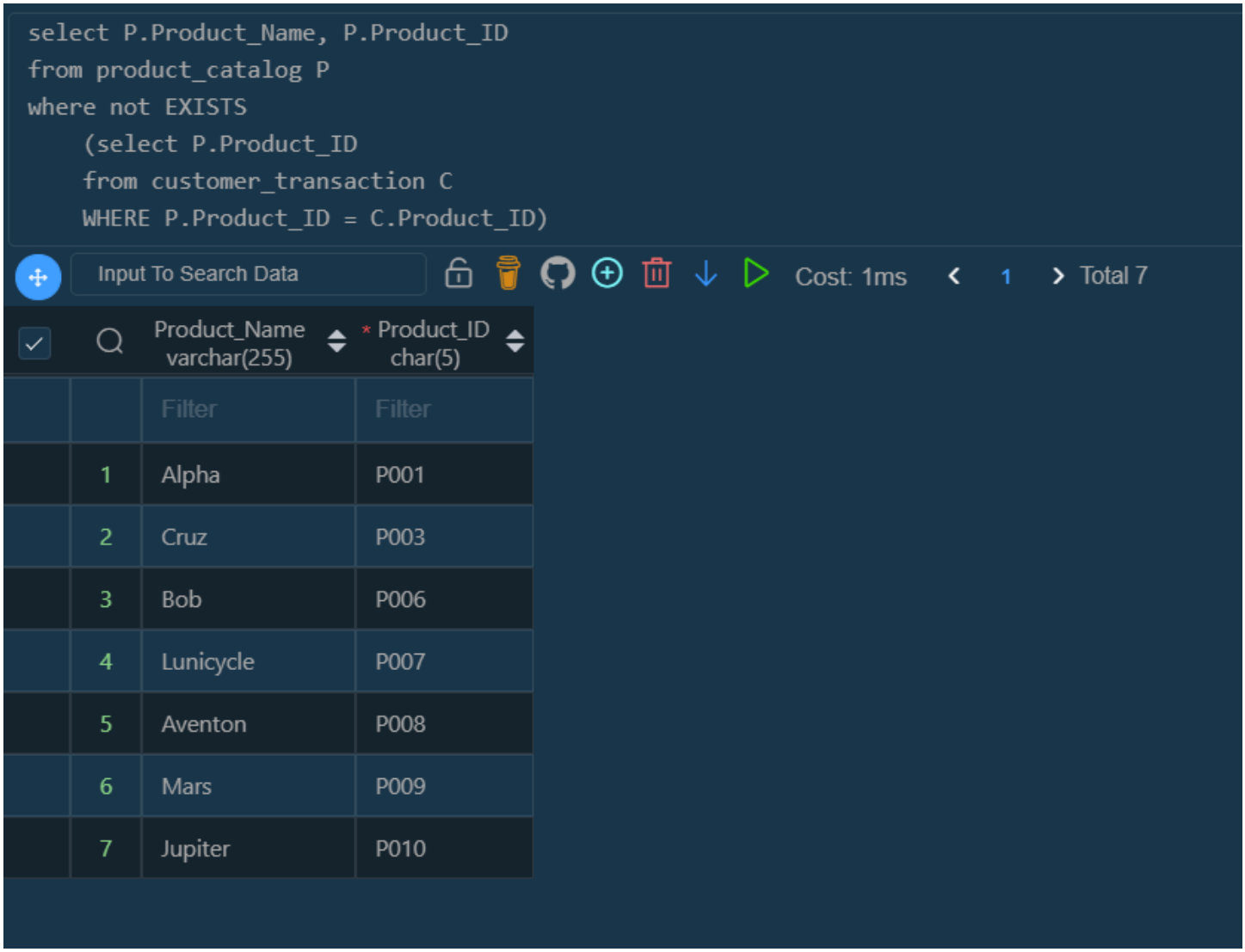
--Get the product id and dates of all PRODUCTS and USED PRODUCTS, NOT SERVICE transactions that the customers have conducted in november

```
Select product_id, transaction_date from customer_transaction
where month(transaction_date) = 11 and product_id is not NULL and product_id not like "NULL"
UNION
Select used_product_id, Dealership_Transaction_Date from dealership_transaction
where month(Dealership_Transaction_Date) = 11;
```

```
Select product_id, transaction_date from customer_transaction
where month(transaction_date) = 11 and product_id is not NULL and product_id not like "NULL"
UNION
Select used_product_id, Dealership_Transaction_Date from dealership_transaction
where month(Dealership_Transaction_Date) = 11
```

Input To Search Data | Cost: 9ms | 1 | Total 13

	product_id	transaction_date
	Filter	Filter
1	P004	2021-11-05
2	P002	2021-11-13
3	P004	2021-11-26
4	P002	2021-11-23
5	P5286	2021-11-25
6	P5874	2021-11-11
7	P5492	2021-11-07
8	P5053	2021-11-12
9	P5331	2021-11-12
10	P5379	2021-11-19
11	P5421	2021-11-05
12	P5069	2021-11-22
13	P5312	2021-11-27

3.h. Create except between two tables and explain what is the purpose of your except

```
--Want to know all products we have yet to sale
select P.Product_Name, P.Product_ID
from product_catalog P
where not EXISTS
   (select P.Product_ID
   from customer_transaction C
   WHERE P.Product_ID = C.Product_ID);
```