

Database Evidence Report

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DATABASE AND APPLICATION DEVELOPMENT

JANUARY 7

UWTSD

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Introduction

I have been given the task of creating a robust data infrastructure and selecting the optimal database solution to support AdventureWorks Cycles ambitious plans. The tables designed within the database are all made to ensure that entities are normalized to the 3rd Normal Form. Primary keys have been defined for each table with relationships established via the use of foreign keys between multiple tables. Within the data infrastructure I will have to be  a variety of processes which AdventureWorks Cycles require. These processes range from manufacturer and customer account registration to order processing and product listing. The database will also include a variety of check constraints which will help ensure that all data is within the correct value range. The database will include a range of transaction, rollbacks and commit operations which can be used to insert, update, and delete data within the tables. The database has been populated with demo data to demonstrate the database's functionality along with all its transactions and rollbacks.

Database Design

ERD Diagram

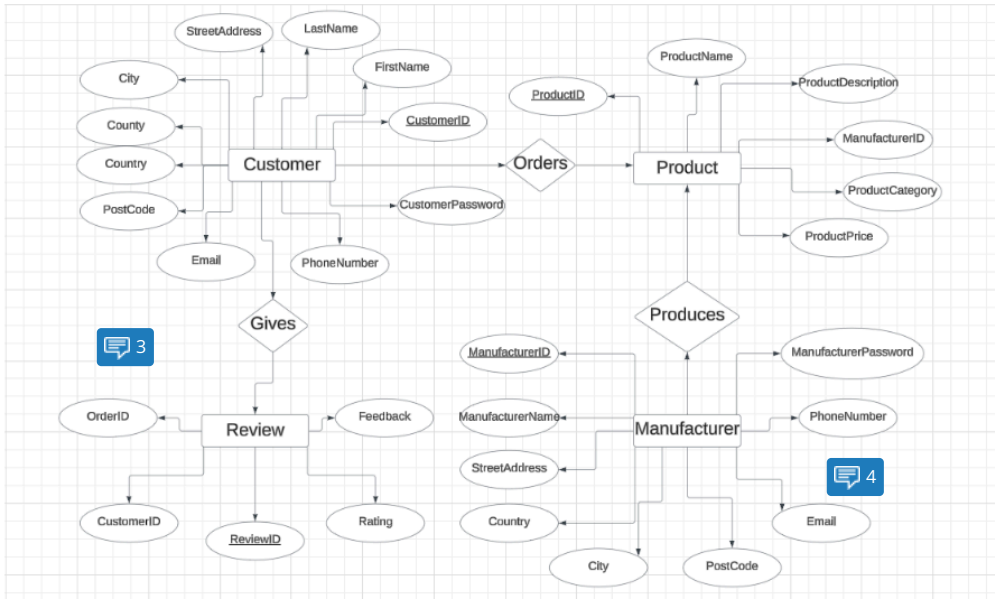
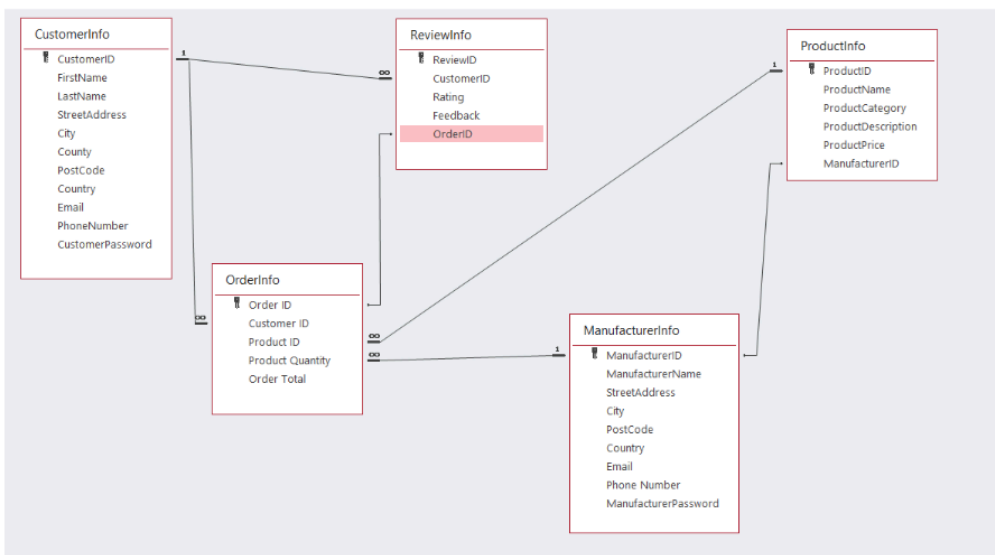


Table Diagram



Database Implementation

Table Structure with Constraints SQL Code

```
1 • Create Database AdventureWorks;
2 • Use AdventureWorks;
3 • CREATE Table CustomerInfo(
4     CustomerID INT PRIMARY KEY AUTO_INCREMENT,
5     FirstName VARCHAR(255) NOT NULL,
6     LastName VARCHAR(255) NOT NULL,
7     StreetAddress VARCHAR(50),
8     City VARCHAR(50),
9     County VARCHAR(50),
10    Country VARCHAR(50),
11    PostCode VARCHAR(50),
12    Email VARCHAR(255) NOT NULL UNIQUE,
13    PhoneNumber VARCHAR(15) NOT NULL UNIQUE,
14    CustomerPassword VARCHAR(50),
15    Check (LENGTH(CustomerPassword) >= 8)
16 );
17 • CREATE Table ManufacturerInfo (
18     ManufacturerID INT PRIMARY KEY AUTO_INCREMENT,
19     ManufacturerName VARCHAR(255) NOT NULL,
20     StreetAddress VARCHAR(255),
21     City VARCHAR(255),
22     Country VARCHAR(255),
23     PostCode VARCHAR(255),
24     Email VARCHAR(255) NOT NULL UNIQUE,
25     PhoneNumber VARCHAR(15) NOT NULL UNIQUE,
26     ManufacturerPassword VARCHAR (50)
27     Check (LENGTH(ManufacturerPassword) >= 8)
28 );
29 • CREATE Table ProductInfo (
30     ProductID INT PRIMARY KEY AUTO_INCREMENT,
31     ProductName VARCHAR(255),
32     ProductDescription VARCHAR(255),
33     ManufacturerID INT,
34     ProductCategory VARCHAR(255) CHECK (ProductCategory IN ('Electric Bike', 'Road Bike', 'Mountain Bike', 'City Bike', 'Cyclocross Bike')),
35     ProductPrice DECIMAL NOT NULL,
36     FOREIGN KEY (ManufacturerID) REFERENCES ManufacturerInfo(ManufacturerID) ON DELETE CASCADE
37 );
```

```

38 • CREATE Table OrderInfo (
39     OrderID INT PRIMARY KEY AUTO_INCREMENT,
40     CustomerID INT,
41     ProductID INT,
42     ProductQuantity INT,
43     OrderTotal INT,
44     FOREIGN KEY (CustomerID) REFERENCES CustomerInfo(CustomerID) ON DELETE CASCADE,
45     FOREIGN KEY (ProductID) REFERENCES ProductInfo(ProductID) ON DELETE CASCADE
46 );
47 • CREATE Table Reviews (
48     ReviewID INT PRIMARY KEY AUTO_INCREMENT,
49     CustomerID INT,
50     OrderID INT,
51     Rating INT,
52     Feedback VARCHAR(255),
53     CHECK (Rating <= 10),
54     FOREIGN KEY (CustomerID) REFERENCES CustomerInfo(CustomerID) ON DELETE CASCADE,
55     FOREIGN KEY (OrderID) REFERENCES OrderInfo(OrderID) ON DELETE CASCADE
56 );

```

Populating Table with Sample Data SQL Code

```

58 • INSERT INTO CustomerInfo (CustomerID, FirstName, LastName, StreetAddress, City, County, Country, PostCode, Email, PhoneNumber, CustomerPassword) VALUES
59     ('1', 'Jake', 'Semmens', '134 Brookfield', 'Neath', 'Neath Port Talbot', 'Wales', 'SA10 7EF', 'Semmensjake@icloud.com', '07368506587', 'Jake2005'),
60     ('2', 'Kayleigh', 'Moore', '635 New Street', 'Swansea', 'Swansea', 'Wales', 'SA1 5SD', 'Mkayleigh54321@hotmail.com', '07656554328', 'KM543210'),
61     ('3', 'Rui', 'Dunkley', '64 Zoo Lane', 'Exeter', 'Exeter', 'England', 'EX2 7DA', 'RDunkExeter@Outlook.com', '01892835643', 'RuiDExT05'),
62     ('4', 'Elis', 'Griffiths', '98 Note Road', 'Blackweir', 'Cardiff', 'Wales', 'CF11 2DB', 'ElsG@icloud.com', '07892873652', 'ElisGCF12'),
63     ('5', 'Jacob', 'Thomas', '56 Serenade Street', 'Berlin', 'Berlin', 'Germany', '10115', 'JTAbroad@bpra.bunde.de', '07865465424', 'DankeJT76');
64

```

CustomerID	FirstName	LastName	StreetAddress	City	County	Country	PostCode	Email	PhoneNumber	CustomerPassword
1	Jake	Semmens	134 Brookfield	Neath	Neath Port Talbot	Wales	SA10 7EF	Semmensjake@icloud.com	07368506587	Jake2005
2	Kayleigh	Moore	635 New Street	Swansea	Swansea	Wales	SA1 5SD	Mkayleigh54321@hotmail.com	07656554328	KM543210
3	Rui	Dunkley	64 Zoo Lane	Exeter	Exeter	England	EX2 7DA	RDunkExeter@Outlook.com	01892835643	RuiDExT05
4	Elis	Griffiths	98 Note Road	Blackweir	Cardiff	Wales	CF11 2DB	ElsG@icloud.com	07892873652	ElisGCF12
5	Jacob	Thomas	56 Serenade Street	Berlin	Berlin	Germany	10115	JTAbroad@bpra.bunde.de	07865465424	DankeJT76

```

65 • INSERT INTO ManufacturerInfo (ManufacturerID, ManufacturerName, StreetAddress, City, Country, PostCode, Email, PhoneNumber, ManufacturerPassword) VALUES
66     ('1', 'WheelyGoodBikes', 'Unit 65 Pen Parc', 'Swansea', 'Wales', 'SA1 6BJ', 'Service@WheelyGoodBikes.co.uk', '09876789876', 'WheelyGoodPassword'),
67     ('2', 'BargainBikes', 'Unit 7b Crescent Industrial Estate', 'Manchester', 'England', 'M1 1AG', 'Support@BargainBike.co.uk', '024567389432', 'Bargain123'),
68     ('3', 'BikeTyson', 'Unit 4 Phoenix Way', 'New York', 'USA', 'NY 11212', 'Contact@IronTyson.com', '09000297364', 'IronTyson'),
69     ('4', 'LeBikeShop', 'Unit 1a Le Bleu', 'Lyon', 'France', '69002', 'Support@LeBikeShop.fr', '00920000372', 'LeFrance'),
70     ('5', 'BikeHeaven', 'Unit 9 Heavenly Plaza', 'Cardiff', 'Wales', 'CF10 2EQ', 'Service@BikeHeaven.com', '02937487476', 'HeavenlyPassword');
71

```

ManufacturerID	ManufacturerName	StreetAddress	City	Country	PostCode	Email	PhoneNumber	ManufacturerPassword
1	WheelyGoodBikes	Unit 65 Pen Parc	Swansea	Wales	SA1 6BJ	Service@WheelyGoodBikes.co.uk	09876789876	WheelyGoodPassword
2	BargainBikes	Unit 7b Crescent Industrial Estate	Manchester	England	M1 1AG	Support@BargainBike.co.uk	024567389432	Bargain123
3	BikeTyson	Unit 4 Phoenix Way	New York	USA	NY 11212	Contact@IronTyson.com	09000297364	IronTyson
4	LeBikeShop	Unit 1a Le Bleu	Lyon	France	69002	Support@LeBikeShop.fr	00920000372	LeFrance
5	BikeHeaven	Unit 9 Heavenly Plaza	Cardiff	Wales	CF10 2EQ	Service@BikeHeaven.com	02937487476	HeavenlyPassword

```

72 • INSERT INTO ProductInfo (ProductID, ProductName, ProductDescription, ManufacturerID, ProductCategory, ProductPrice) VALUES
73 ('1', 'Bike-O-Tron 3000', 'The latest edition to Wheely Good Bikes Bike-O-Tron series! Featuring a high-torque electric motor, the Bike-O-Tron 3000 can reach s
74 ('2', 'The Bargain', 'Discover the joy of cycling without breaking the bank. This budget friendly bike proves you do not need to spend a fortune for quality ar
75 ('3', 'La Montagne', 'The mountain bike designed to take you to new heights and through the roughest of terrains. Conquer the French Alps with La Montagne.', '
76 ('4', 'The Reliable', 'Your reliable partner which is built to last! Step into the world of simplicity, durability and comfort with The Reliable Bicycle.', '3'
77 ('5', 'The Hermes', 'The God of Speed, experience the pinnacle of cyclocross performance, where speed, agility, and endurance converge into one godly machine!'
78

```

ProductID	ProductName	ProductDescription	ManufacturerID	ProductCategory	ProductPrice
1	Bike-O-Tron 3000	The latest edition to Wheely Good Bikes Bike-O-Tron series! Featuring a high-torque electric motor, the Bike-O-Tron 3000 can reach speeds of up...	1	Electric Bike	2000
2	The Bargain	Discover the joy of cycling without breaking the bank. This budget friendly bike proves you do not need to spend a fortune for quality and enjoy...	2	Road Bike	100
3	La Montagne	The mountain bike designed to take you to new heights and through the roughest of terrains. Conquer the French Alps with La Montagne.	4	Mountain Bike	1800
4	The Reliable	Your reliable partner which is built to last! Step into the world of simplicity, durability and comfort with The Reliable Bicycle.	3	City Bike	200
5	The Hermes	The God of Speed, experience the pinnacle of cyclocross performance, where speed, agility, and endurance converge into one godly machine!	5	Cyclocross Bike	8000
NULL	NULL	NULL	NULL	NULL	NULL

```

79 • INSERT INTO OrderInfo (OrderID, CustomerID, ProductID, ProductQuantity, OrderTotal) VALUE:

```

```

80 ('1', '3', '2', '4', '2000'),
81 ('2', '2', '1', '1', '2000'),
82 ('3', '1', '3', '2', '3600'),
83 ('4', '5', '4', '3', '600'),
84 ('5', '4', '2', '2', '1000'),
85 ('6', '3', '4', '2', '400'),
86 ('7', '2', '5', '1', '8000'),
87 ('8', '1', '1', '1', '2000'),
88 ('9', '5', '5', '2', '16000'),
89 ('10', '4', '1', '2', '4000');

```

OrderID	CustomerID	ProductID	ProductQuantity	OrderTotal
1	3	2	4	2000
2	2	1	1	2000
3	1	3	2	3600
4	5	4	3	600
5	4	2	2	1000
6	3	4	2	400
7	2	5	1	8000
8	1	1	1	2000
9	5	5	2	16000
10	4	1	2	4000
NULL	NULL	NULL	NULL	NULL

```

91 • INSERT INTO Reviews (ReviewID, CustomerID, OrderID, Rating, Feedback) VALUES
92 ('1', '5', '4', '10', 'Great Sevice and Quality.'),
93 ('2', '1', '3', '8', 'Delivery was a bit late but overall great quality product.'),
94 ('3', '2', '7', '9', 'Happy with Procdct.'),
95 ('4', '3', '1', '7', 'Cheap Price but Mediocre Quality.'),
96 ('5', '2', '2', '10', 'Nothing to Complain About.'),
97 ('6', '1', '8', '10', 'Phenomenal.'),
98 ('7', '3', '6', '8', 'Worth It!'),
99 ('8', '5', '9', '10', 'Everything to praise, nothing to complain about!'),
100 ('9', '4', '5', '6', 'Would have hoped for better delivery and a discount for the amount I paid.'),
101 ('10', '4', '10', '8', 'So happy with what I bought.');
```

ReviewID	CustomerID	OrderID	Rating	Feedback
1	5	4	10	Great Sevice and Quality.
2	1	3	8	Delivery was a bit late but overall great quality ...
3	2	7	9	Happy with Procdct.
4	3	1	7	Cheap Price but Mediocre Quality.
5	2	2	10	Nothing to Complain About.
6	1	8	10	Phenomenal.
7	3	6	8	Worth It!
8	5	9	10	Everything to praise, nothing to complain about!
9	4	5	6	Would have hoped for better delivery and a dis...
10	4	10	8	So happy with what I bought.
NULL	NULL	NULL	NULL	NULL

Transaction Rollback and Commit Operations SQL Code

I have chosen to implement these transactional scenarios as I believe that they are situations which would occur frequently during day-to-day business operations for AdventureWorks. Changes in price, insertion of new products, and discontinuation of old products are all frequent events in the world of business which AdventureWorks would be familiar with.

Insert Transaction

```

109 • START transaction;
110 • INSERT INTO ProductInfo (ProductID, ProductName, ProductDescription, ManufacturerID, ProductCategory, ProductPrice) VALUES ('6',
111 • COMMIT;
112
113 • Select*from ProductInfo;
114
115 • START transaction;
```

ProductID	ProductName	ProductDescription	ManufacturerID
1	Bike-O-Tron 3000	The latest edition to Wheely Good Bikes Bike-O-Tron series! Featuring a high-torque electric motor, the Bike-O-Tron 3000 can reach speeds of up...	1
2	The Bargain	Discover the joy of cycling without breaking the bank. This budget friendly bike proves you do not need to spend a fortune for quality and enjoy...	2
3	La Montagne	The mountain bike designed to take you to new heights and through the roughest of terrains. Conquer the French Alps with La Montagne.	4
4	The Reliable	Your reliable partner which is built to last! Step into the world of simplicity, durability and comfort with The Reliable Bicycle.	3
5	The Hermes	The God of Speed, experience the pinnacle of cyclocross performance, where speed, agility, and endurance converge into one godly machine!	5
6	The Green	A completely solar powered electric bike!	2
NULL	NULL	NULL	NULL

Delete Transaction

- 123 • `START transaction;`
- 124 • `DELETE FROM ProductInfo WHERE ProductID=6;`
- 125 • `COMMIT;`

Result Grid						
Filter Rows:		Edit:		Export/Import:		Wrap Cell
ProductID	ProductName	ProductDescription	ManufacturerID	ProductCategory	ProductPrice	
1	Bike-O-Tron 3000	The latest edition to...	1	Electric Bike	2000	
2	The Bargain	Discover the joy of ...	2	Road Bike	100	
3	La Montagne	The mountain bike d...	4	Mountain Bike	1800	
4	The Reliable	Your reliable partner...	3	City Bike	200	
5	The Hermes	The God of Speed, ...	5	Cyclocross Bike	8000	
NULL	NULL	NULL	NULL	NULL	NULL	

Code

- 115 • `START transaction;`
- 116 • `UPDATE ProductInfo SET ProductPrice = 100 WHERE ProductName='The Bargain';`
- 117 • `SAVEPOINT before_update;`
- 118 • `UPDATE ProductInfo SET ProductPrice = 400 WHERE ProductName='The Bargain';`
- 119 • `ROLLBACK TO before_update;`
- 120 • `COMMIT;`

Original

Result Grid						
Filter Rows:		Edit:		Export/Import:		Wrap Cell Content:
ProductID	ProductName	ProductDescription	ManufacturerID	ProductCategory	ProductPrice	
1	Bike-O-Tron 3000	The latest edition to...	1	Electric Bike	2000	
2	The Bargain	Discover the joy of ...	2	Road Bike	100	
3	La Montagne	The mountain bike d...	4	Mountain Bike	1800	
4	The Reliable	Your reliable partner...	3	City Bike	200	
5	The Hermes	The God of Speed, ...	5	Cyclocross Bike	8000	
6	The Green	A completely solar p...	2	Electric Bike	500	
NULL	NULL	NULL	NULL	NULL	NULL	

Before Rollback

ProductID	ProductName	ProductDescription	ManufacturerID	ProductCategory	ProductPrice	
1	Bike-O-Tron 3000	The latest edition to...	1	Electric Bike	2000	
2	The Bargain	Discover the joy of ...	2	Road Bike	400	
3	La Montagne	The mountain bike d...	4	Mountain Bike	1800	
4	The Reliable	Your reliable partner...	3	City Bike	200	
5	The Hermes	The God of Speed, ...	5	Cyclocross Bike	8000	
6	The Green	A completely solar p...	2	Electric Bike	500	
NULL	NULL	NULL	NULL	NULL	NULL	

After Rollback

	ProductID	ProductName	ProductDescription	ManufacturerID	ProductCategory	ProductPrice
▶	1	Bike-O-Tron 3000	The latest edition to...	1	Electric Bike	2000
	2	The Bargain	Discover the joy of ...	2	Road Bike	100
	3	La Montagne	The mountain bike d...	4	Mountain Bike	1800
	4	The Reliable	Your reliable partner...	3	City Bike	200
	5	The Hermes	The God of Speed, ...	5	Cydocross Bike	8000
	6	The Green	A completely solar p...	2	Electric Bike	500
✱	NULL	NULL	NULL	NULL	NULL	NULL



Database Evidence Report

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

50/100

PAGE 1

PAGE 2



Comment 1 |  Transferable Skills

brief ToC provided

PAGE 3



Comment 2 |  Transferable Skills

While the introduction outlines what the report will cover, it doesn't fully emphasize why this work is important for AdventureWorks Cycles' business.

PAGE 4



Comment 3 |  Knowledge&Understanding Skills

most of entities and attributes identified.



Comment 4 |  Knowledge&Understanding Skills

Lack of Detail in relationships

PAGE 5



Comment 5 |  Cognitive &Intellectual Skills

Screenshots show successful execution or evidence of the database functioning

PAGE 6



Comment 6 |  Cognitive &Intellectual Skills

Add annotations or captions to each screenshot explaining what is shown and why it's relevant to the report.



Comment 7 | Cognitive & Intellectual Skills

Ensuring that all visuals are properly labelled and numbered is key to improving the readability and professionalism of your report.



Comment 8 | Practical Application Skills

SQL statements used to create tables and insert data are clear and well-structured.

PAGE 7



Comment 9 | Practical Application Skills

Effective Use of Primary and Foreign Keys

PAGE 8



Comment 10 | Practical Application Skills

shows a practical understanding of how transactions work in database systems.

PAGE 9

PAGE 10



Comment 11 | Transferable Skills

conclusion and references missing

GRADING FORM: DAD_2024

JAKE SEMMENS

50

LITERATURE SKILLS



0

KNOWLEDGE&UNDERSTANDING SKILLS



11

COGNITIVE &INTELLECTUAL SKILLS



14

PRACTICAL APPLICATION SKILLS



13

TRANSFERABLE SKILLS



12