

Gallery Customer History Form

Customer Name

Jackson, Elizabeth
123 – 4th Avenue
Fonthill, ON
L3J 4S4

Phone (206) 284-6783

Purchases Made

Artist	Title	Purchase Date	Sales Price
03 - Carol Channing	Laugh with Teeth	09/17/2000	7000.00
15 - Dennis Frings	South toward Emerald Sea	05/11/2000	1800.00
03 - Carol Channing	At the Movies	02/14/2002	5550.00
15 - Dennis Frings	South toward Emerald Sea	07/15/2003	2200.00

The Gill Art Gallery wishes to maintain data on their customers, artists and paintings. They may have several paintings by each artist in the gallery at one time. Paintings may be bought and sold several times. In other words, the gallery may sell a painting, then buy it back at a later date and sell it to another customer.

Unnormalized

Name	Address	Phone	Purchases(ArtistId, ArtistName, ArtTitle, PurchaseDate, Price)
Jackson, Elizabeth	123 - 4th Avenue Fonthill ON L3J4S4	(206) 284-6783	Carol Channing, Laugh with Teeth, 9/17/2000, \$7000.00
Smith, John	123 Main Street New York, NY 10001	(123) 867-5309	Rick Steves, Travels through Europe, 9/01/2002, \$1050.00
Jackson, Elizabeth	123 - 4th Avenue Fonthill ON L3J4S4	(206) 284-6783	Dennis Frings, South toward Emerald Sea, 5/11/2000, \$1800.00
Jackson, Elizabeth	123 - 4th Avenue Fonthill ON L3J4S4	(206) 284-6783	Carol Channing, At the Movies, 2/14/2002, \$5550.00
Jackson, Elizabeth	123 - 4th Avenue Fonthill ON L3J4S4	(206) 284-6783	Dennis Frings, South toward Emerald Sea, 7/15/2003, \$2200.00

First Normal Form (1NF)

Customers					
CustomerID (PK)	Name	Address	Phone		
1	Jackson, Elizabeth	123 - 4th Avenu Fonthill ON L3J4S4	(206) 284-6783		
2	Smith, John	123 Main Street New York, NY 10001	(123) 867-5309		
Customer Purchases					
PurchaseID(PK)	CustomerID (FK)	Purchase Date	Artist Name	Title	Price
1	1	9/17/2000	Carol Channing	Laugh with Teeth	\$7,000.00
2	1	5/11/2000	Dennis Frings	South toward Emerald Sea	\$1,800.00
3	1	2/14/2002	Carol Channing	At the Movies	\$5,550.00
4	1	7/15/2003	Dennis Frings	South toward Emerald Sea	\$2,200.00
5	2	9/1/2002	Rick Steves	Travels through Europe	\$1,050.00
1NF					
In 1st Normal Form, no table should contain duplicative columns (purchase 1, purchase 2, ... purchase n) that one could use to get other types of information. Every table is organized in rows with primary keys that uniquely identify it.					

Second Normal Form (2NF)

Customers					
CustomerID (PK)	Name	Address	Phone		
1	Jackson, Elizabeth	123 - 4th Avenue Fonthill ON L3J4S4	(206) 284-6783		
2	Smith, John	123 Main Street New York, NY 10001	(123) 867-5309		
Customer Purchases					
PurchaseID (PK)	CustomerID (FK)	ArtID (FK)	Purchase Date	Price	
1	1	1	9/17/2000	\$7,000.00	
2	1	2	5/11/2000	\$1,800.00	
3	1	3	2/14/2002	\$5,550.00	
4	1	2	7/15/2003	\$2,200.00	
5	2	4	9/1/2002	\$1,050.00	
Art					
ArtID (PK)	Artist Name	Title			
1	Carol Channing	Laugh with Teeth			
2	Dennis Frings	South toward Emerald Sea			
3	Carol Channing	At the Movies			
4	Rick Steves	Travels through Europe			
2NF					
In 2nd Normal Form, the table must already be in 1NF.					
Any Non-key Attribute must be dependent on the primary key.					

Third Normal Form (3NF)

Customers				
CustomerID (PK)	Name	Address	Phone	
1	Jackson, Elizabeth	123 - 4th Avenue Fonthill ON L3J4S4	(206) 284-6783	
2	Smith, John	123 Main Street New York, NY 10001	(123) 867-5309	
Customer Purchases				
PurchaseID (PK)	CustomerID (FK)	ArtID (FK)	Purchase Date	Price
1	1	1	9/17/2000	\$7,000.00
2	1	2	5/11/2000	\$1,800.00
3	1	3	2/14/2002	\$5,550.00
4	1	2	7/15/2003	\$2,200.00
5	2	4	9/1/2002	\$1,050.00
Art				
ArtID (PK)	ArtistID (FK)	Title		
1	1	Laugh with Teeth		
2	2	South toward Emerald Sea		
3	1	At the Movies		
4	3	Travels through Europe		
Artist				
ArtistID (PK)	First Name	Last Name		
1	Carol	Channing		
2	Dennis	Frings		
3	Rick	Steves		
3NF				
In 3rd Normal Form, the table must already be in 2NF.				
There cannot be any transitive dependency between columns (e.g. in 2NF Artist Name was dependent on Art Id)				