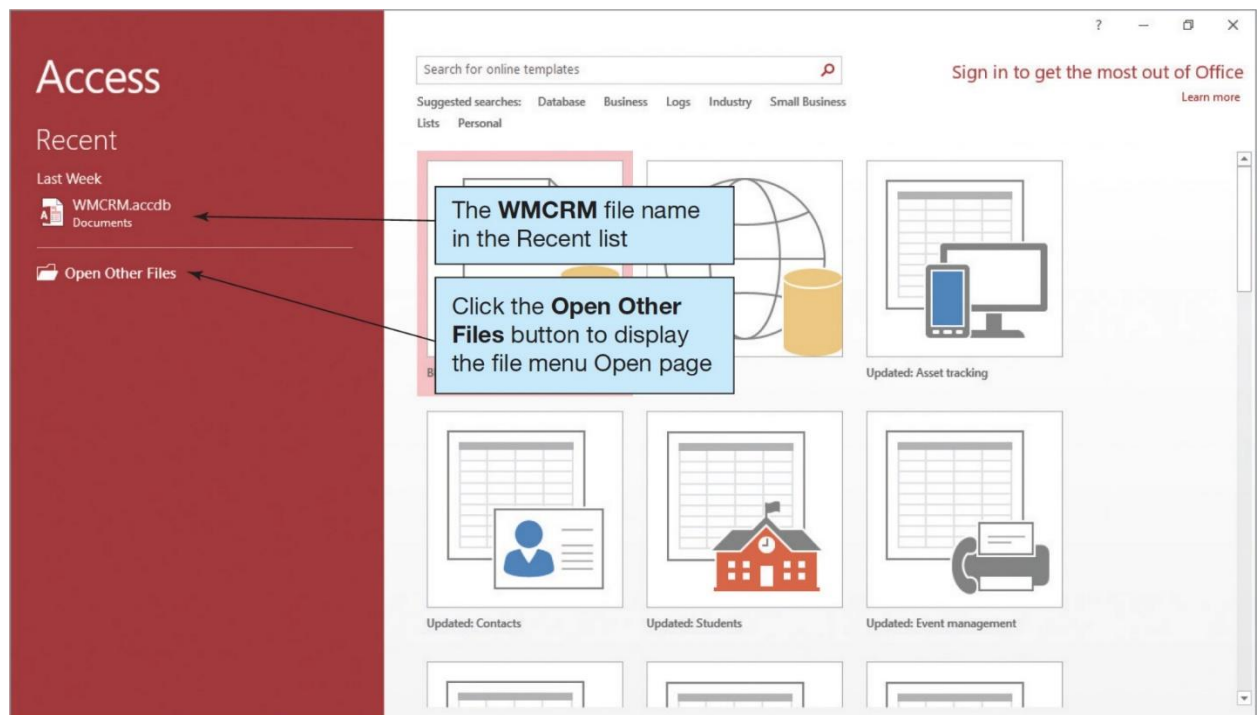# CSIS 2300 – Database I

Laboratory 2- Working with Multiple Tables in Microsoft Access

Objectives:

1. Learn how to work with multiple tables
2. Apply Normalization Techniques
3. Identify primary and foreign keys
4. Establish relationships in MS Access
5. Enforce Referential Integrity

1. Download the WMCRM-Combined-Data database and save it in your computer.
2. Open the database by clicking Open other files

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3. Enable content in the security warning.

4. In the navigation panel, double click the CUSTOMER_CONTACT table. Familiarize yourself with the data.

CustomerID	LastName	FirstName	Address	City	Sta	ZIP	Phone	Fax	EmailAddress	Date	Type	Remarks
1	Griffey	Ben	5678 25th NE	Seattle	WA	98178	206-456-2345		Ben.Griffey@somewhere.com	7/7/2016	Email	Sent general information.
1	Griffey	Ben	5678 25th NE	Seattle	WA	98178	206-456-2345		Ben.Griffey@somewhere.com	7/7/2016	Phone	General interest in a Gaea.
1	Griffey	Ben	5678 25th NE	Seattle	WA	98178	206-456-2345		Ben.Griffey@somewhere.com	7/12/2016	Phone	Set up an appointment.
1	Griffey	Ben	5678 25th NE	Seattle	WA	98178	206-456-2345		Ben.Griffey@elsewhere.com	7/14/2016	Meeting	Bought a HiStandard.
1	Griffey	Ben	5678 25th NE	Seattle	WA	98178	206-456-2345		Ben.Griffey@somewhere.com	7/21/2016	Email	Sent a standard follow-up message.
3	Christman	Jessica	3456 36th SW	Seattle	WA	98189	206-467-3456		Jessica.Christman@somewhere.com	7/19/2016	Phone	Interested in a SUHi, set up an appointment.
3	Christman	Jessica	3456 36th SW	Seattle	WA	98189	206-467-3456		Jessica.Christman@somewhere.com	7/27/2016	Meeting	Bought a SUHi.
3	Christman	Jessica	3456 36th SW	Seattle	WA	98189	206-467-3456		Jessica.Christman@somewhere.com	8/3/2016	Email	Sent a standard follow-up message.
4	Christman	Rob	4567 47th NW	Seattle	WA	98167	206-478-4567	206-478	Rob.Christman@somewhere.com	7/27/2016	Phone	Interested in a HiStandard, set up an appointment.
4	Christman	Rob	4567 47th NW	Seattle	WA	98167	206-478-4567	206-478	Rob.Christman@somewhere.com	8/2/2016	Meeting	Talked up to a HiLuxury. Customer bought one.
4	Christman	Rob	4567 47th NW	Seattle	WA	98167	206-478-4567	206-478	Rob.Christman@somewhere.com	8/10/2016	Email	Sent a standard follow-up message.
5	Hayes	Judy	234 Highland Place	Edmonds	WA	98210	425-354-8765		Judy.Hayes@somewhere.com	8/15/2016	Phone	General interest in a Gaea.

Record: 1 of 12 No Filter Search

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5. Open the Customer Contact Data Input form and examine it.

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6. Close the input form. Open the Wallingford Motors Customer Contact Report and examine it.

Wallingford Motors Customer Contact Report

CustomerID	Date	LastName	FirstName	EmailAddress	Type	Remarks
1						
	7/7/2016	Griffey	Ben	Ben.Griffey@somewhere.com	Phone	General interest in a Gaea.
	7/7/2016	Griffey	Ben	Ben.Griffey@somewhere.com	Email	Sent general information.
	7/12/2016	Griffey	Ben	Ben.Griffey@somewhere.com	Phone	Set up an appointment.
	7/14/2016	Griffey	Ben	Ben.Griffey@somewhere.com	Meeting	Bought a HiStandard.
	7/21/2016	Griffey	Ben	Ben.Griffey@somewhere.com	Email	Sent a standard follow-up message.
3						
	7/19/2016	Christman	Jessica	Jessica.Christman@somewhere.com	Phone	Interested in a SUHi, set up an appointment.
	7/27/2016	Christman	Jessica	Jessica.Christman@somewhere.com	Meeting	Bought a SUHi.
	8/3/2016	Christman	Jessica	Jessica.Christman@somewhere.com	Email	Sent a standard follow-up message.
4						
	7/27/2016	Christman	Rob	Rob.Christman@somewhere.com	Phone	Interested in a HiStandard, set up an appointment.
	8/2/2016	Christman	Rob	Rob.Christman@somewhere.com	Meeting	Talked up to a HiLuxury. Customer bought one.
	8/10/2016	Christman	Rob	Rob.Christman@somewhere.com	Email	Sent a standard follow-up message.
5						
	8/15/2016	Hayes	Judy	Judy.Hayes@somewhere.com	Phone	General interest in a Gaea.

Contact data for each customer are grouped together and sorted by date

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7. Close the report. Now assume that Ben Giffrey email address has change from Ben.Griffrey@somewhere.com to Ben.Girffrey@elsewhere.com. How are we going to update this? Open the data input form object and edit the record.

Customer Contact Data Input Form

Customer Contact Data Input Form

Field	Value
CustomerID	1
LastName	Griffey
FirstName	Ben
Address	5678 25th NE
City	Seattle
State	WA
ZIP	98178
Phone	206-456-2345
Fax	
EmailAddress	Ben.Griffey@elsewhere.com
Date	7/7/2016
Type	Email
Remarks	Sent general information.

The email address has been updated

The **Next Record** button

Record: 1 of 12   No Filter   Search

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8. Click next record, what did you notice? Again edit the email of Ben in the next record and click next again and click next again and change Ben's record. Do this 3 more times.
9. Open the report. What do you notice?

Wallingford Motors Customer Contact Report

CustomerID	Date	LastName	FirstName	EmailAddress	Type	Remarks
1						
	7/7/2016	Griffey	Ben	Ben.Griffey@elsewhere.com	Phone	General interest in a Gaea.
	7/7/2016	Griffey	Ben	Ben.Griffey@elsewhere.com	Email	Sent general information.
	7/12/2016	Griffey	Ben	Ben.Griffey@elsewhere.com	Phone	Set up an appointment.
	7/14/2016	Griffey	Ben	Ben.Griffey@elsewhere.com	Meeting	Bought a HiStandard.
	7/21/2016	Griffey	Ben	Ben.Griffey@somewhere.com	Email	Sent a standard follow-up message.
3						
	7/19/2016	Christman	Jessica	Jessica.Christman@somewhere.com	Phone	Interested in a SUHi, set up an appointment.
	7/27/2016	Christman	Jessica	Jessica.Christman@somewhere.com	Meeting	Bought a SUHi.
	8/3/2016	Christman	Jessica	Jessica.Christman@somewhere.com	Email	Sent a standard follow-up message.
4						
	7/27/2016	Christman	Rob	Rob.Christman@somewhere.com	Phone	Interested in a HiStandard, set up an appointment.
	8/2/2016	Christman	Rob	Rob.Christman@somewhere.com	Meeting	Talked up to a HiLuxury. Customer bought one.
	8/10/2016	Christman	Rob	Rob.Christman@somewhere.com	Email	Sent a standard follow-up message.
5						
	8/15/2016	Hayes	Judy	Judy.Hayes@somewhere.com	Phone	General interest in a Gaea.

A modification problem has occurred. Not all records were updated with the new email address, and the database records are now inconsistent

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10. To avoid, the modification problems, we have to normalize the data. Applying the normalization process, we will arrive on the following tables.

CUSTOMER (CustomerID, LastName, FirstName, Address, City, State, ZIP, Phone, Fax, EmailAddress)
CONTACT (ContactID, *CustomerID*, ContactDate, ContactType, Remarks)

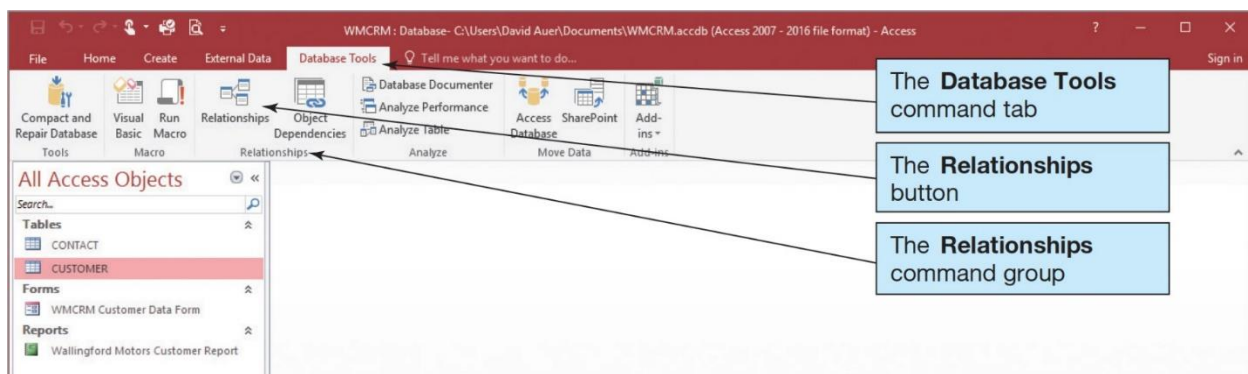with the referential integrity constraint:

CustomerID in CONTACT must exist in CustomerID in CUSTOMER

11. Using what you have learned in the previous laboratory, create the CONTACT table using the following specification
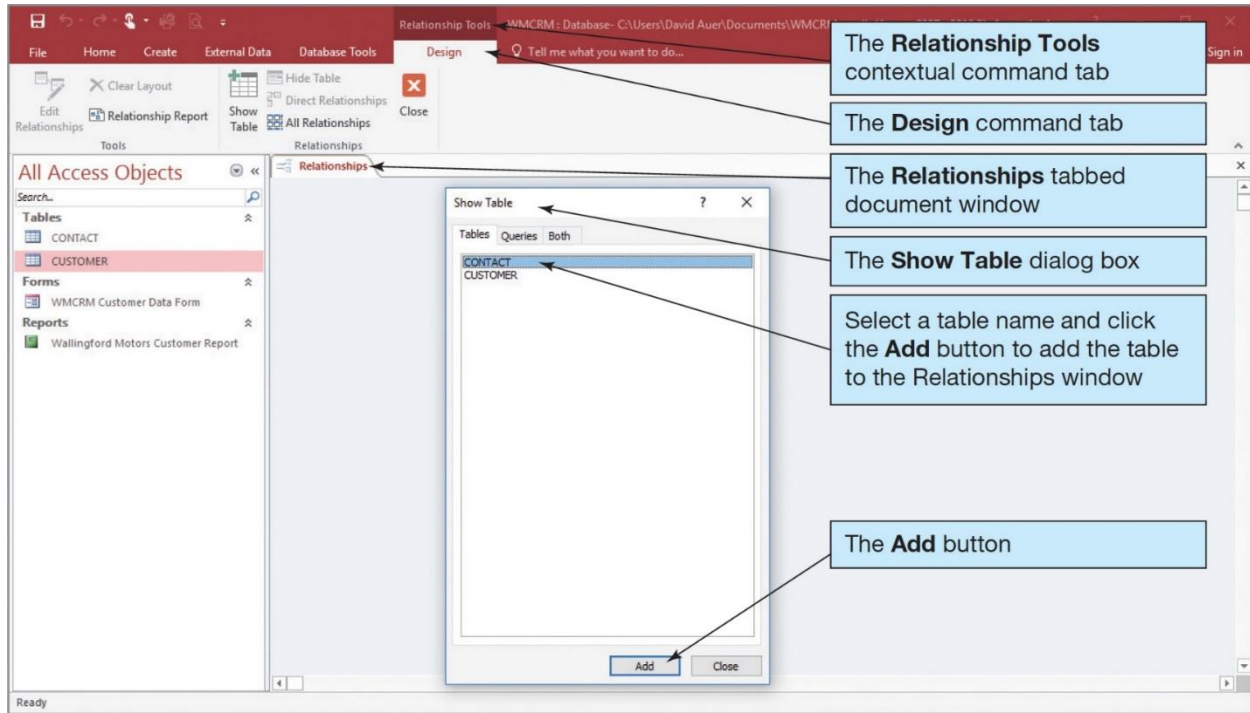
Column Name	Type	Key	Required	Remarks
ContactID	AutoNumber	Primary Key	Yes	Surrogate Key
CustomerID	Number	Foreign Key	Yes	Long Integer
ContactDate	Date/Time	No	Yes	Short Date
ContactType	Short Text (10)	No	Yes	Allowed values are Phone, Fax, Email, and Meeting
Remarks	Long Text	No	No	.

Note: The foreign key setting will be established once we create the relationship between the two tables.

12. Click the Database Tools tab and click relationships

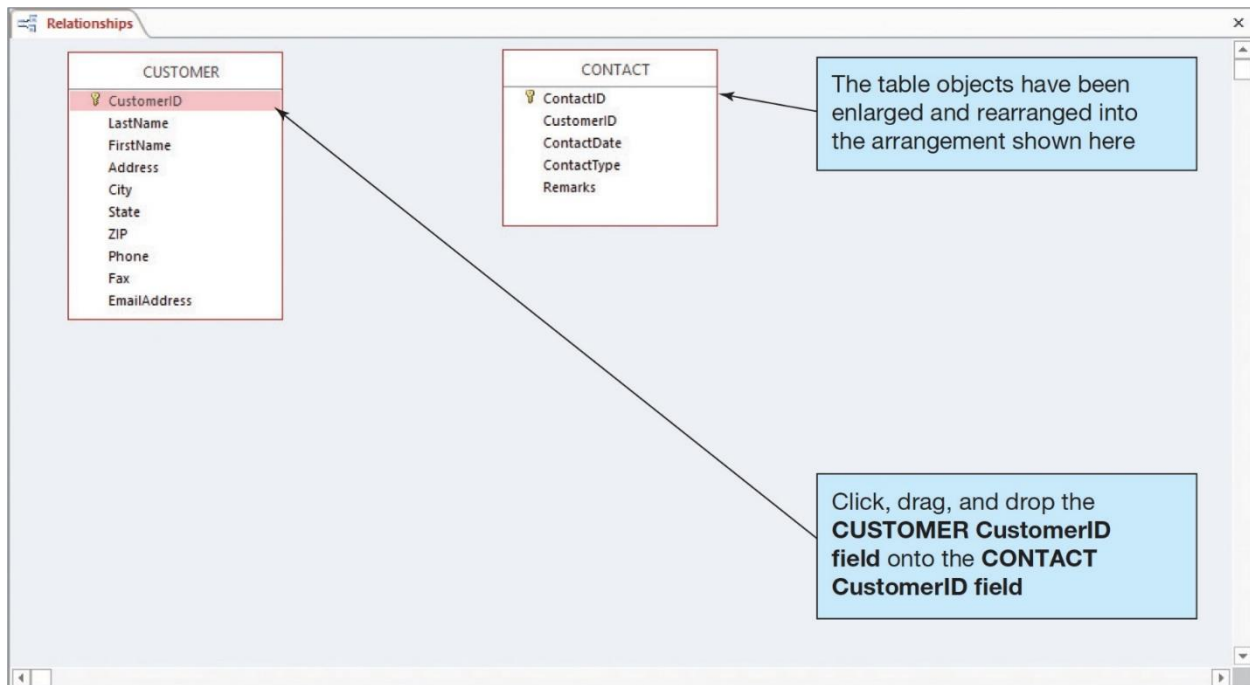Access 2016, Windows 10, Microsoft Corporation.

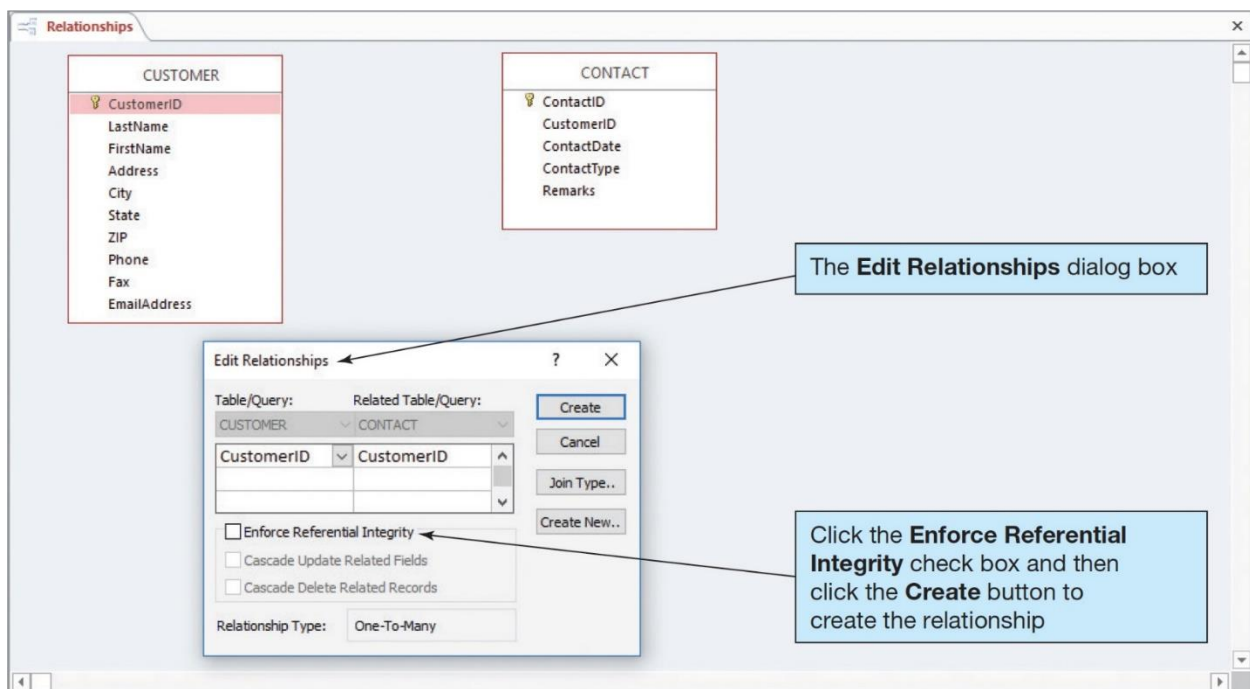13. In the relationship window, add both tables

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14. Rearrange and resize the table objects in the Relationship window using standard drag and drop techniques.

The table objects have been enlarged and rearranged into the arrangement shown here

Click, drag, and drop the **CUSTOMER CustomerID field** onto the **CONTACT CustomerID field**
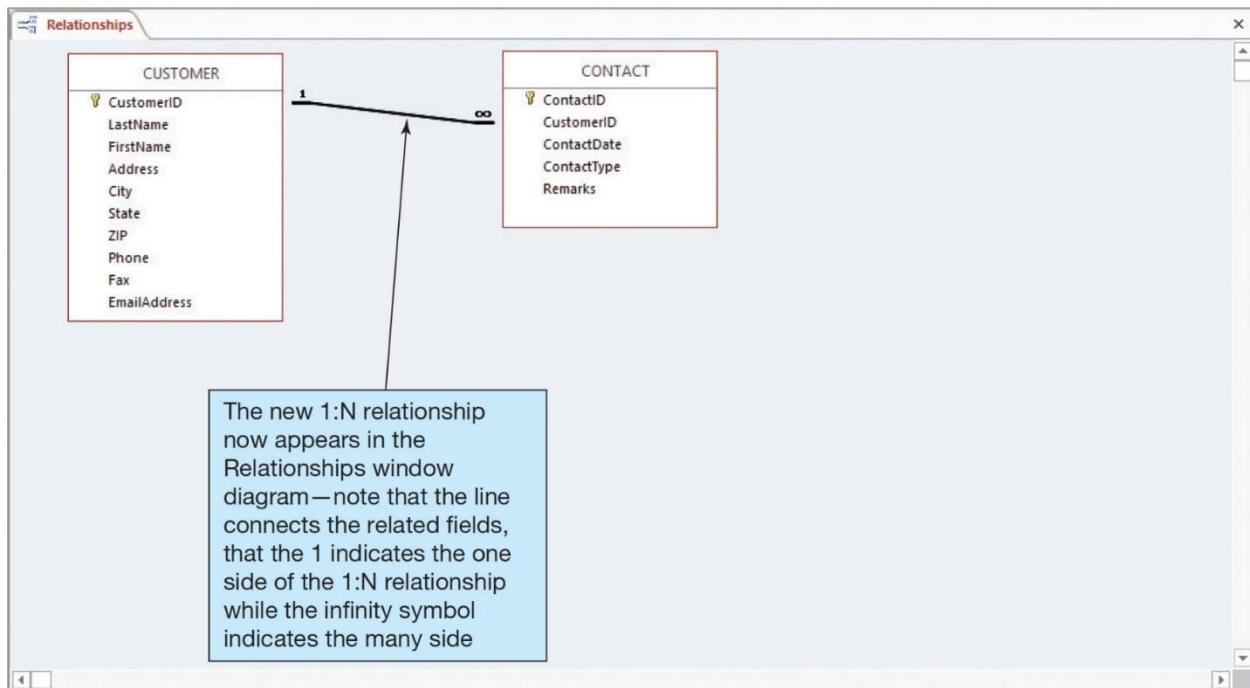
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15. Click and hold the field name CustomerID in the CUSTOMER table and then drag it over the column name CustomerID in the CONTACT table. Release the mouse. The Edit relationship dialog box will appear.

The **Edit Relationships** dialog box

Click the **Enforce Referential Integrity** check box and then click the **Create** button to create the relationship

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16. Click enforce referential integrity.

The new 1:N relationship now appears in the Relationships window diagram—note that the line connects the related fields, that the 1 indicates the one side of the 1:N relationship while the infinity symbol indicates the many side

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17. Now that we have divided the tables, populate the CONTACT table using the data in the CUSTOMER table.

ContactID	CustomerID	ContactDate	ContactType	Remarks
1	1	7/7/2016	Phone	General interest in a Gaea.
2	1	7/7/2016	Email	Sent general information.
3	1	7/12/2016	Phone	Set up an appointment.
4	1	7/14/2016	Meeting	Bought a HiStandard.
5	3	7/19/2016	Phone	Interested in a SUHi, set up an appointment.
6	1	7/21/2016	Email	Sent a standard follow-up message.
7	4	7/27/2016	Phone	Interested in a HiStandard, set up an appointment.
8	3	7/27/2016	Meeting	Bought a SUHi.
9	4	8/2/2016	Meeting	Talked up to a HiLuxury. Customer bought one.
10	3	8/3/2016	Email	Sent a standard follow-up message.
11	4	8/10/2016	Email	Sent a standard follow-up message.
12	5	8/15/2016	Phone	General interest in a Gaea.
(New)	0			

Record: 1 of 12   No Filter   Search

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18. Remove the extra fields in the CUSTOMER table to reflect the normalized relations. Go to Design view of the CUSTOMER table, select the fields, right click and delete.
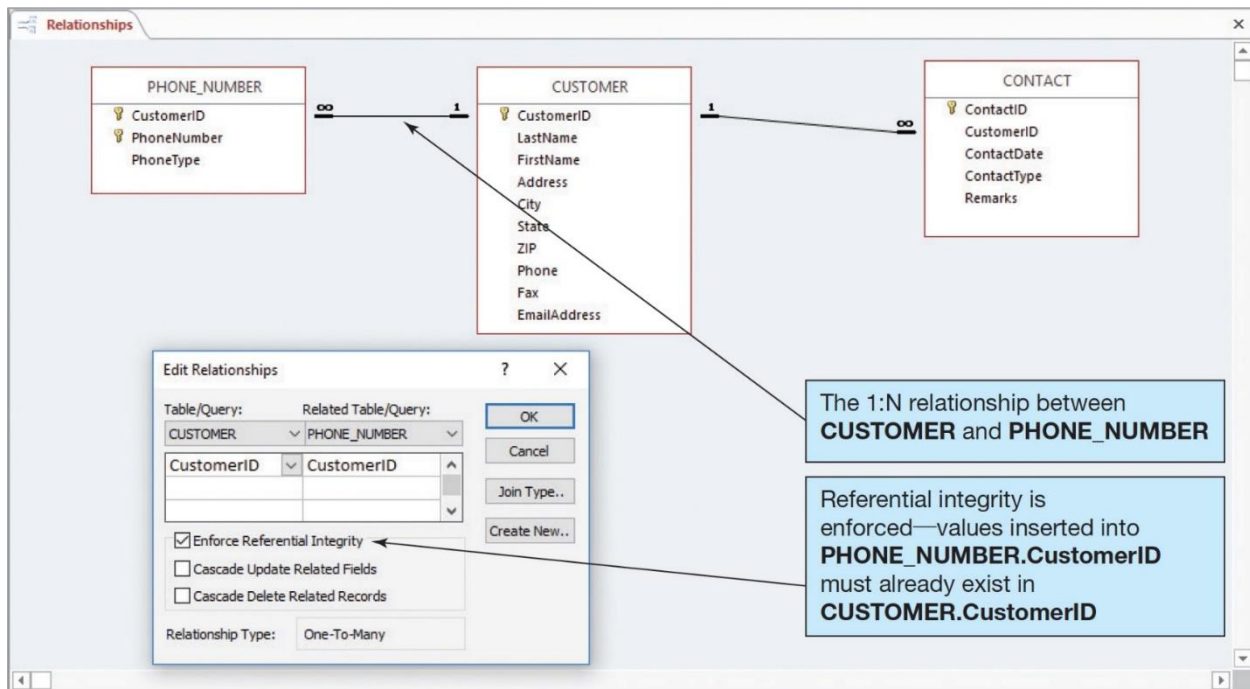
ZIP	Short Text	Customer's ZIP allowing for ZIP 5+4
Phone	Short Text	Customer's phone number including area code
Fax	Short Text	Customer's fax number including area code
EmailAddress	Short Text	Customer's email address
Date	Date/Time	Date of contact
Type	Short Text	Type of contact
Remarks	Long Text	Comments, if any, about the contact

19. What will happen if Ben Giffrey is given a new phone number that does not replace his current one but adds to his set of phone number? This is a case of a multivalue problem. To solve this, we have to create another table just for Phone numbers. Create a new table and name it as PHONE_NUMBER

Column Name	Type	Key	Required	Remarks
CustomerID	Number	Primary Key Foreign Key	Yes	Long Integer
Phone Number	Short Text (12)	Primary Key	Yes	.
Phone Type	Short Text (25)	No	No	.

Note: This table has a composite primary key, hold down CTRL, select the fields and click the primary key button.

20. Go back to relationship window and add the PHONE_NUMBER table. Connect it to the CUSTOMER table.

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21. Add the data to the newly created table.

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