

# Tutorial 9

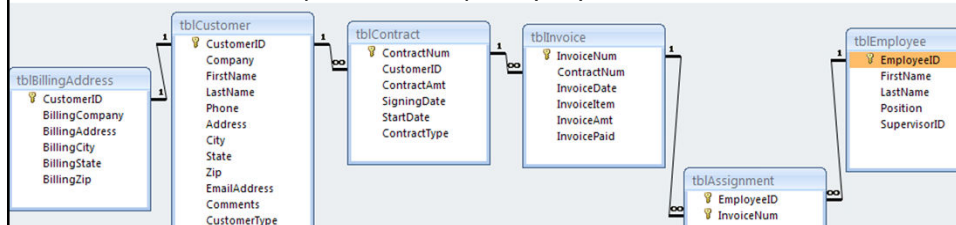
## Advanced Table Relationships

Session 2 only

Review

## Relationships Between Tables

- 1:Many
  - the most common type of inter-table relationship
  - include the primary key from the One table as a foreign key in Many table
- Many:Many
  - use a **junction table** break the Many:Many relationship into two 1:Many relationships
  - junction table includes FKs to match the PK of each outer table
- 1:1
  - a relationship between the primary key of each table



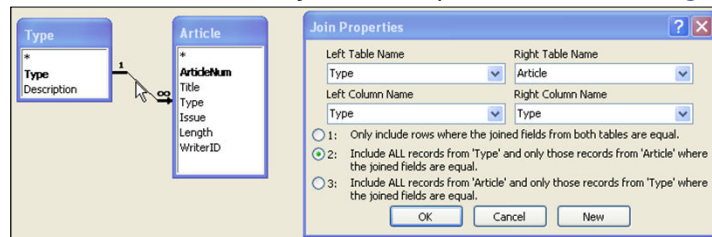
## Inner Join Concepts

- aka Equijoin
- Rows from one table are included in the result set only if there is a matching row in the other table
  - when a row in one table **doesn't match** any rows in the other table, it **won't appear** in the query results
  - the **missing rows** phenomenon
- The default join type
- **Practice Time:**
  - enter a new writer but don't enter any articles for them
  - create a query that displays each writer's first name, last name, & phone number and the title, type & length of each of their articles
  - save as **qryWritersAndArticles (InnerJoin)**
  - note that the new writer was not displayed

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## Outer Join Concepts

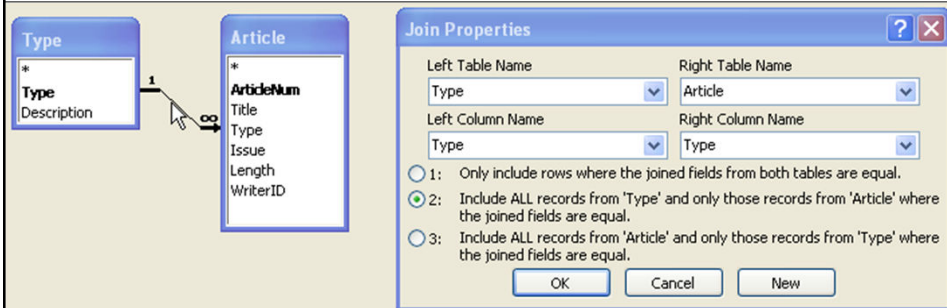
- **Every row** from one table is included in the query result set even if no matching rows exist in the other table
  - rows from each table that do match a row in other table are shown, as usual
- **Driving Table** (nib)
  - the table whose full set of rows is to be selected
- Can be used to track down missing/faulty data by identifying rows in one table that do not match a row in the other
  - the query displays **Null** for fields when no matching row exists in the non-driving table
- **Arrowhead** indicates an outer join & arrow points to the **non-driving** table



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## Setting the Join Type

- Steps to control the join type in an Access query:
  - In query Design View, double-click the join line
  - Select the option corresponding to the join type you want



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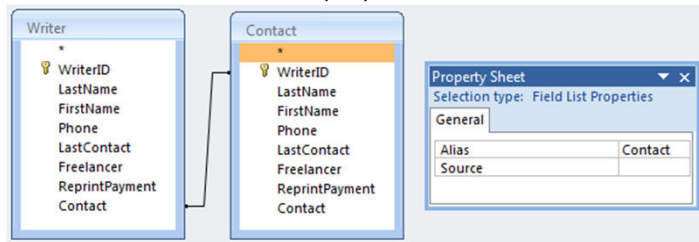
## Practice Time

- Copy `qryWritersAndArticles (InnerJoin)`, save it as `qryAllWritersAndArticles (OuterJoin)`
- Modify to show **every** writer, even those who haven't written any articles. Save `qryAllWritersAndArticles (OuterJoin)` when correct.
  - which writers have no matching articles?
  - which **rows** have Nulls?
  - which **columns** have Nulls?
- Modify the query to show **only** those writers who have not written any articles. Save as `qryWritersWithoutArticles`.
- Create a new query to display title, description, and length, sorted by title. Show all types, even if no articles of that type have been written yet. Save as `qryAllTypesAndArticles`.
- Copy `qryAllTypesAndArticles`, save it as `qryUnwrittenTypes`.
- Modify `qryUnwrittenTypes` to show **only** types that have not been written as articles. Save `qryUnwrittenTypes` when correct.

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## Self Join

- Joins a table to itself
  - when a foreign key matches the primary key values in the **same** table
- Place **two** copies of the table in the Design View
  - can **alias** either table via Property Sheet



- **Practice Time:**
  - create new query show each writer's last name, first name, phone and freelancer status, along with their Contact's last name and phone number.
  - save as **qryWritersAndContacts (SelfJoin)**.

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## Index Concepts

- Analogy: a book's index
  - dramatically speeds up searches
  - occupies space
  - requires updating
- An index indicates how to read a table's records in order of a specified field
  - an object used to efficiently locate rows in a table
- Access automatically creates an index for:
  - each **primary key**
  - each **foreign key** when a relationship is defined
  - (option) fields whose name begins or ends with **ID, key, code, num**
- Access automatically uses indexes when doing so will speed up searching, sorting, joining
  - users don't use indexes **directly**

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**Writer Records as stored on disk**

Record #	Writer ID	Last Name	First Name	Writer Phone	Last Contact	Freelancer	Amount
1	L130	Leavitt	Morris	(810) 270-2927	3/6/95	No	\$0
2	N200	Ngo	Thuy	(706) 636-0046	3/6/95	No	\$0
3	K500	Kim	Chong	(917) 729-5364	5/19/94	No	\$0
4	J525	Johnson	Leroy W.	(210) 895-2046	1/29/91	Yes	\$125
5	C200	Cox	Kelly	(210) 783-5415	11/14/82	Yes	\$100
6	Y556	Yamamura	Shinjiro	(905) 551-1293	9/26/72	No	\$0
7	E235	Epstein	Diane	(610) 349-9689	11/14/79	Yes	\$30
8	N425	Nilsson	Tonya	(909) 702-4082	7/9/77	Yes	\$450
9	K501	Kim	Chong	(710) 116-4683	8/27/88	Yes	\$40
10	C500	Cohen	Julia Rice	(909) 338-1875	2/28/95	No	\$0
11	S260	Seeger	Wilhelm	(706) 423-0932	12/24/93	Yes	\$350
12	W432	Waldeck	Kristine	(917) 361-8181	4/1/86	No	\$0
13	M635	Martinez	Santos	(610) 502-8244	1/18/95	No	\$0
14	H400	Hall	Valerie	(710) 918-7767	9/16/94	No	\$0

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H400	14
J525	4
K500	3
K501	9
L130	1
M635	13
N200	2
N425	8
S260	11
W432	12
Y556	6

**WRITERID index**

allows access to WRITER records in ascending WRITERID order

LastContact	Record #
9/26/72	6
7/9/77	8
11/14/79	7
11/14/82	5
4/1/86	12
8/27/88	9
1/29/91	4
12/24/93	11
5/19/94	3
9/16/94	14
1/18/95	13
2/28/95	10
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15	T500	Trollen	Tom	(480) 423-6265	8/1/2008	No	0

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7	E235	Epstein	Diane	(610) 349-9689	11/14/79	Yes	\$30
8	<del>N425</del>	<del>Nilsson</del>	<del>Toriya</del>	<del>(909) 702-4062</del>	<del>7/9/77</del>	<del>Yes</del>	<del>\$490</del>
9	K501	Kim	Chong	(710) 116-4683	8/27/88	Yes	\$40
10	C500	Cohen	Julia Rice	(909) 338-1875	2/28/95	No	\$0
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# Index Concepts

- Each index is automatically updated as records are
  - inserted
  - updated
  - deleted
- Indexes are stored in the database as **hidden system objects**
- Can have multiple indices for each table
  - cannot index Memo, OLE, Hyperlink, Attachment fields
- Indexes are used to enforce **uniqueness** of field values for
  - 
  -

## Controlling Indexes

- Index Property
  - to control whether or not a selected field is indexed
- Indexes button
  - to view/control all indexes for the current table
  - must be used to create a **composite** index

Article	
Field Name	Data Type
ArticleNum	AutoNumber
Title	Text
Type	Text
Issue	Date/Time

General	
Field Size	Long Integer
New Values	Increment
Format	
Caption	
Indexed	Yes (No Duplicates)
Smart Tags	
Text Align	General

Indexes: tblAssignment		
Index Name	Field Name	Sort Order
PrimaryKey	EmployeeID	Ascending
	InvoiceNum	Ascending

Index Properties	
Primary	Yes
Unique	Yes
Ignore Nulls	No

The name for this index. Each index can contain up to 10 fields.

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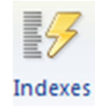
## Practice Time

- The publisher indicates:
  - they frequently search by and sort by title. It is conceivable that articles could have the same title.
  - add SSN to writer table as new field Text(9), and do not allow duplicates. Test to ensure that duplicate values are rejected.

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# Indexes: Pros and Cons



- Pros
  - Indexes can dramatically speed up:
    - 
    - 
    -
- Cons
  - 
  -
- Which fields should you consider indexing?