Week 7 - Lab 1: Multi-table queries, Aggregate Qureies

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Overview

- In this tutorial, we will learn how to create:
  - Table Relationships
  - Multi-table Queries
  - Aggregate Queries

Example Files

- Get the Example files from the lab manual:
  - http://wiki.ucalgary.ca/page/Courses/Computer_Science/CPSC_203/CPSC_203_Template/Labs_Template/Week_2_-_Lab_2:_Multi-table_queries,_Aggregate_Qureies

Relationships

- Relationships are links that associate a field in one table with a field in another table.

Students	
Student Name	**Address**
John	Elm St.
Jane	Oak St.

Math Class	
Student Name	**Grade**
John	A
Jane	B

Relationships are important if we want to be able perform queries with multiple tables

Students		Math Class	
Student Name	Address	Student Name	Grade
John	Elm St.	**John**	A
Jane	Oak St.	Jane	B

Both tables share a common field, the Student Name field. By linking the Student Name fields, you ensure that John in the Students table is the same John listed in the the Math Class table

Relationships Example

- Create a new database with these three tables
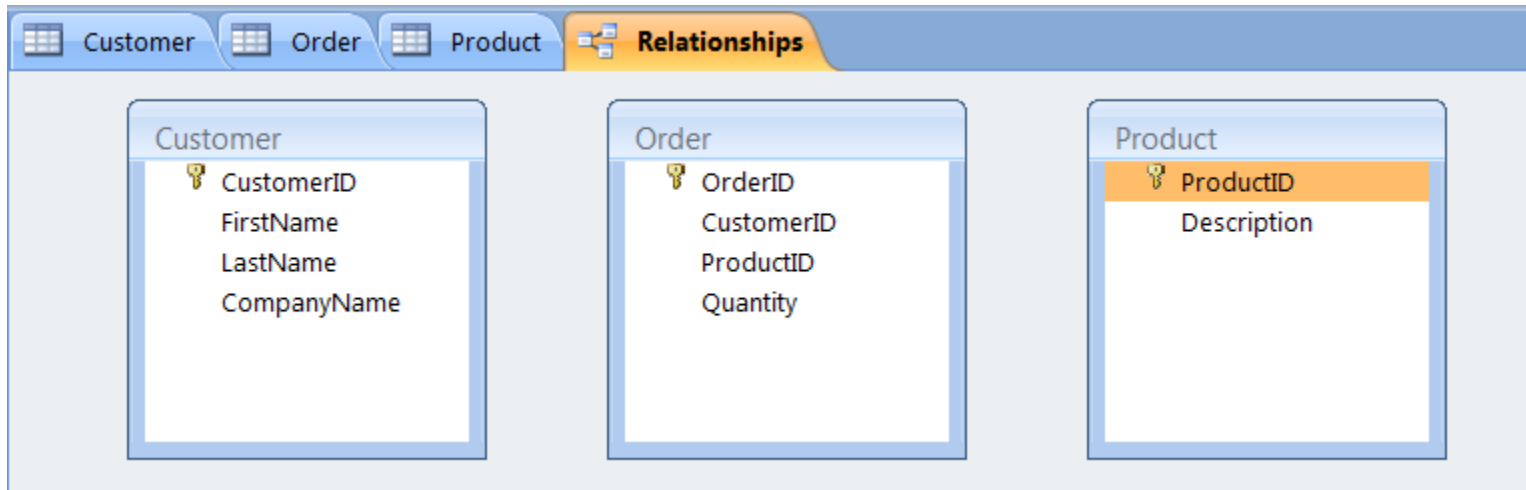
Relationships Example

Relationships Example

Press Ctrl and click on the three table names to select them all, then press the Add button.

When the tables are added, close the Show Table dialog.

Relationships Example

First we need to determine which fields tables have in common.

Order.CustomerID → Customer.CustomerID

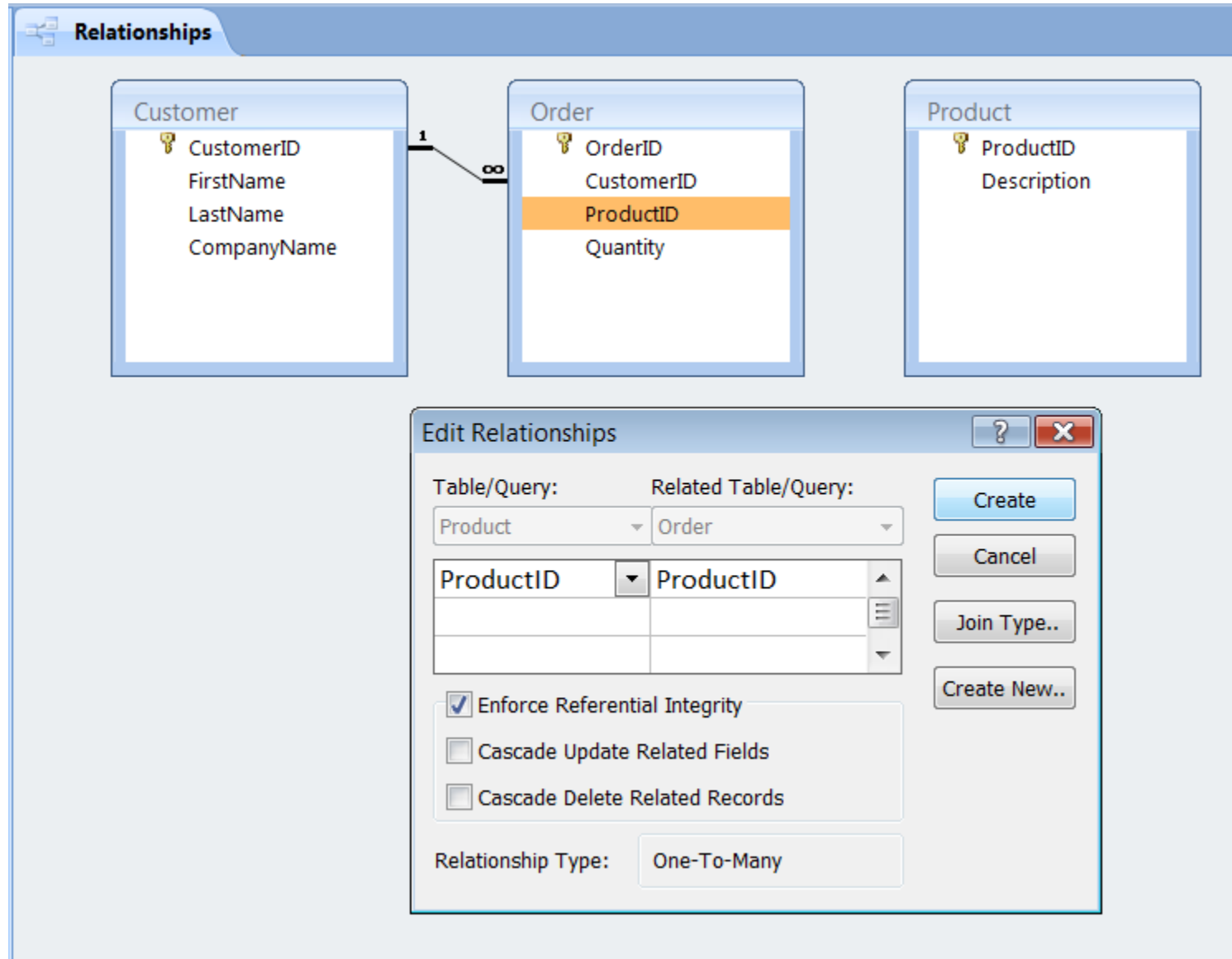Order.ProductID → Product.ProductID

Relationships Example

Relationships Example

Relationships Example

Multi-table Queries

- Use the access database provided named "W08_BookExampleWQueries_20080228.mdb".

Tables	
▦	bktblAuthors
▦	bktblPublishers
▦	**bktblTitles**
▦	tblDatabaseSkills
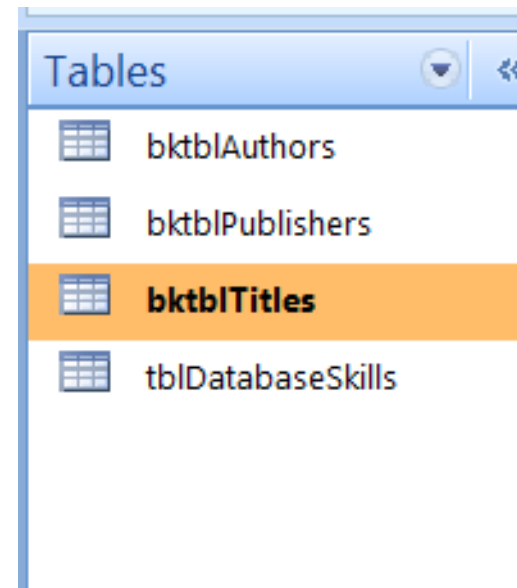
Multi-table Queries
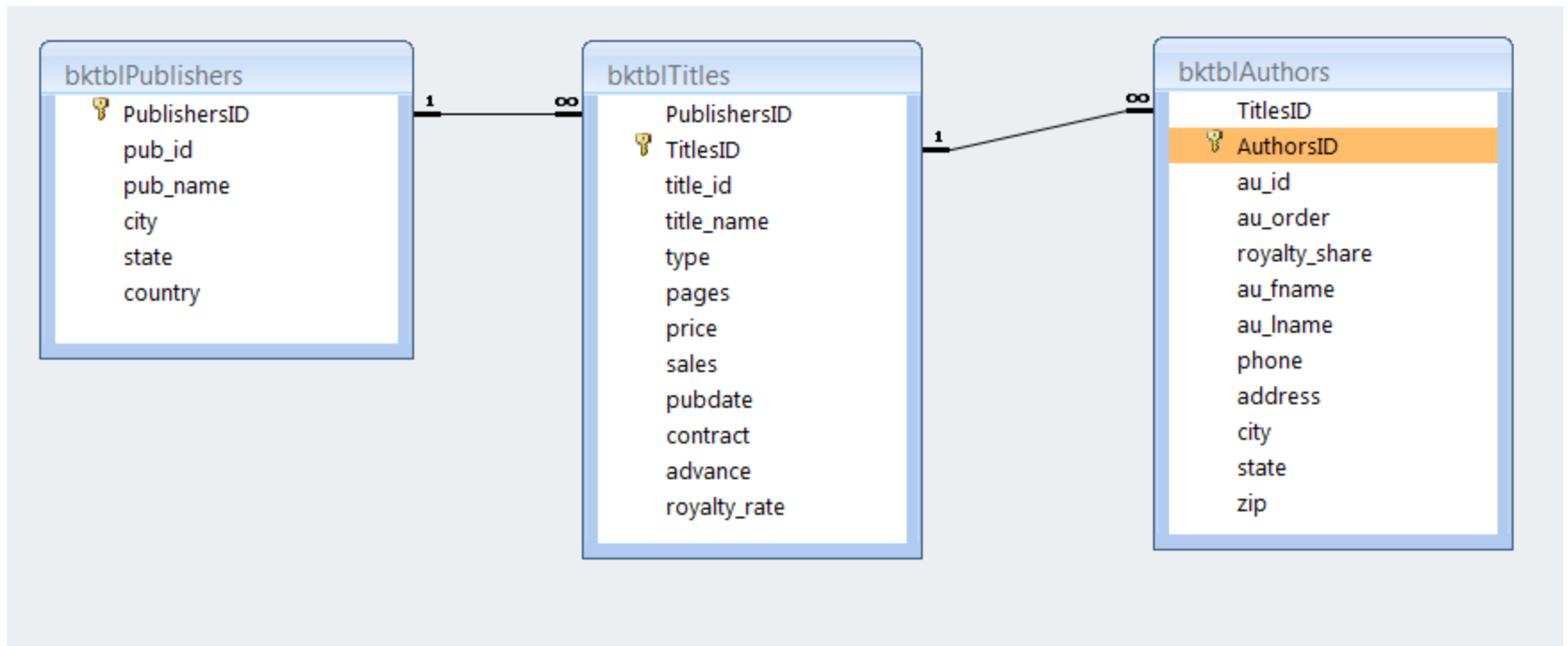
Multi-table Queries

- We will see a small set of basic query patterns.
- Complicated patterns of data analysis can be created by linking together sequential simple queries.
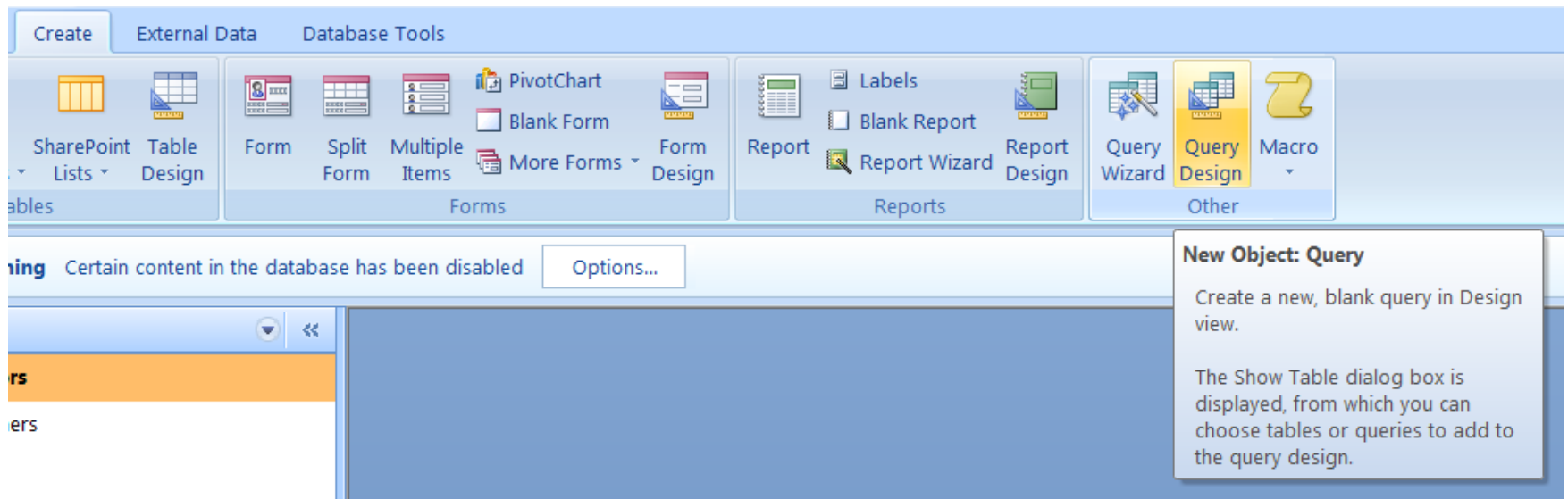
Query 1

Give me ALL the data in a table.

This query retrieves all data from a single table and displays the information.

PATTERN:

SELECT * FROM TableName;
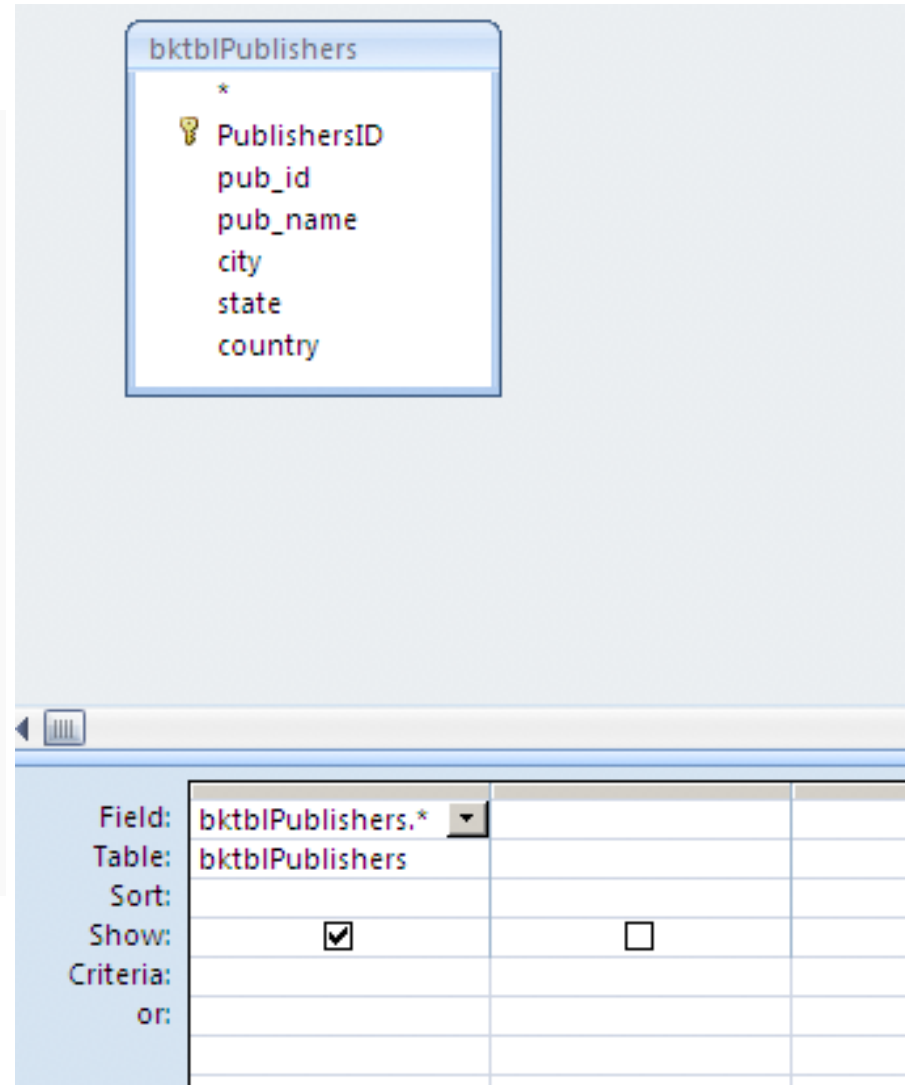
Query 1

Result:

PublishersID	pub_id	pub_name	city	state	country
1	P01	Abatis Publishe	New York	NY	USA
2	P02	Core Dump Bo	San Francisco	CA	USA
3	P03	Schadenfreude	Hamburg		Germany
4	P04	Tenterhooks P	Berkeley	CA	USA
* (New)					

Query 2

Give me ALL the data across SEVERAL tables

PATTERN:

SELECT * FROM TableName1, TableName2 ….. TableNameN
WHERE(Table1.Pkey = Table2.Fkey) ….
And (TableNameN-1.Pkey = TableNameN.Fkey) ;

Query 2

Relationships have to be defined before creating the query.

Query 2

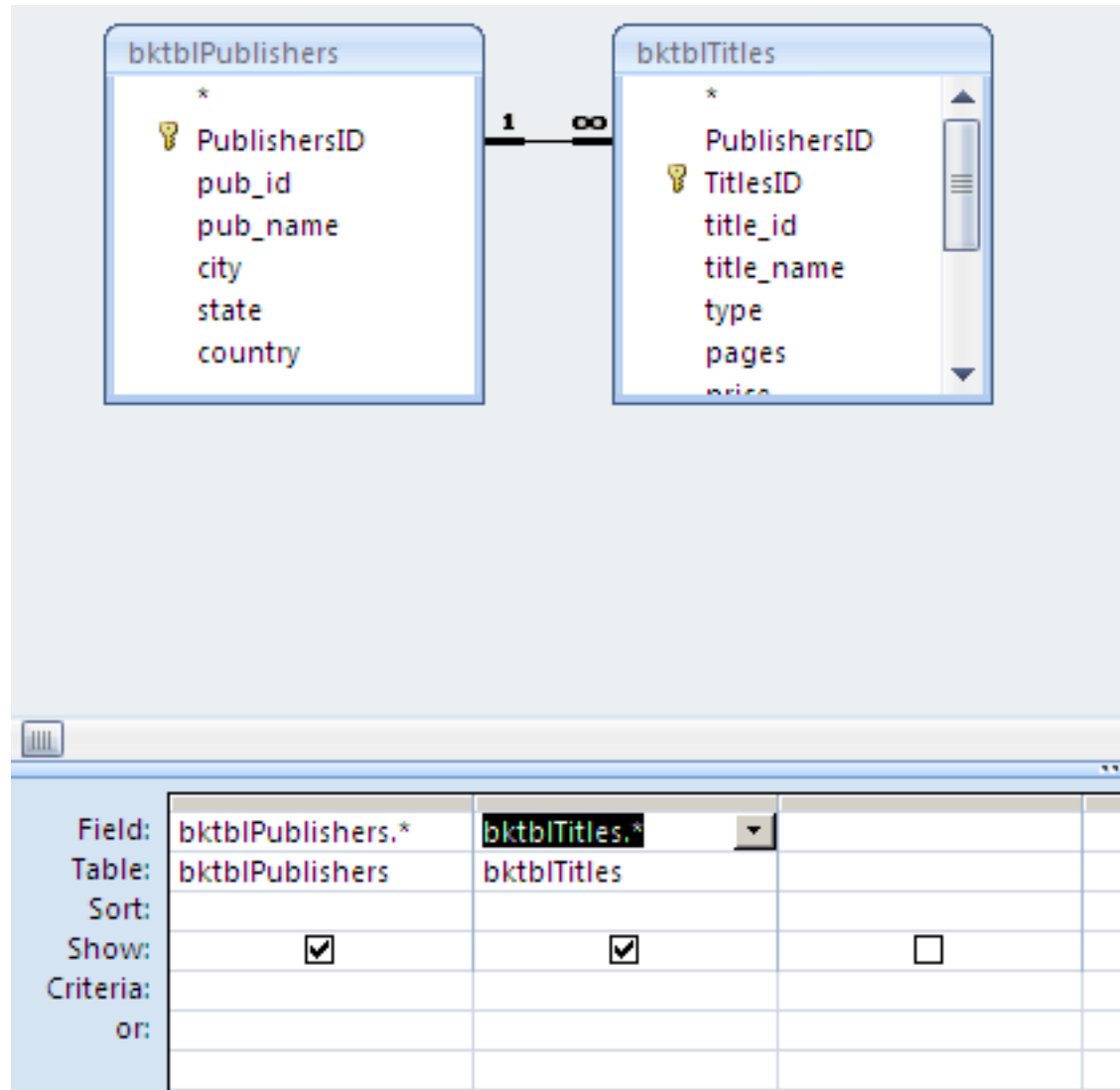| bktblPublish	pub_id	pub_name	city	state	country	bktblTitles.F	TitlesID	title_id
1	P01	Abatis Publishe	New York	NY	USA	1	1	T01
1	P01	Abatis Publishe	New York	NY	USA	1	2	T04
1	P01	Abatis Publishe	New York	NY	USA	1	3	T05
1	P01	Abatis Publishe	New York	NY	USA	1	4	T06
1	P01	Abatis Publishe	New York	NY	USA	1	5	T08
1	P01	Abatis Publishe	New York	NY	USA	1	6	T09
1	P01	Abatis Publishe	New York	NY	USA	1	7	T10
1	P01	Abatis Publishe	New York	NY	USA	1	8	T11
1	P01	Abatis Publishe	New York	NY	USA	1	9	T12
2	P02	Core Dump Bo	San Francisco	CA	USA	2	10	T03
3	P03	Schadenfreude	Hamburg		Germany	3	11	T02
3	P03	Schadenfreude	Hamburg		Germany	3	12	T07
3	P03	Schadenfreude	Hamburg		Germany	3	13	T13
*	(New)						(New)	

Query 3

Give Me Selected fields from Several Tables

PATTERN:

SELECT TableNamei.FieldNamej, TableNamep.FieldNameq ….
FROM TableNamei, TableNamep …
WHERE(TablNamei.Pkey = TableNamep.Fkey) ….
AND (…) … ; bleNameN.Fkey) ;

Query 3
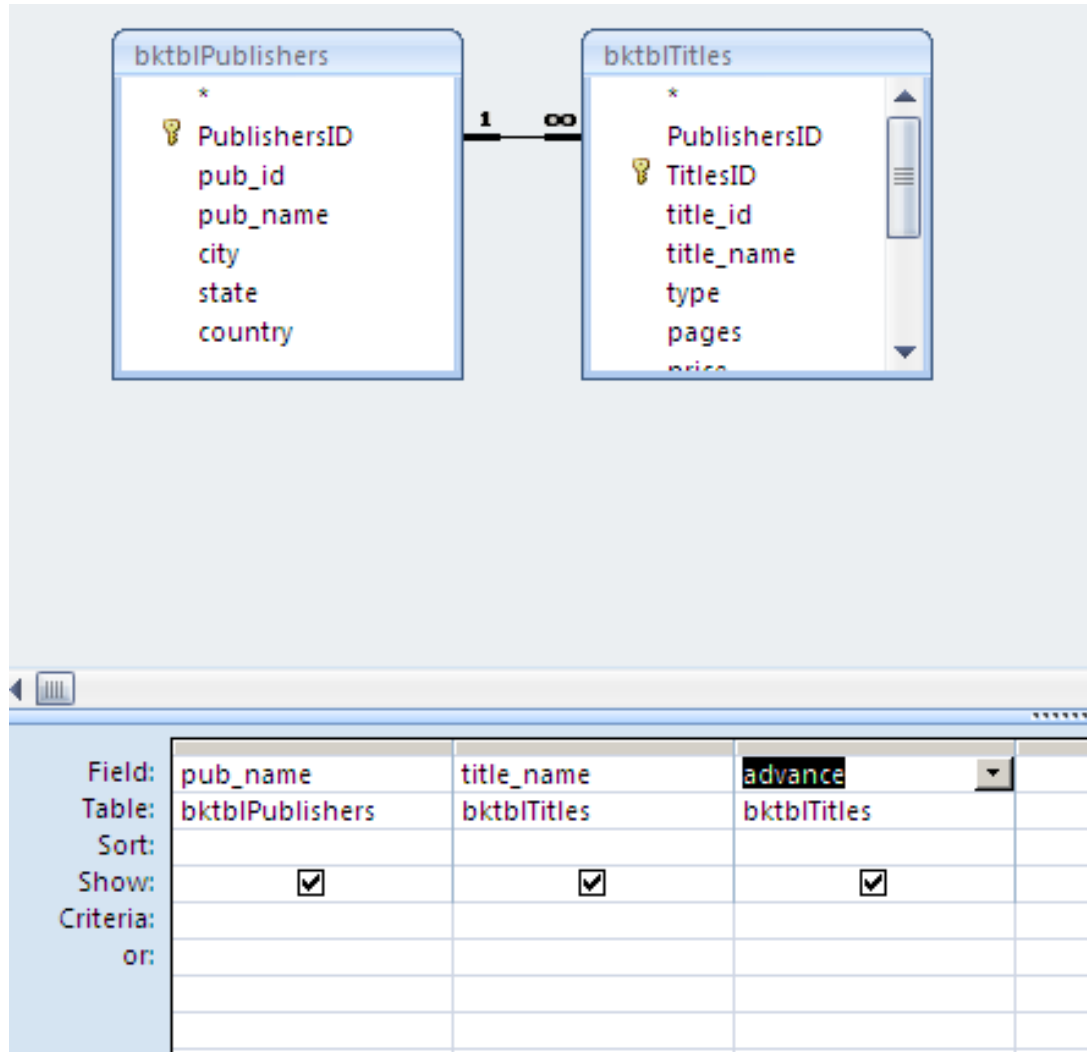
Query 3

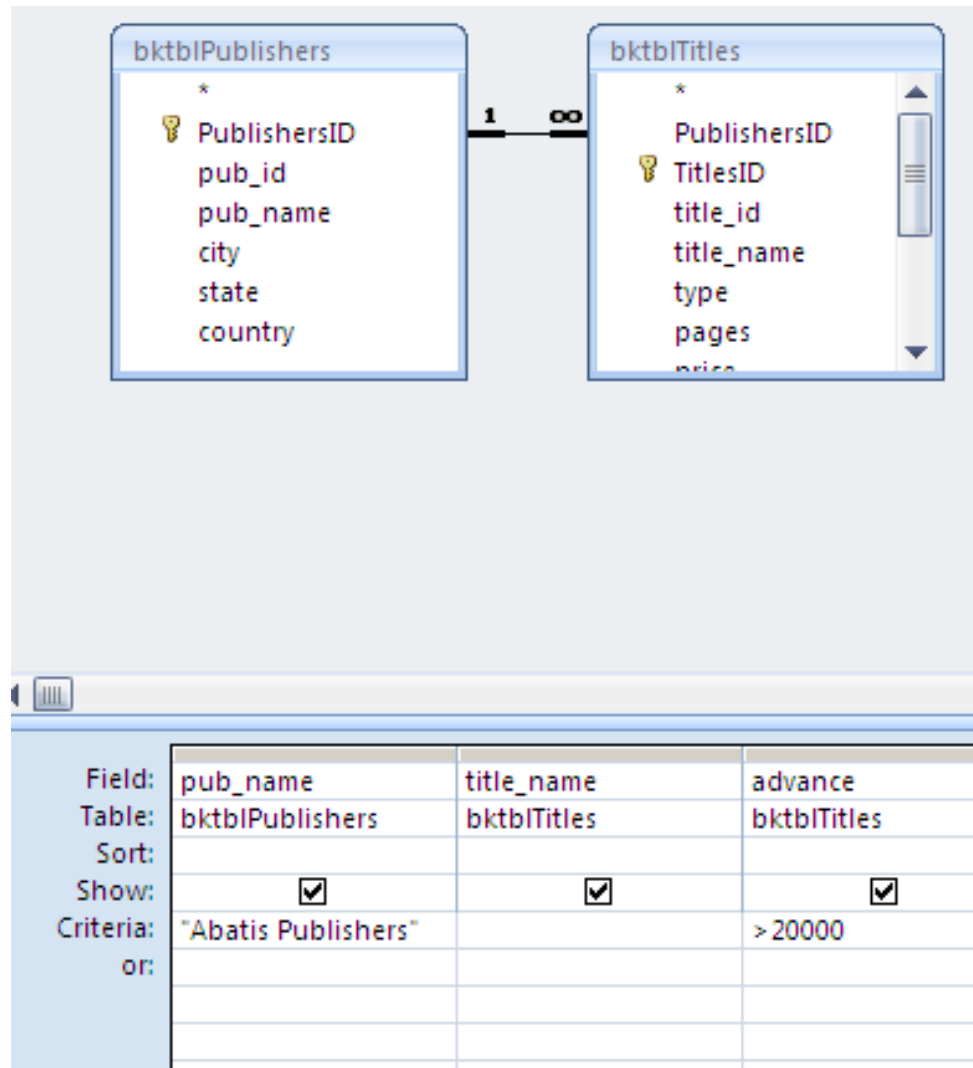| pub_name	title_name	advance
Abatis Publishers	1977!	10000
Abatis Publishers	But I Did It Unconsciously	20000
Abatis Publishers	Exchange of Platitudes	100000
Abatis Publishers	How About Never?	20000
Abatis Publishers	Just Wait Until After School	0
Abatis Publishers	Kiss My Boo-Boo	0
Abatis Publishers	Not Without My Faberge Egg	
Abatis Publishers	Perhaps It's a Glandular Problem	100000
Abatis Publishers	Spontaneous, Not Annoying	50000
Core Dump Books	Ask Your System Administrator	15000
Schadenfreude Press	200 Years of German Humor	1000
Schadenfreude Press	I Blame My Mother	1000000
Schadenfreude Press	What Are The Civilian Applications	20000

Query 4

Give me Selected fields from Several Tables with Constraints
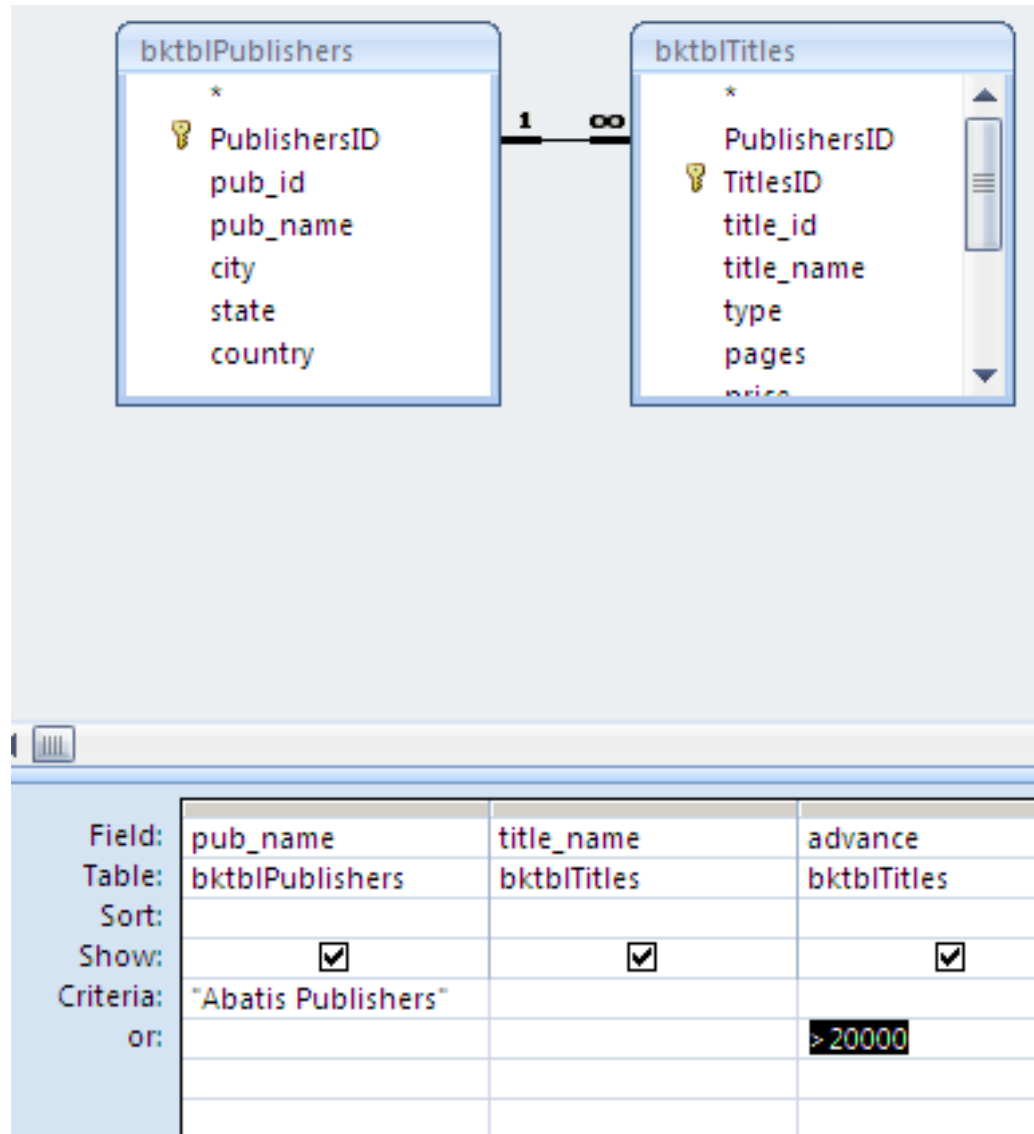
Using the logical AND constraint.

AND PATTERN:

SELECT TableNamei.FieldNamej, TableNamep.FieldNameq ....
FROM TableNamei, Tablenamep …
WHERE (Tablei.Pkey = Tablep.Fkey) ….
AND TableNamei.FieldNamej = "VALUE1" AND …
TableNamep.FieldNameq = "Value2" ;

Query 4

Query 4

pub_name	title_name	advance
Abatis Publishers	Exchange of Platitudes	100000
Abatis Publishers	Perhaps It's a Glandular Problem	100000
Abatis Publishers	Spontaneous, Not Annoying	50000

Query 4

Using the logical OR constraint.

OR PATTERN:

SELECT TableNamei.FieldNamej, TableNamep.FieldNameq ….
FROM TableNamei, Tablenamep …
WHERE (Tablei.Pkey = Tablep.Fkey) ….
AND TableNamei.FieldNamej = "Value1"
OR TableNamep.FieldNameq = "Value2" ;

Query 4

	pub_name	title_name	advance
Field:	pub_name	title_name	advance
Table:	bktblPublishers	bktblTitles	bktblTitles
Sort:			
Show:	☑	☑	☑
Criteria:	"Abatis Publishers"		
or:			>20000

Query 4

pub_name	title_name	advance
Abatis Publishers	1977!	10000
Abatis Publishers	But I Did It Unconsciously	20000
Abatis Publishers	Exchange of Platitudes	100000
Abatis Publishers	How About Never?	20000
Abatis Publishers	Just Wait Until After School	0
Abatis Publishers	Kiss My Boo-Boo	0
Abatis Publishers	Not Without My Faberge Egg	
Abatis Publishers	Perhaps It's a Glandular Problem	100000
Abatis Publishers	Spontaneous, Not Annoying	50000
Schadenfreude Press	I Blame My Mother	1000000

Query 5

Give Me Selected Fields from Several Tables with Custom Calculations

For example, determining sales profits based on the information retrieved such as: book title sales, book price, book advance, and book royalty rate.

PATTERN:

SELECT TableNamei.FieldNamej, TableNamep.FieldNameq …. ,
CalcField =TableNamei.Fieldnamej <operator>
TableNameP.Fieldnameq <operator> ….
FROM TableNamei, Tablenamep …
WHERE (TableNamei.Pkey = TableNamep.Fkey) …. ;

Query 5

Query 5

pub_name	title_name	advance	sales	price	royalty_rate	sales_profit:
Abatis Publishers	1977!	10000	566	21.99	0.05	2324.023
Abatis Publishers	But I Did It Unconsciously	20000	13001	12.99	0.08	136972.3508
Abatis Publishers	Exchange of Platitudes	100000	201440	6.95	0.09	1183007.28
Abatis Publishers	How About Never?	20000	11320	19.95	0.08	189367.28
Abatis Publishers	Just Wait Until After School	0	4095	10	0.04	39312
Abatis Publishers	Kiss My Boo-Boo	0	5000	13.95	0.05	66262.5
Abatis Publishers	Not Without My Faberge Egg					
Abatis Publishers	Perhaps It's a Glandular Problem	100000	94123	7.99	0.07	606399.7761
Abatis Publishers	Spontaneous, Not Annoying	50000	100001	12.99	0.09	1136601.8209
Core Dump Books	Ask Your System Administrator	15000	25667	39.95	0.07	939668.8845
Schadenfreude Press	200 Years of German Humor	1000	9566	19.95	0.06	178451.198
Schadenfreude Press	I Blame My Mother	1000000	1500200	23.95	0.11	31087513.1
Schadenfreude Press	What Are The Civilian Applications	20000	10467	29.99	0.06	276271.0102

Query 6

Give me Aggregate queries using selected fields from several tables

For example, this query will obtain all book publishers and performs an average calculation to determine what each book publisher's average is for giving an advance to book authors.

PATTERN:

SELECT TableNamei.FieldNamej,
StatFunction(TableNamep.FieldNameq) As StatFieldnameq ….
FROM TableNamei, Tablenamep …
WHERE(TableNamei.Pkey = TableNamep.Fkey) ….
GROUPBY TableNamei.FieldNamej ;

Query 6

Query 7

Give me Aggregate queries using selected fields from several tables with Constraints on the Groups Shown

Same as query (six), however with some constraints using logical AND as well as logical OR operations.

AND PATTERN:
SELECT TableNamei.FieldNamej,
StatFunction(TableNamep.FieldNameq) As StatFieldnameq ….
FROM TableNamei, Tablenamep …
WHERE(TableNamei.Pkey = TableNamep.Fkey) ….
GROUPBY TableNamei.FieldNamej
HAVING TableNamei.FieldNamej = "Value1"
AND … TableNamep.FieldNameq = "Value2";

Query 7

Query 7

OR PATTERN:

SELECT TableNamei.FieldNamej,
StatFunction(TableNamep.FieldNameq) As StatFieldnameq ....
FROM TableNamei, Tablenamep ...
WHERE(TableNamei.Pkey = TableNamep.Fkey) ....
GROUPBY TableNamei.FieldNamej
HAVING TableNamei.FieldNamej = "Value1"
OR ... TableNamep.FieldNameq = "Value2";

Query 7