DATABASE

EGCO342 INFORMATION TECHNOLOGY IN DAILY LIFE

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Why do we need Database? (1)

- You want to store your employee phone numbers.
- What will you do?
- What if?
  - You have a company with 100000+ employees across the globe.
  - You want to add these information
  - Job name
  - Job description
  - Min/max salary for the job
  - Working location
  - Location telephone

Why do we need Database? (2)

- When we have more complicate question to ask.
- When there are a lot of information and there are many duplicate information.

Types of Database

- Three Types of Database
  - Relational
  - Object-oriented
  - Multidimensional
- Relational databases is most common

BIG Players

- IBM
  - DB2
- Oracle
  - Oracle DB = Leading in the Market.
  - MySQL = Free
- SAP
- Microsoft
  - Access = Personal/Small Data.
  - Microsoft SQL Server = Enterprise/Big Data.

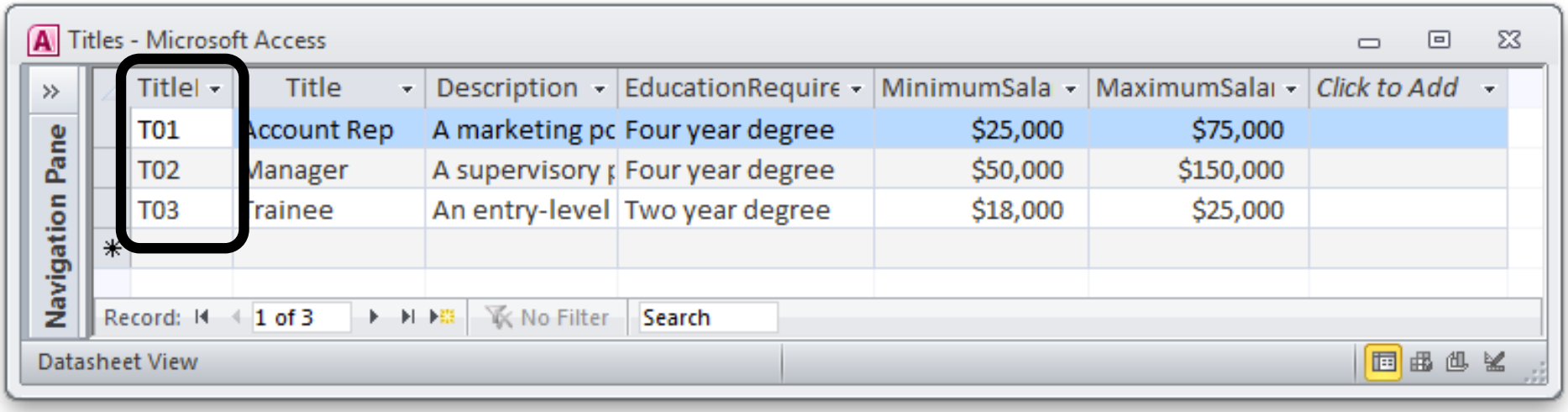
Relational Databases

- Data in tables
- Define relation between tables.
- Primary key is unique for each record (row)

Database Terminologies

- Databases have three main components;
  - Fields
    - Store each category of information
    - Displayed in columns
  - Records
    - Group of related fields
  - Tables (or files)
    - Group of related records

Field (Column)



Record (Row)

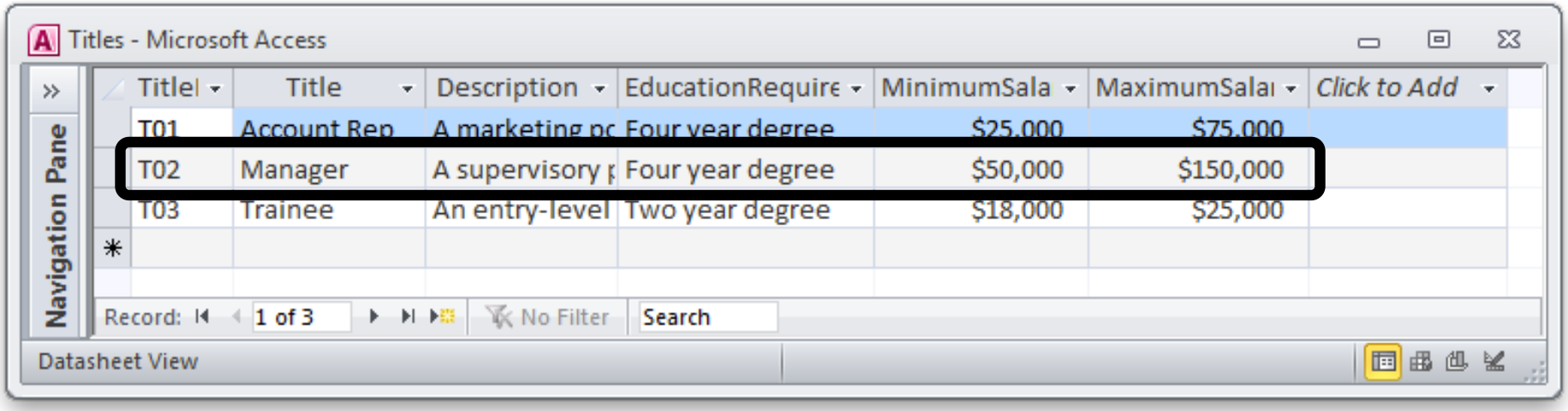
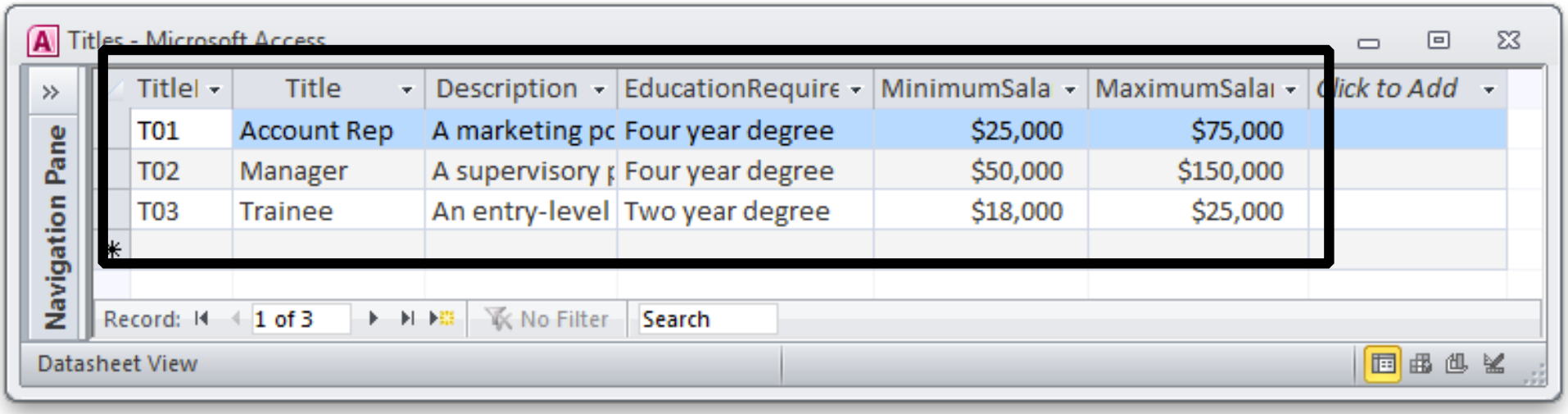

Titles - Microsoft Access
Navigation Pane
TitleI
Title
Description
EducationRequire
MinimumSala
MaximumSalai
Click to Add
T01
Account Rep
A marketing pc
Four year degree
$25,000
$75,000
T02
Manager
A supervisory p
Four year degree
$50,000
$150,000
T03
Trainee
An entry-level
Two year degree
$18,000
$25,000
Record:
1 of 3
No Filter
Search
Datasheet View

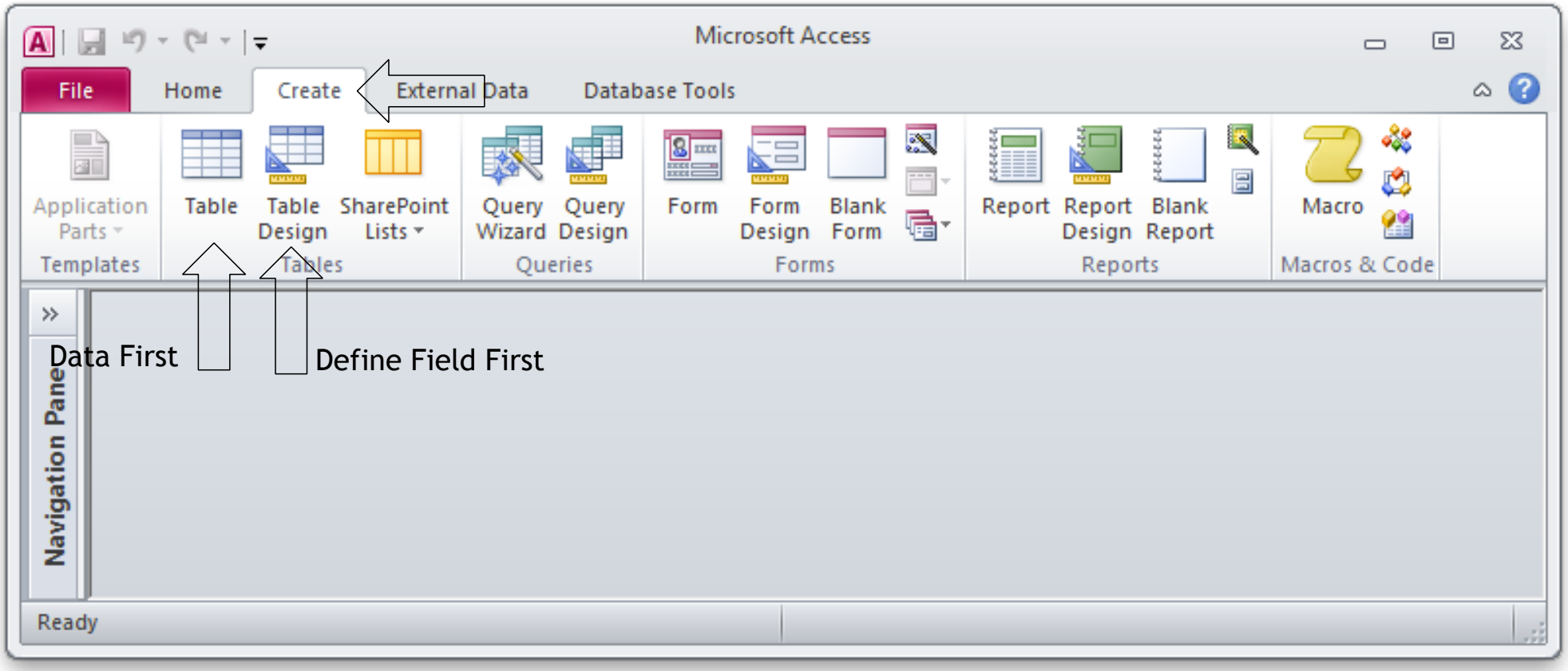
Table (Entity)



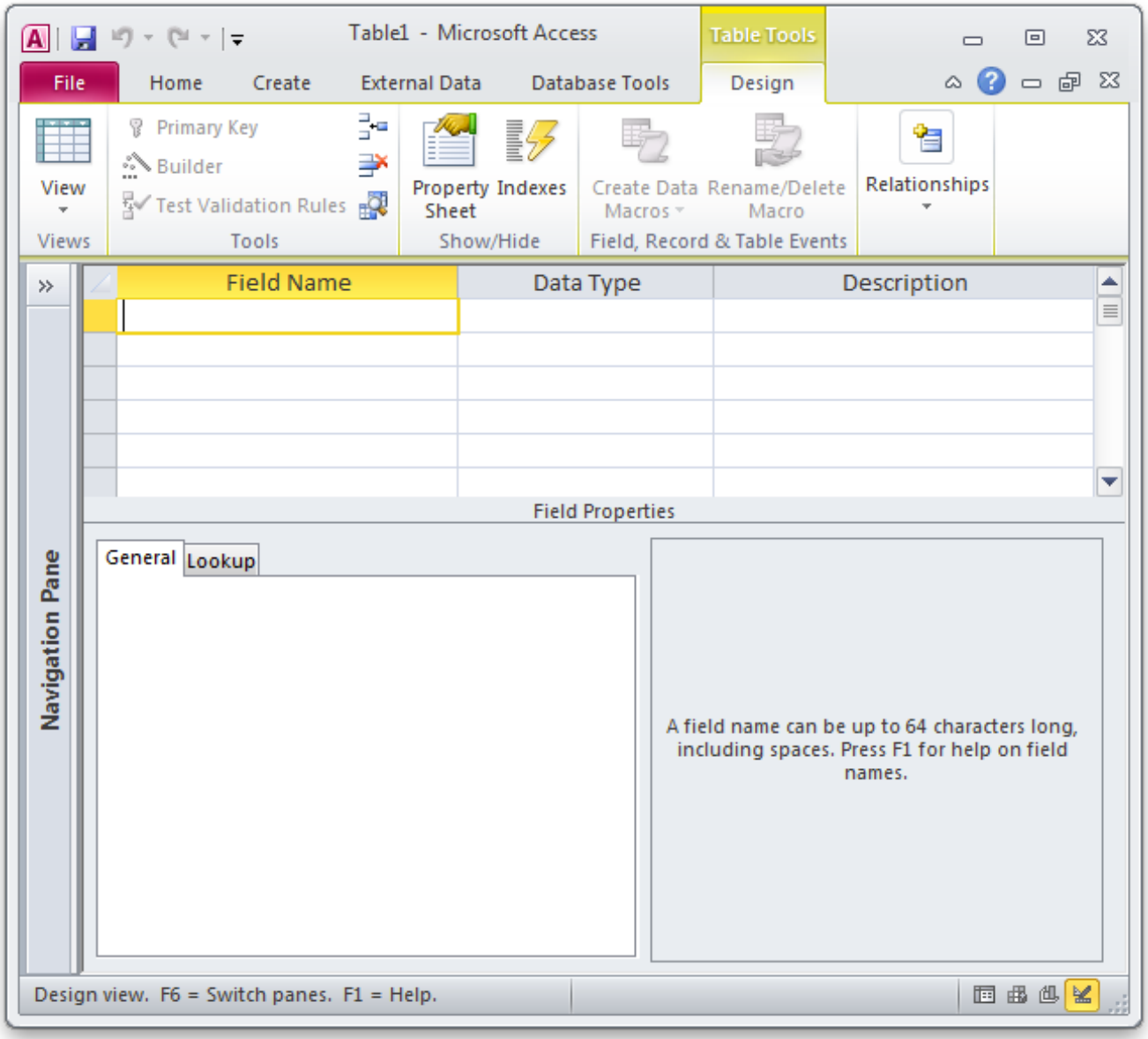
Create Table

- Data First
- Define Field First

New Table


Microsoft Access
File
Home
Create
External Data
Database Tools
Application Parts
Templates
Table
Table Design
SharePoint Lists
Tables
Query Wizard
Query Design
Queries
Form
Form Design
Blank Form
Forms
Report
Report Design
Blank Report
Reports
Macro
Macros & Code
Navigation Pane
Data First
Define Field First
Ready

Define Field



Common Data Types

Data Type	Used to Store	Examples
Text	Short text with maximum length limit	*John Doe*
Number	Numbers	*2901 or 3.499*
Yes/No	Boolean	*False/True or 0/1*
Date & Time	Dates	*2/21/2016*
Memo	Long text with no limit	*I want to finish this exercise so I can go home.*
Calculated	Formula	*Grade * Credit*
Attachment	Files	*Document, Picture*
Hyperlink	Hyperlink to a Web page	*Google.com*

Filed Size

- Set field size to save space
- Too small size = missing data
- Will all names fit in 10 characters?
- Will addresses fit in 20 characters?

Data First

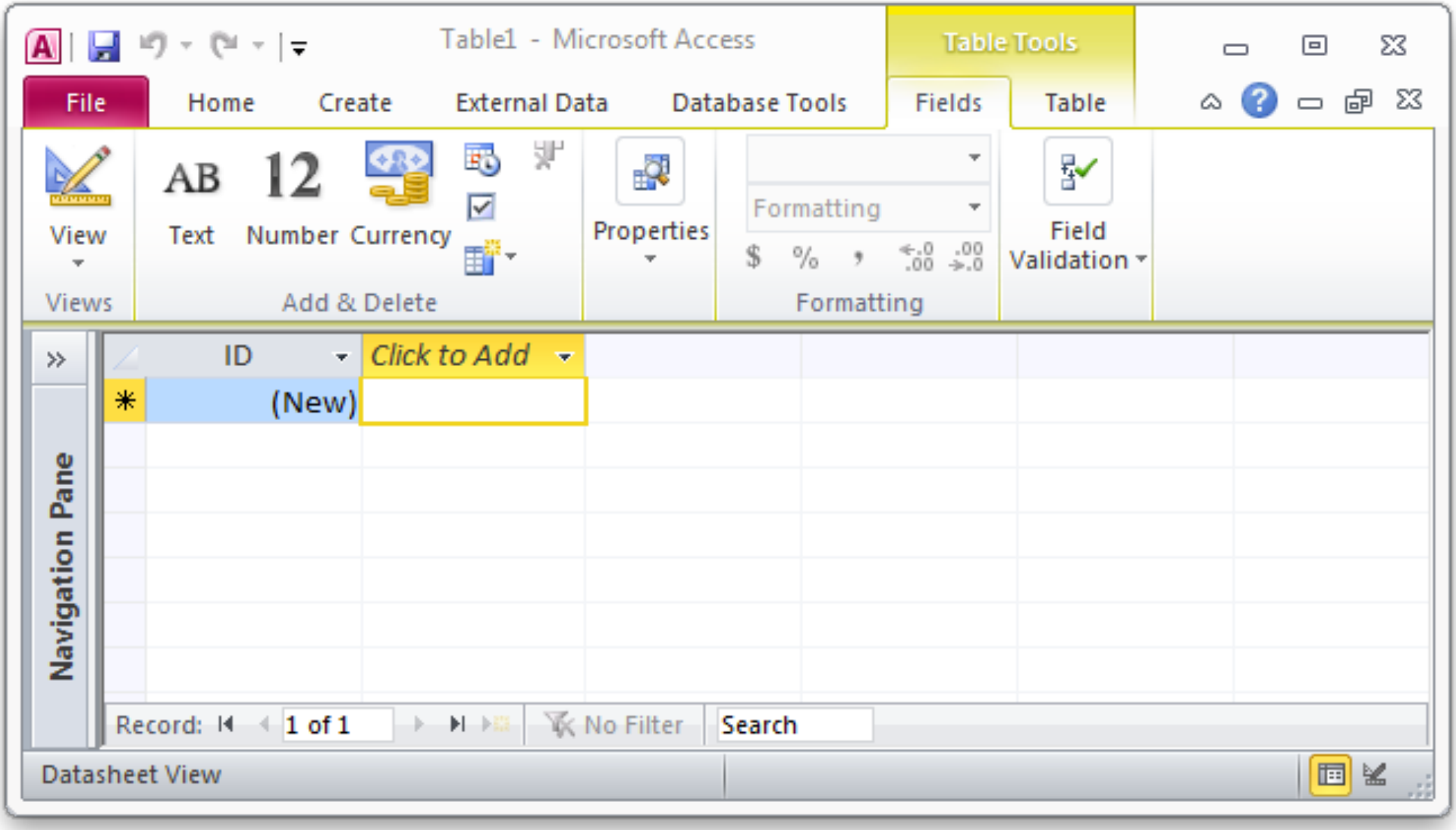
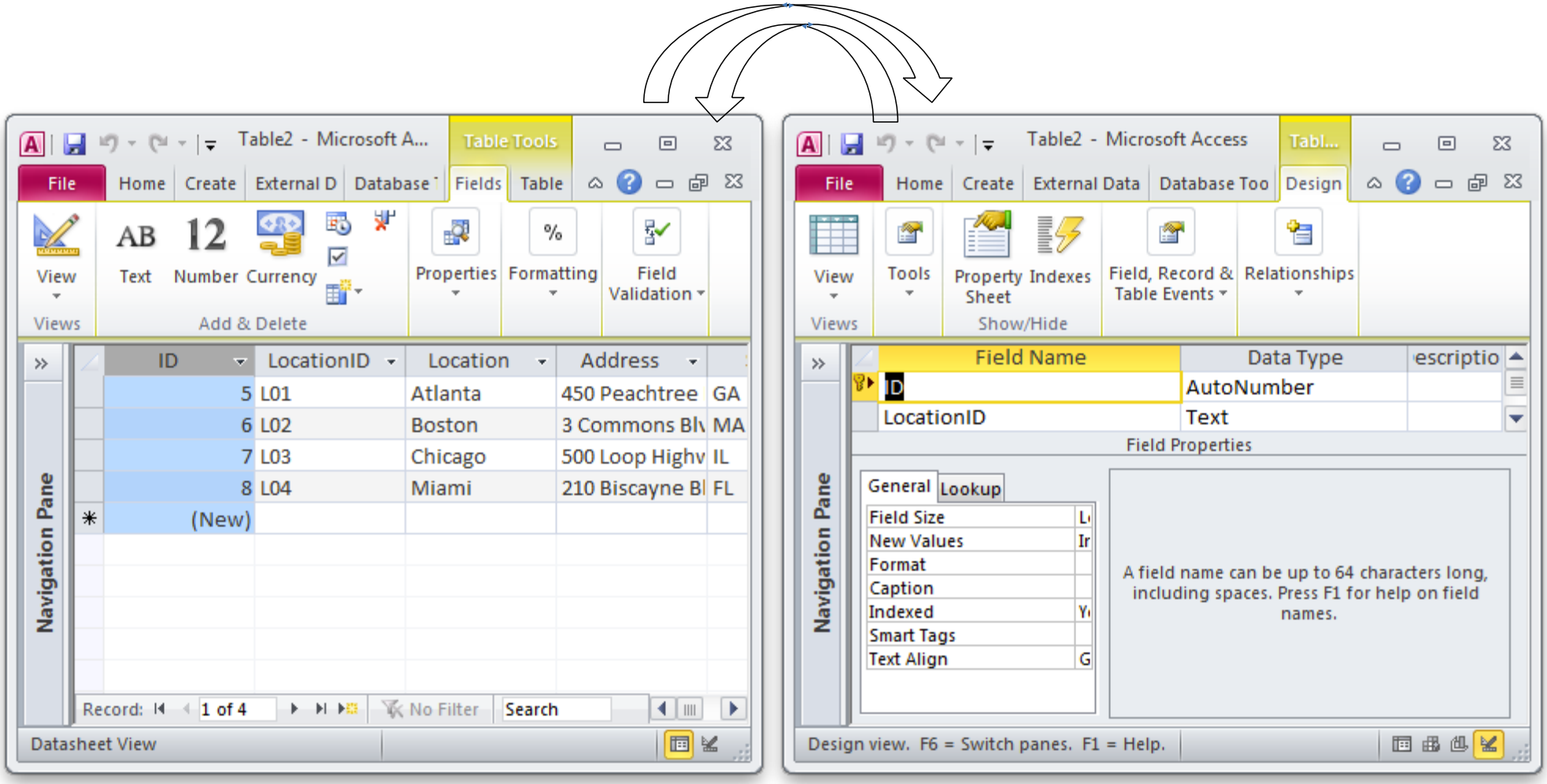


Table1 - Microsoft Access
Table Tools
File
Home
Create
External Data
Database Tools
Fields
Table
View
Views
Text
Number
Currency
Add & Delete
Properties
Formatting
Field Validation
Formatting
Navigation Pane
ID
Click to Add
(New)
Record:
1 of 1
No Filter
Search
Datasheet View

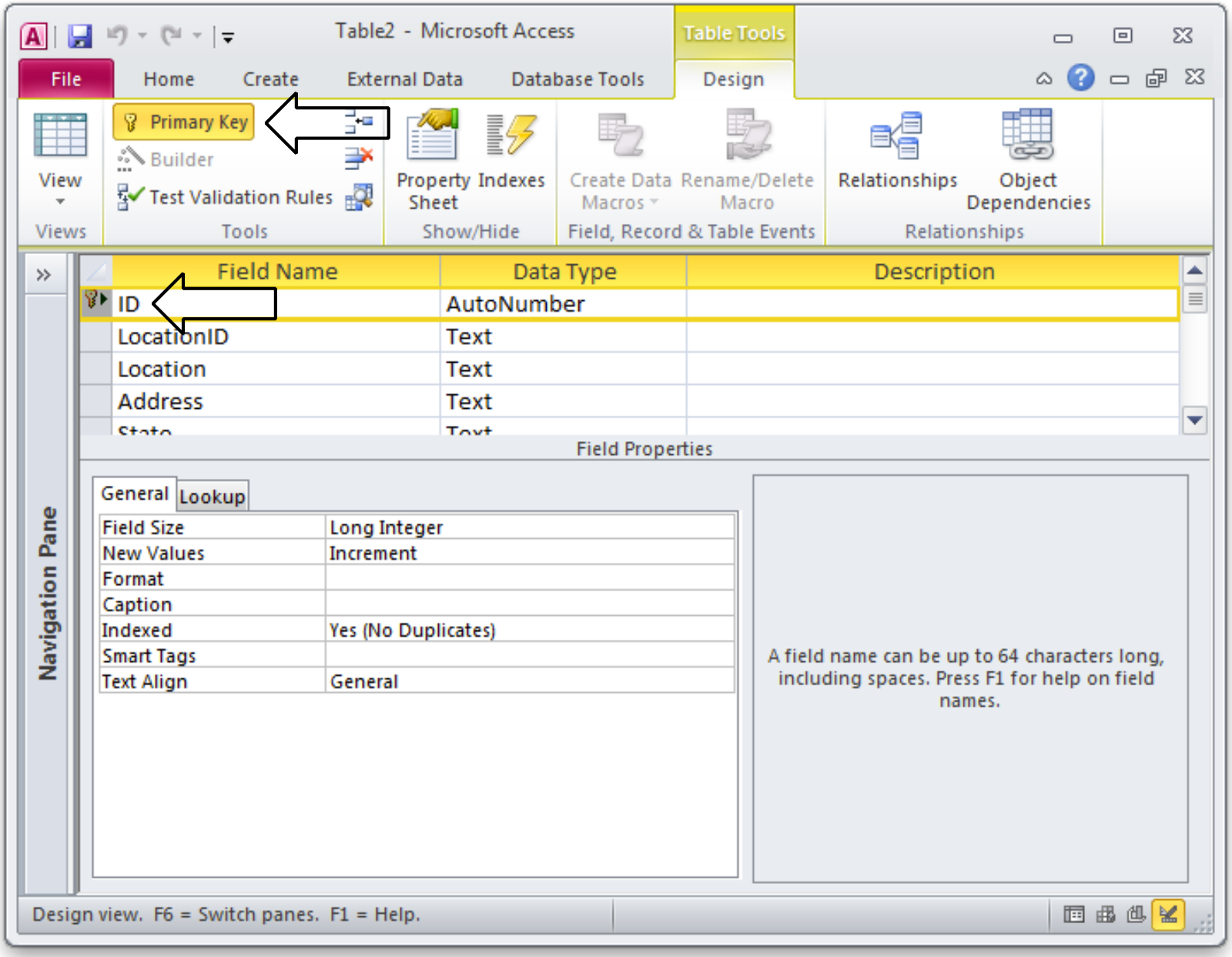
Switch Between Design and View



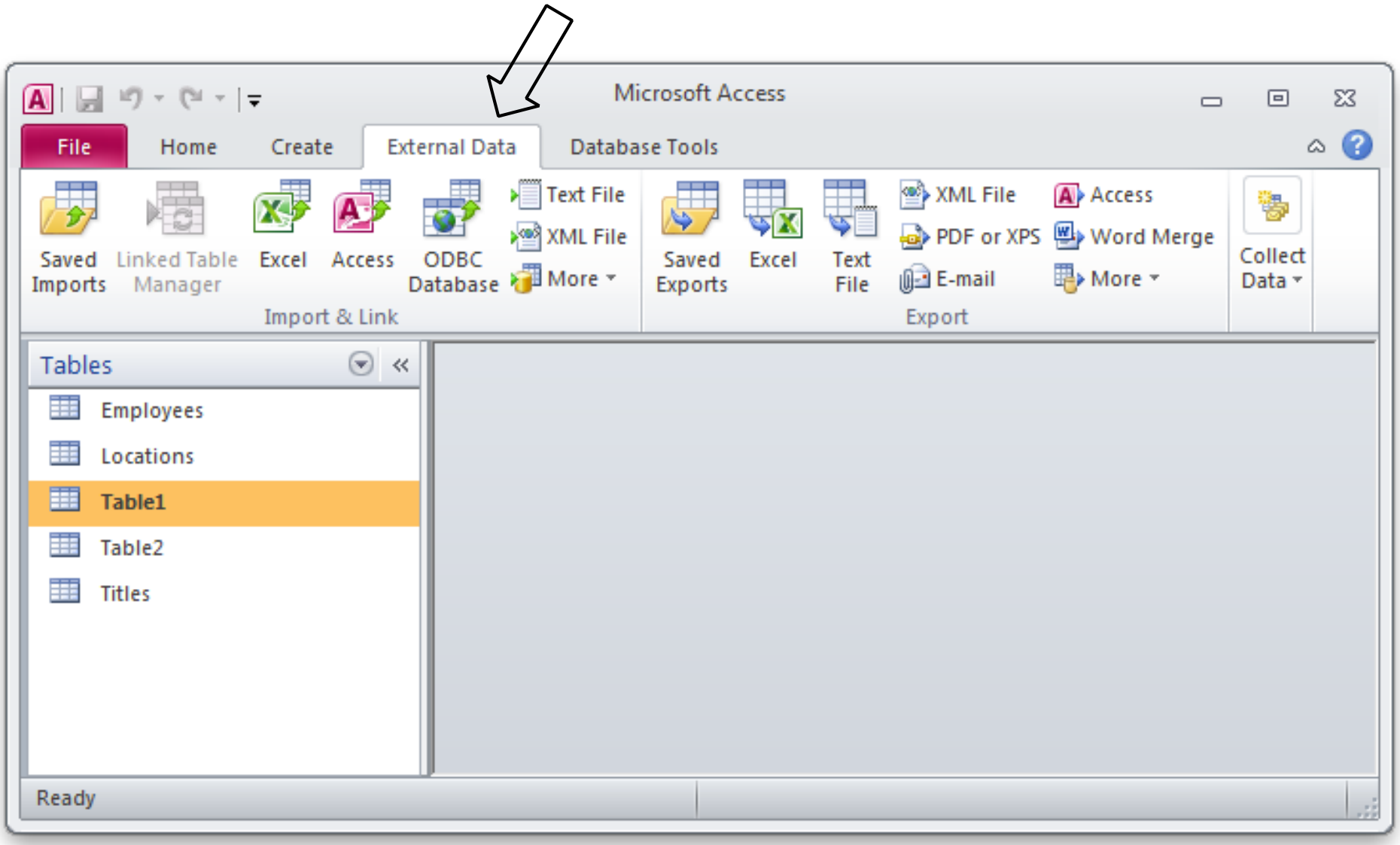
Primary Key

- Row must be unique!
- Database must be able to tell rows apart quickly to be fast
- Find fields (columns) that together will be unique and set them to be primary key.
- Can be set in Design mode

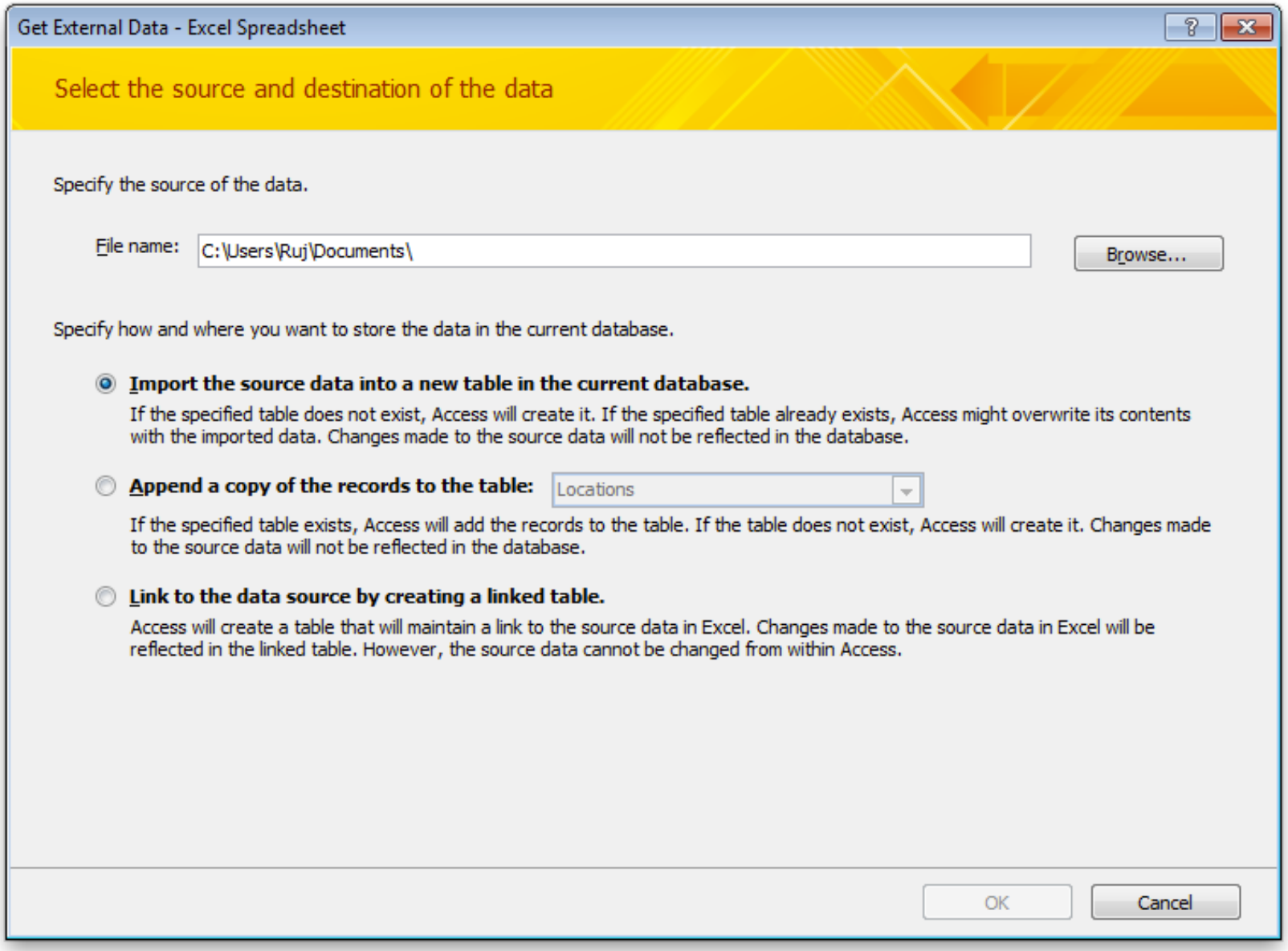
Set Primary Key



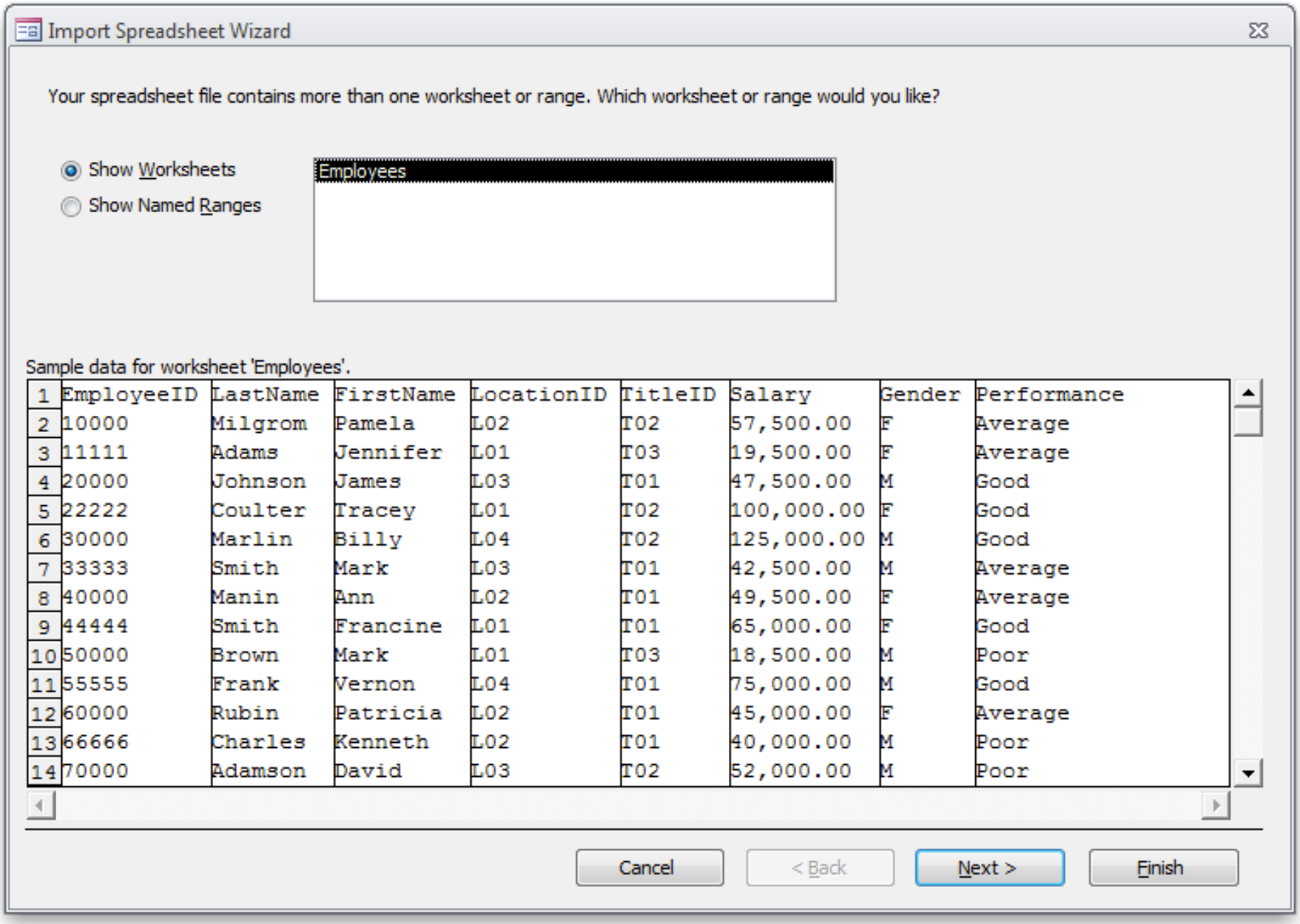
Import & Export Data (1)



Import & Export Data (2)

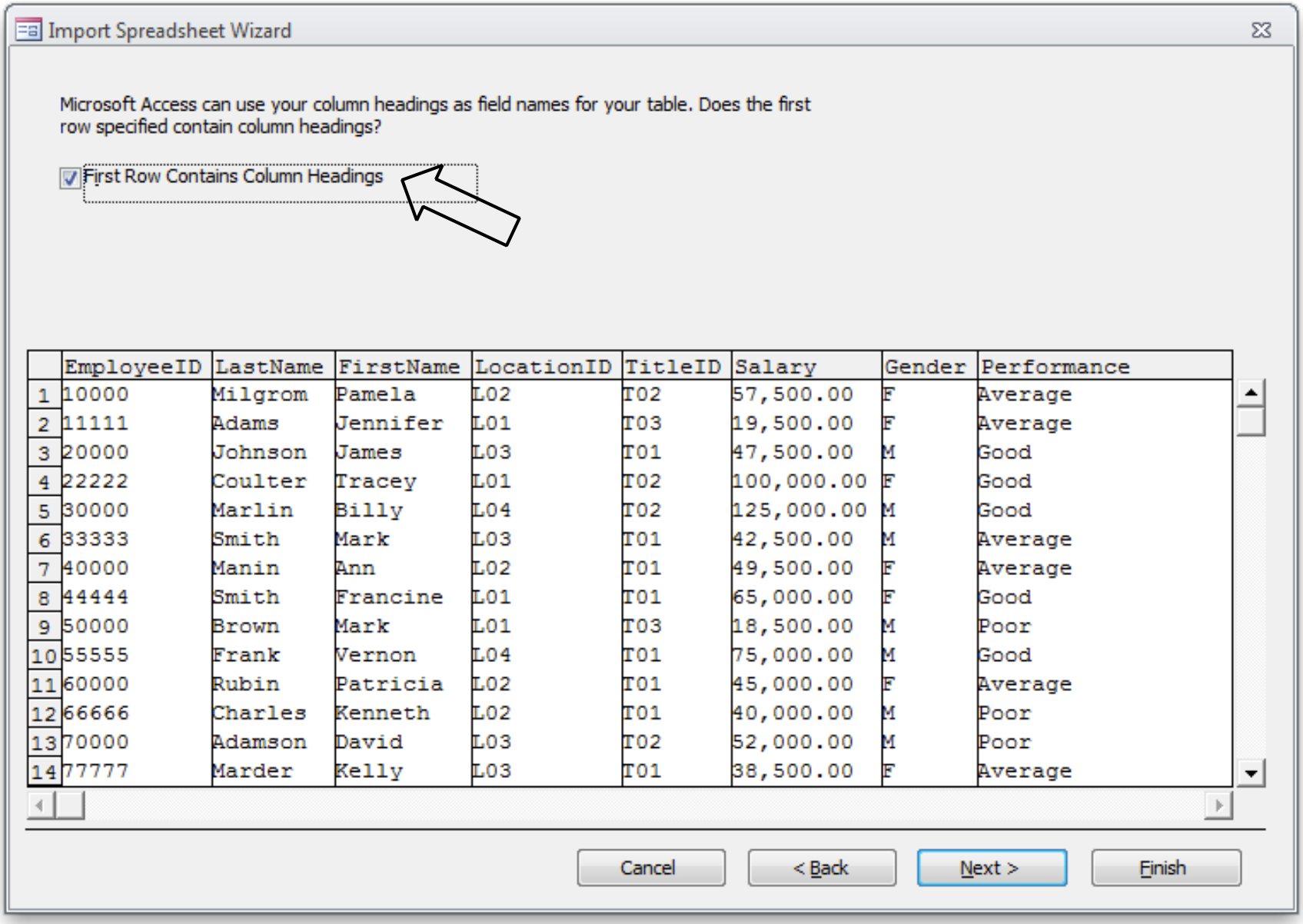


Import & Export Data (3)



1	EmployeeID	LastName	FirstName	LocationID	TitleID	Salary	Gender	Performance
2	10000	Milgrom	Pamela	L02	T02	57,500.00	F	Average
3	11111	Adams	Jennifer	L01	T03	19,500.00	F	Average
4	20000	Johnson	James	L03	T01	47,500.00	M	Good
5	22222	Coulter	Tracey	L01	T02	100,000.00	F	Good
6	30000	Marlin	Billy	L04	T02	125,000.00	M	Good
7	33333	Smith	Mark	L03	T01	42,500.00	M	Average
8	40000	Manin	Ann	L02	T01	49,500.00	F	Average
9	44444	Smith	Francine	L01	T01	65,000.00	F	Good
10	50000	Brown	Mark	L01	T03	18,500.00	M	Poor
11	55555	Frank	Vernon	L04	T01	75,000.00	M	Good
12	60000	Rubin	Patricia	L02	T01	45,000.00	F	Average
13	66666	Charles	Kenneth	L02	T01	40,000.00	M	Poor
14	70000	Adamson	David	L03	T02	52,000.00	M	Poor

Import & Export Data (4)



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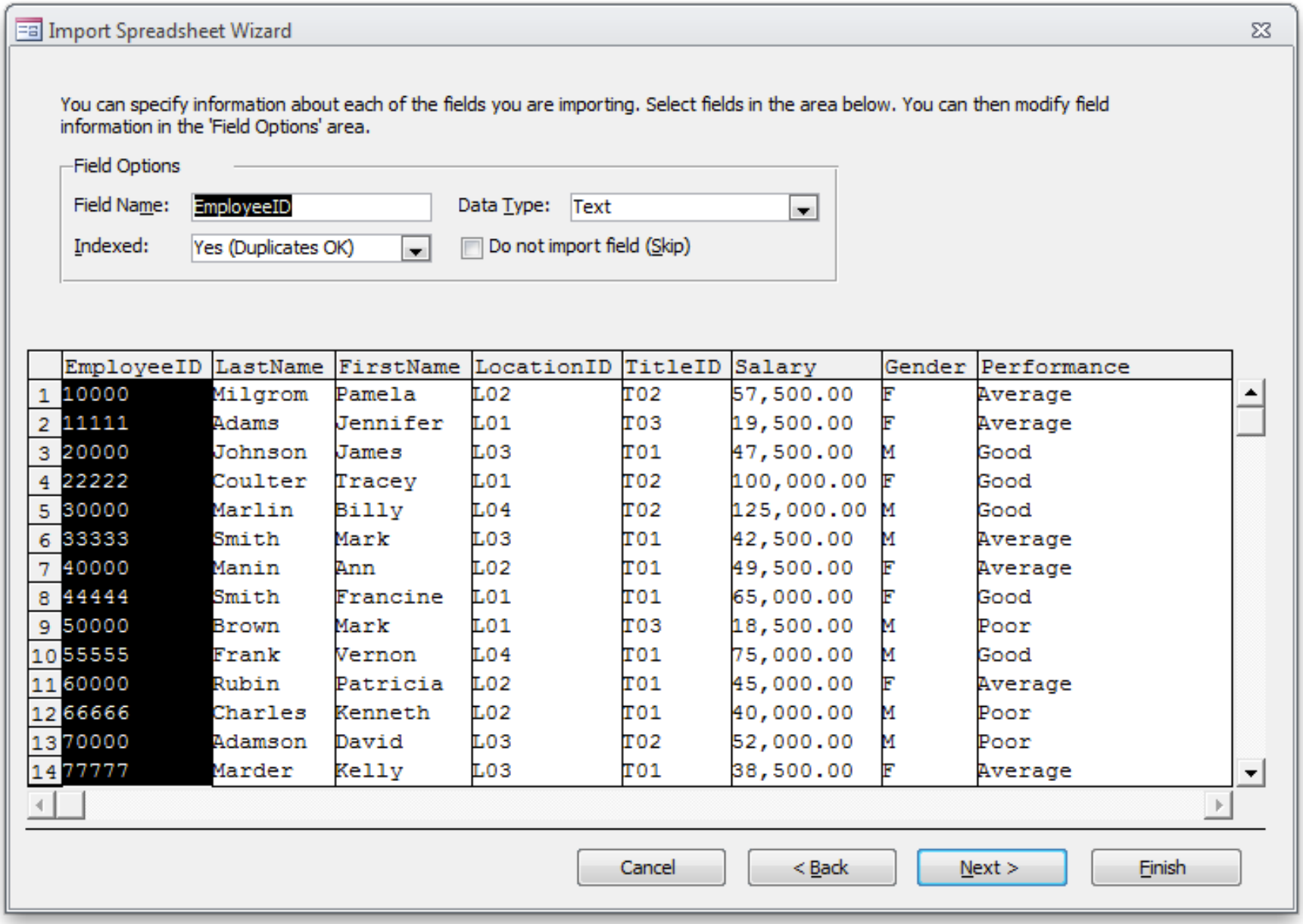
13	70000	Adamson	David	L03	T02	52,000.00	M	Poor
14	77777	Marder	Kelly	L03	T01	38,500.00	F	Average

Import & Export Data (5)



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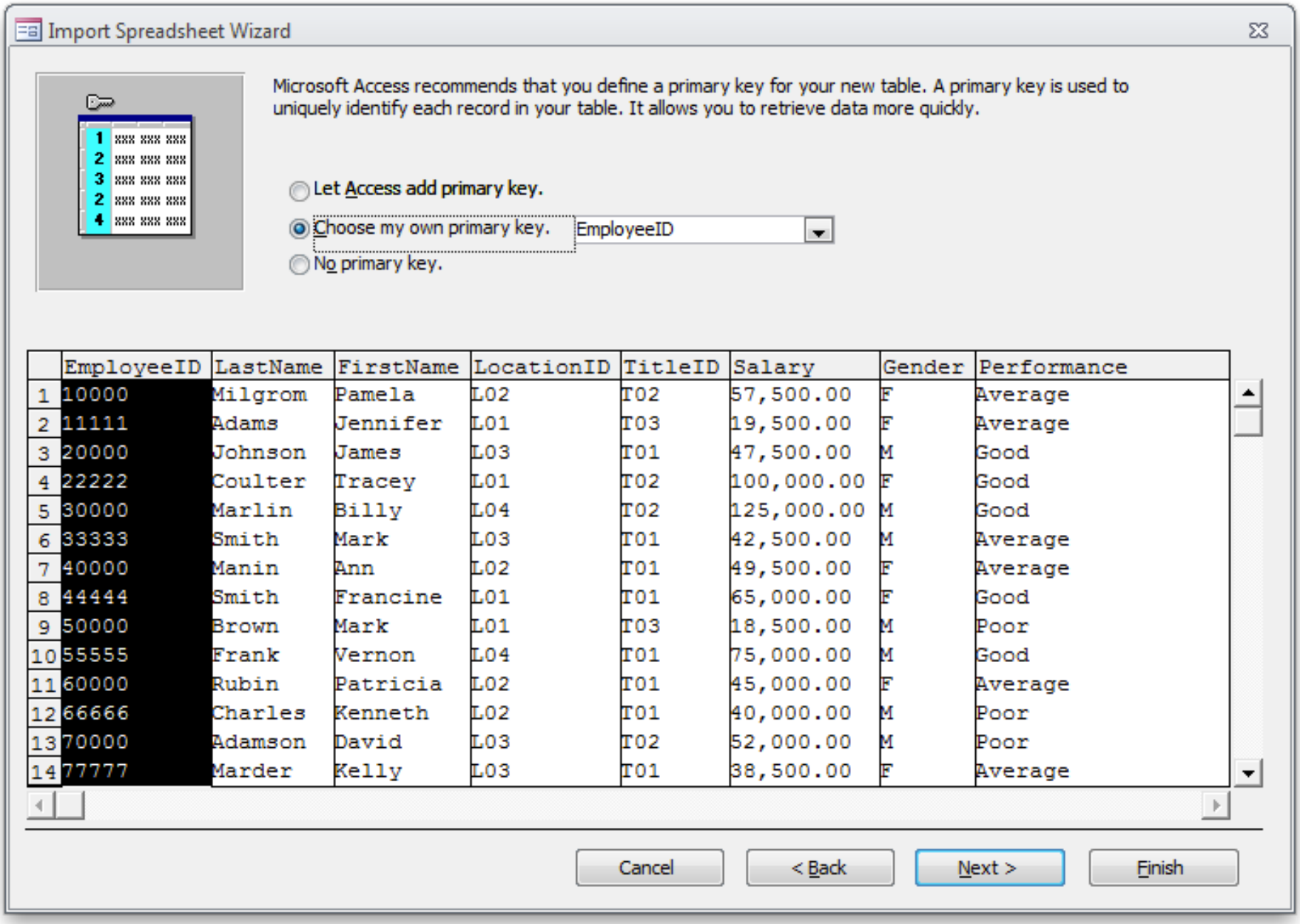
Import & Export Data (6)



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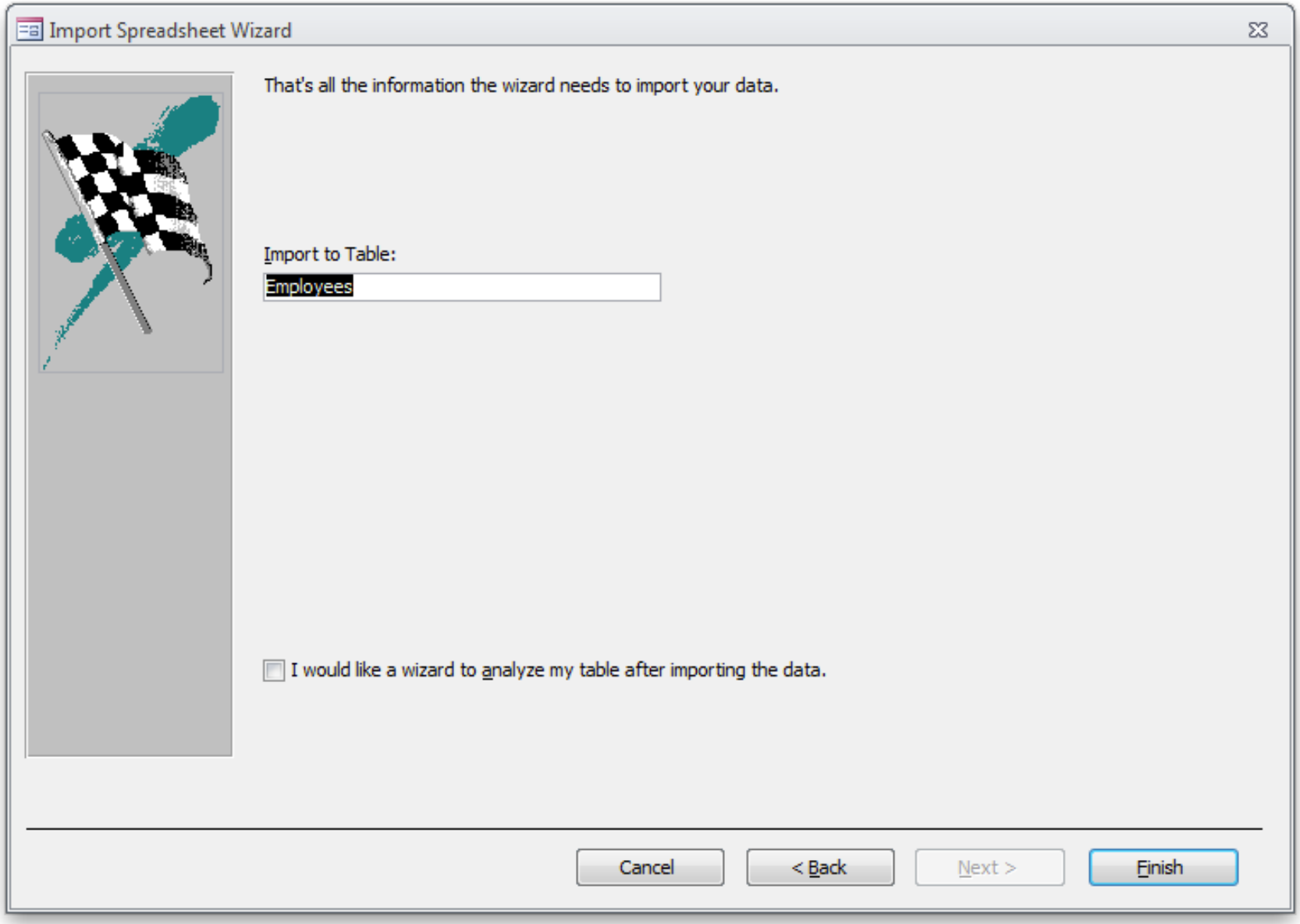
Import & Export Data (7)



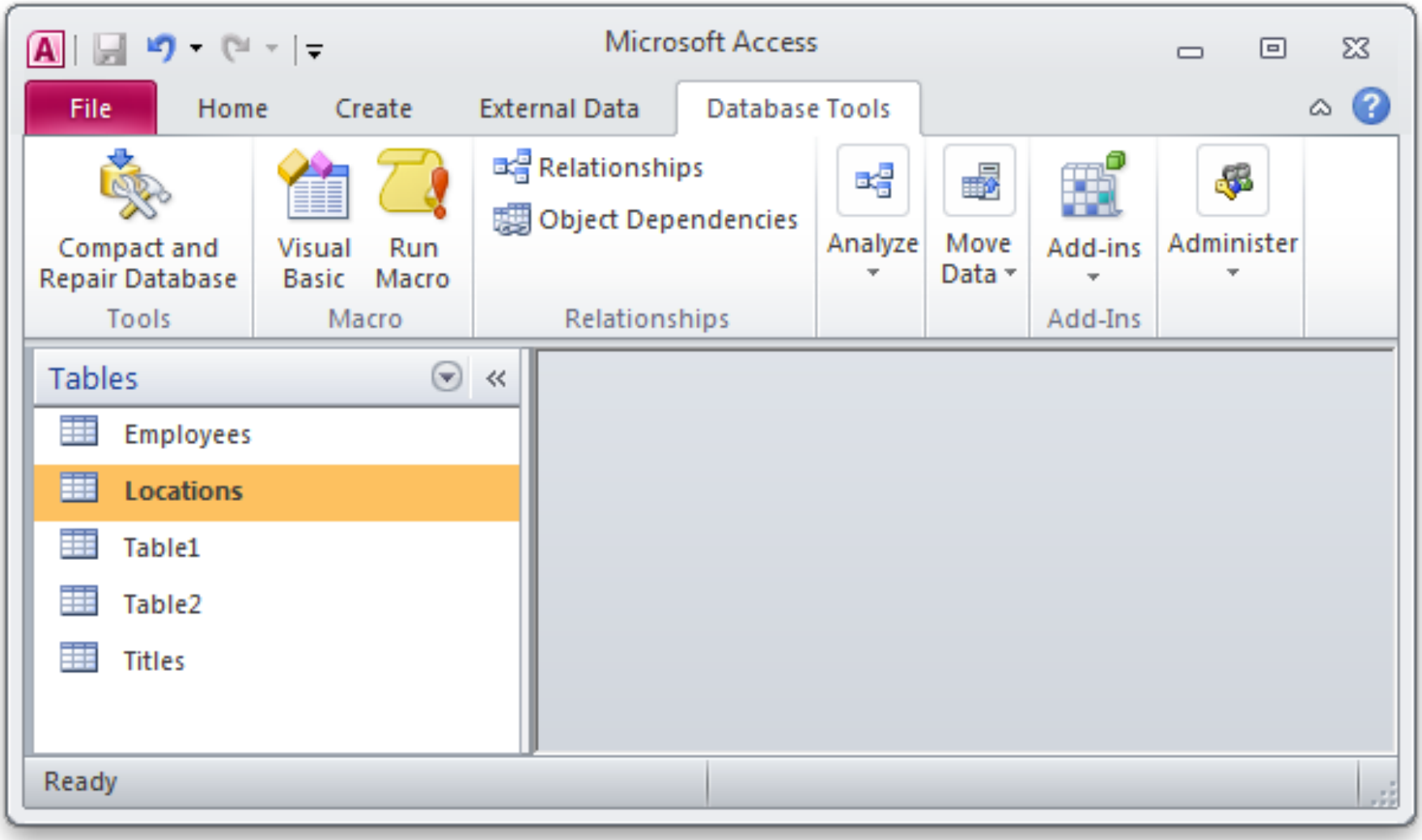
Relationship

- Define relationship to make querying easier
- Tell how database can look up more info from other tables

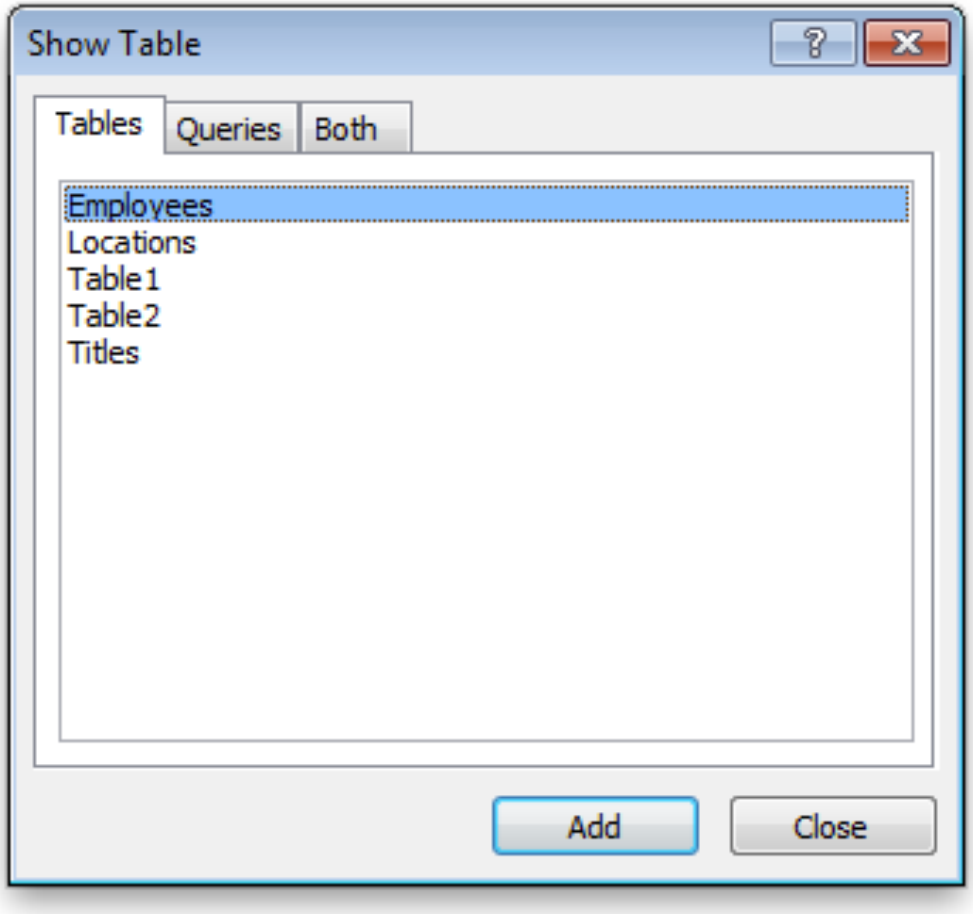
Types of Relationships

- One-to-one
  - For each record in a table, there is only one corresponding record in a related table
- One-to-many
  - Only one instance of a record in one table; many instances in a related table
- Many-to-many
  - Records in one table related to multiple records in another

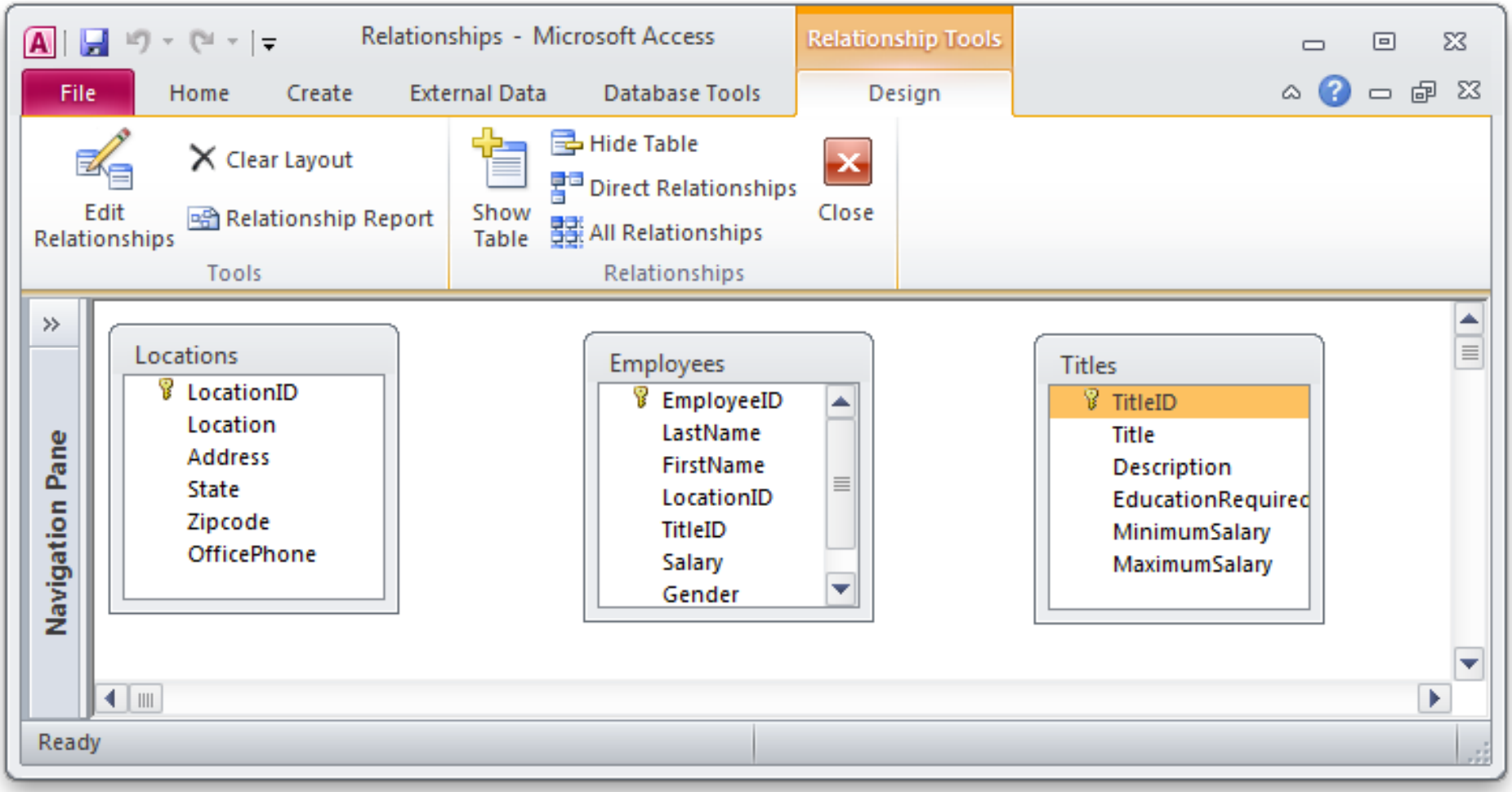
Define Relationship (1)



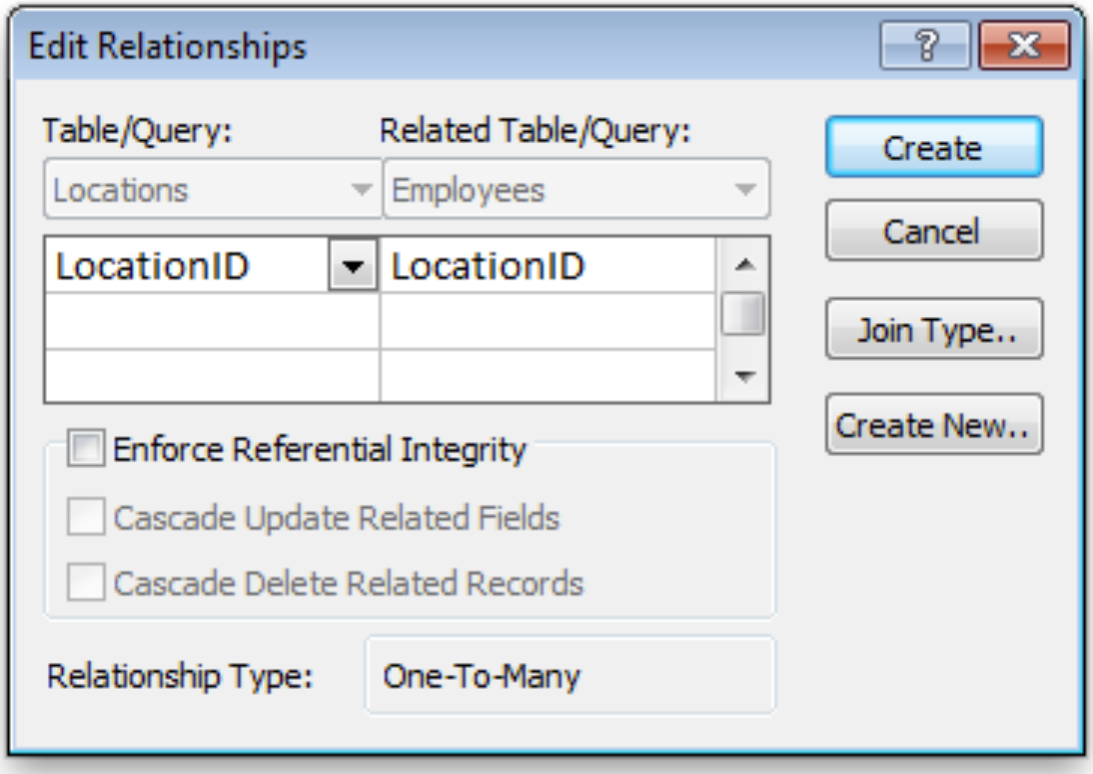
Define Relationship (2)



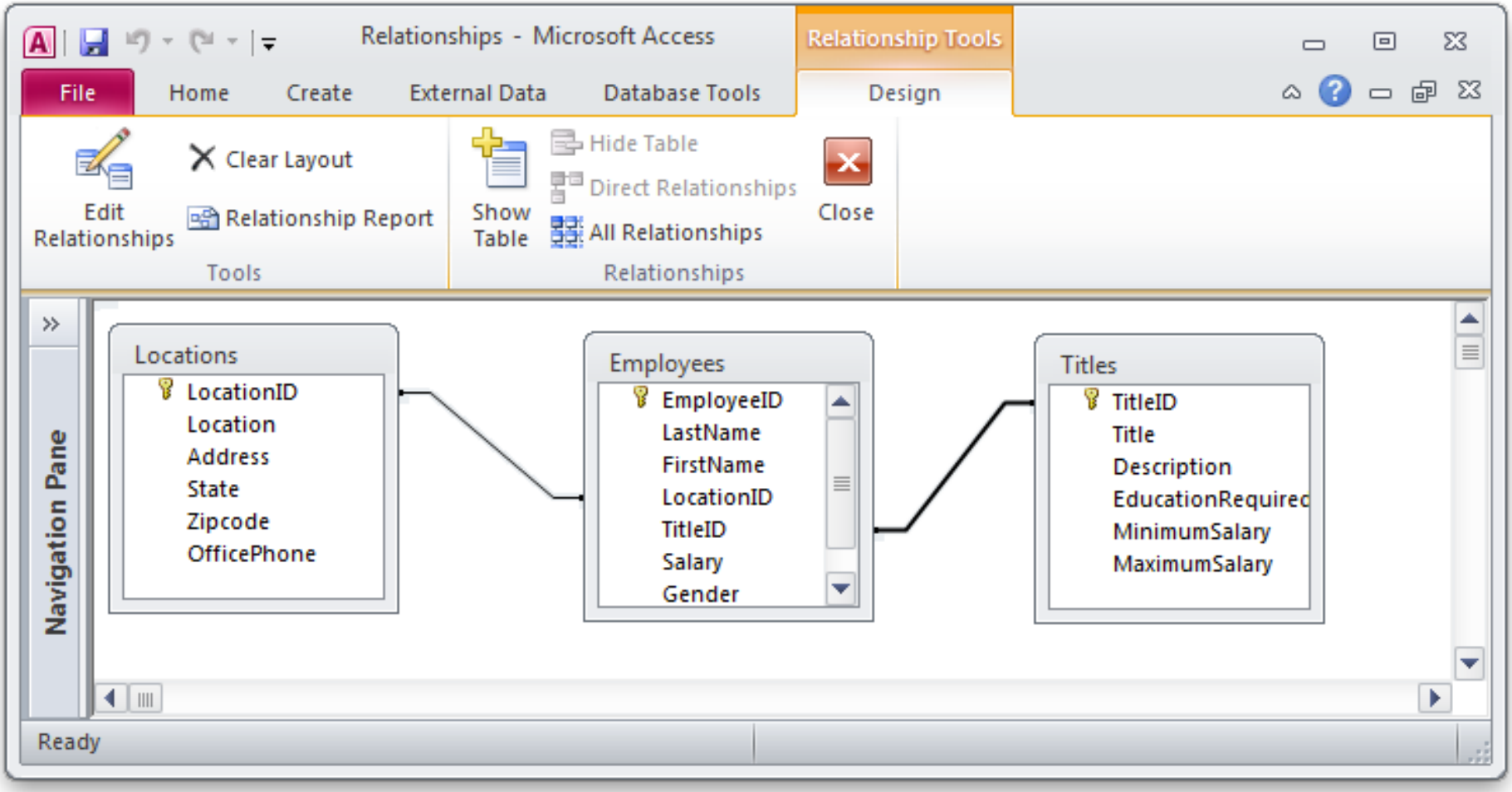
Define Relationship (3)



Define Relationship (4)



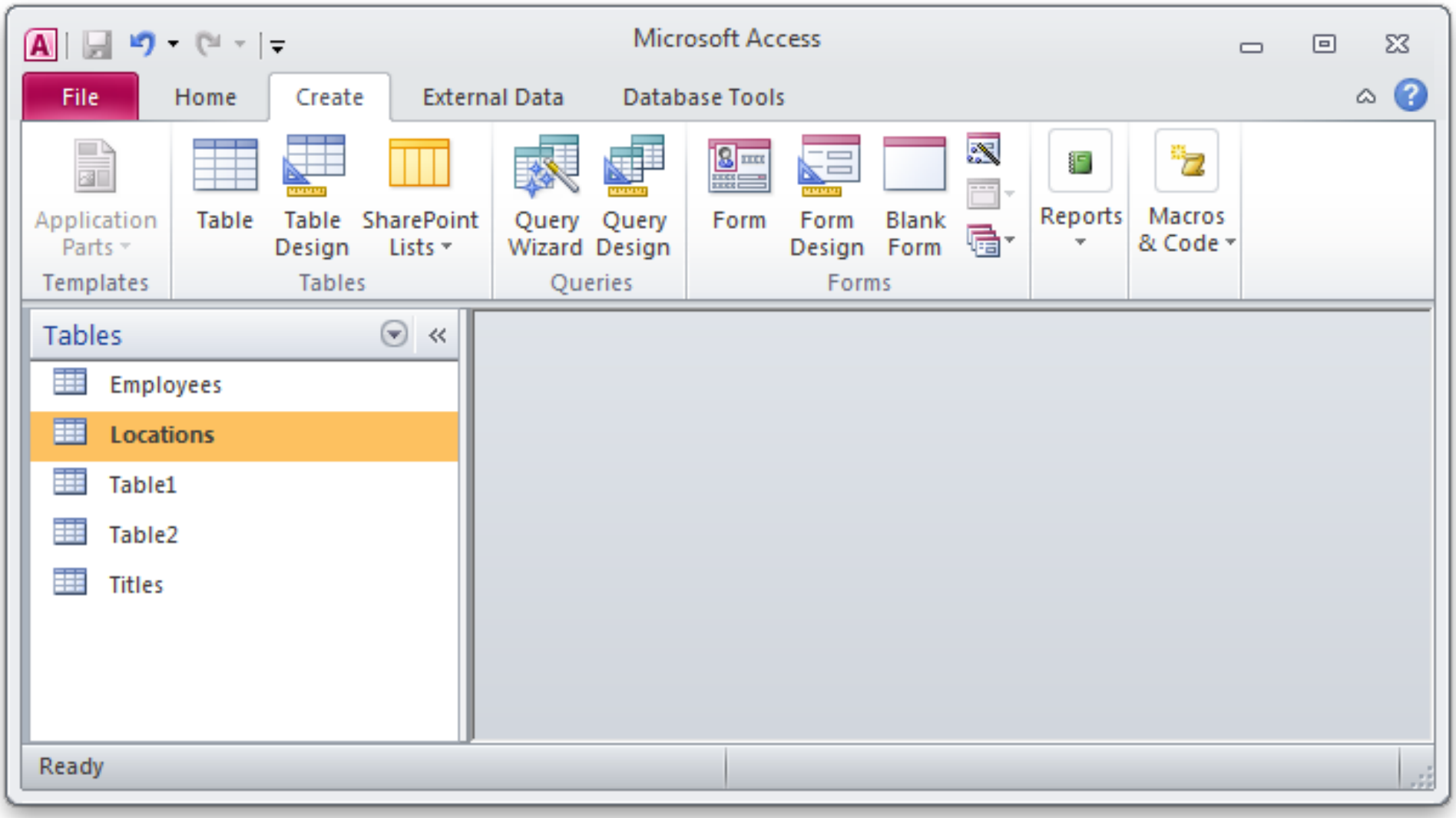
Define Relationship (5)



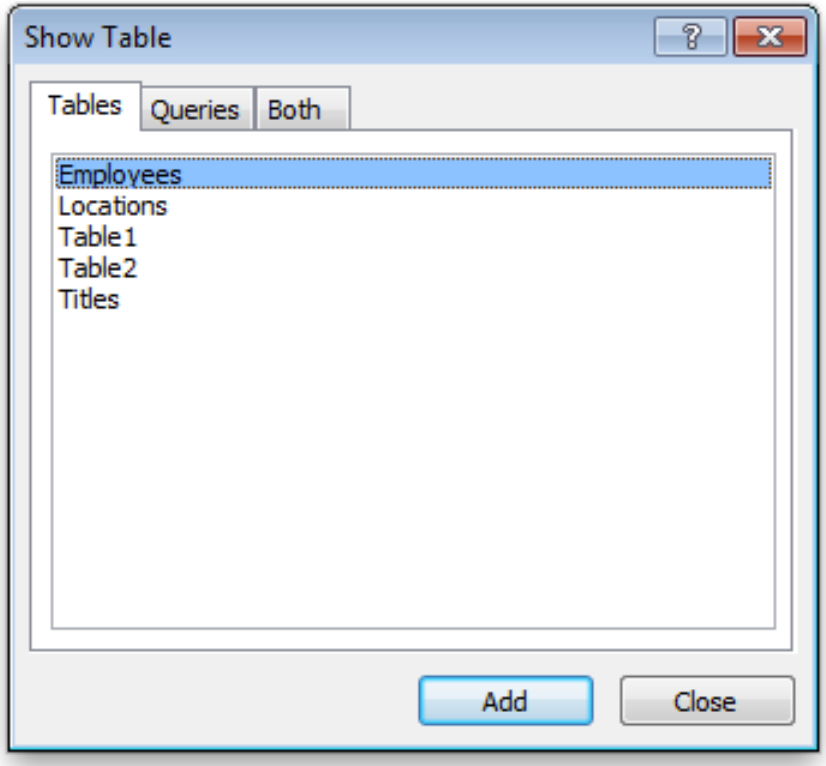
What Else

- Create Forms to enter data
- Create Reports to read data
- Ask questions
- Validate data

Querying (1)

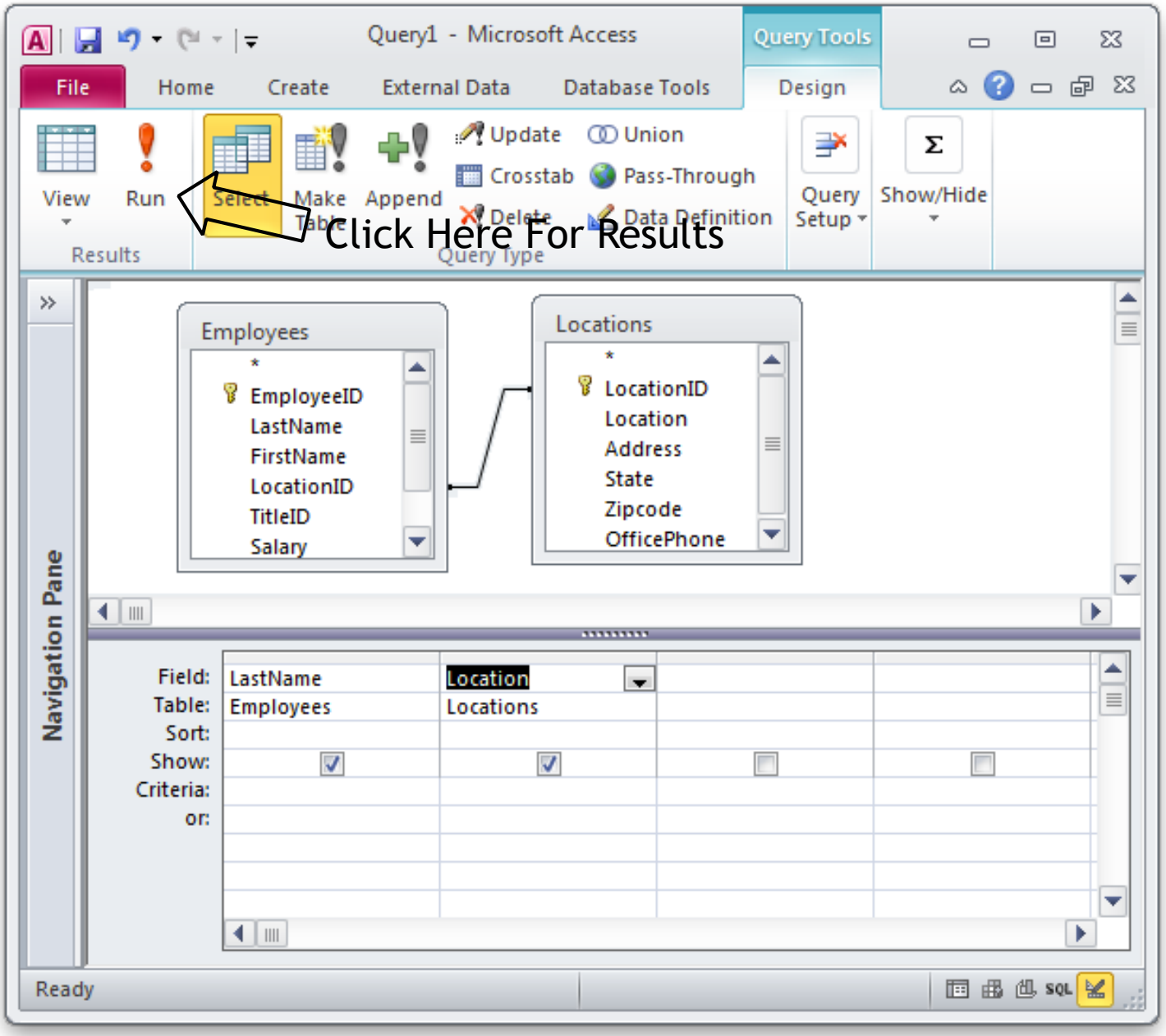

Microsoft Access
File
Home
Create
External Data
Database Tools
Application Parts
Templates
Table
Table Design
SharePoint Lists
Tables
Query Wizard
Query Design
Queries
Form
Form Design
Blank Form
Forms
Reports
Macros & Code
Tables
Employees
Locations
Table1
Table2
Titles
Ready

Querying (2)



- Drag what you want to know into table below
- Try Last Name and Location

Querying (3)


Query1 - Microsoft Access
Query Tools
File
Home
Create
External Data
Database Tools
Design
View
Run
Select
Make Table
Append
Update
Union
Crosstab
Pass-Through
Delete
Data Definition
Query Setup
Show/Hide
Results
Query Type
Click Here For Results
Navigation Pane
Employees
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EmployeeID
LastName
FirstName
LocationID
TitleID
Salary
Locations
*
LocationID
Location
Address
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Field:
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Show:
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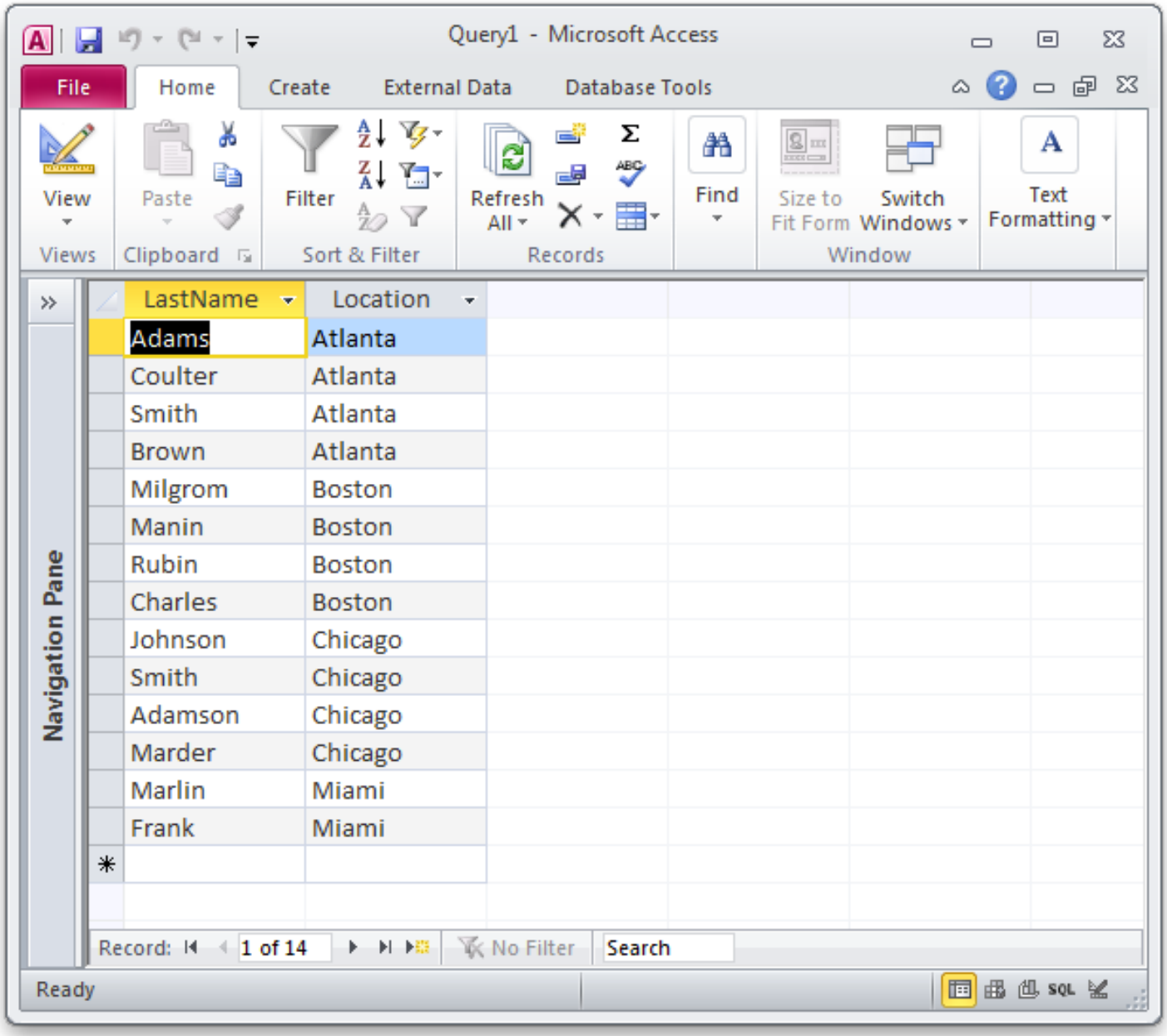
or:
LastName
Location
Employees
Locations
Ready
SQL

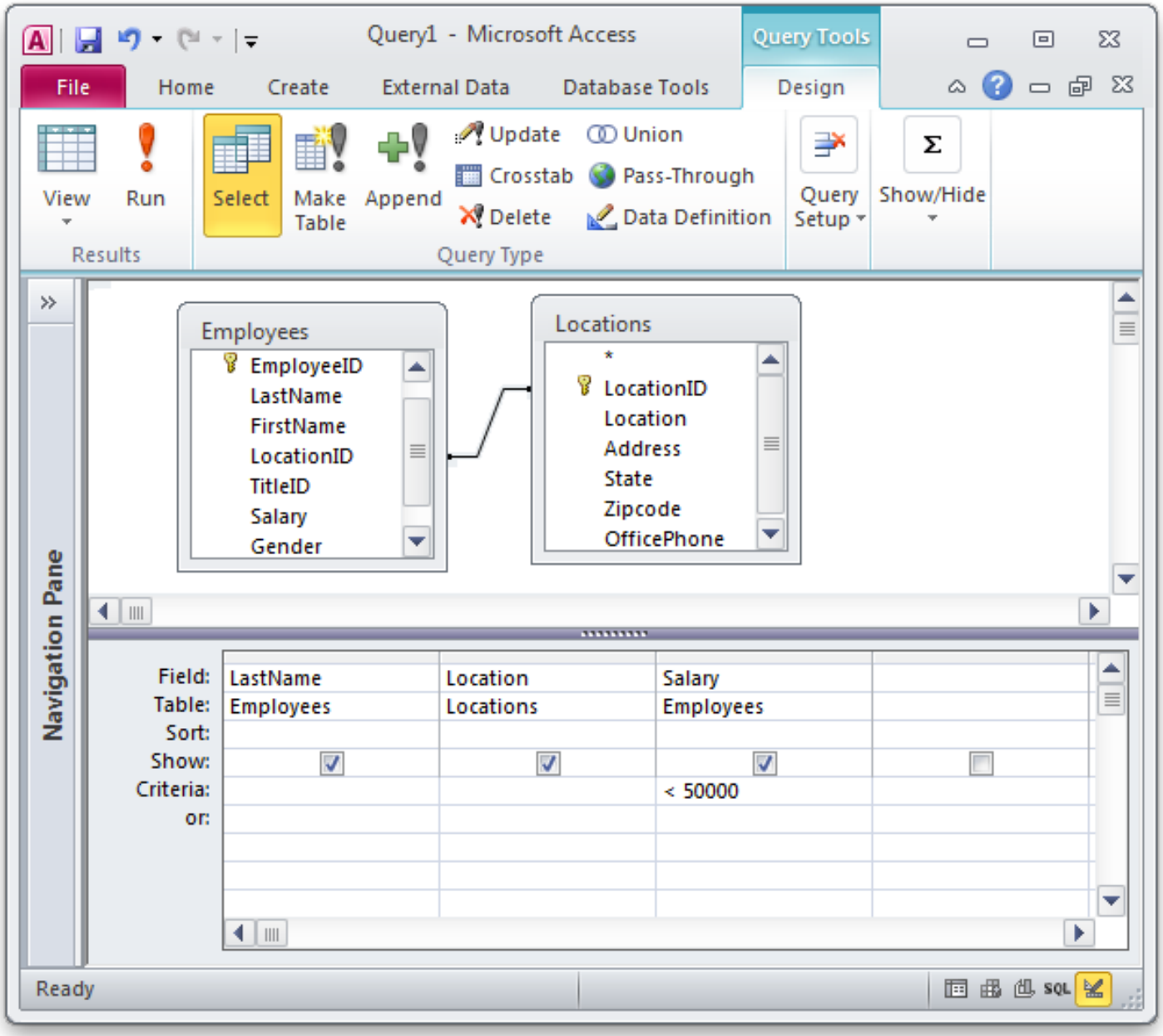
Querying (4)


Query1 - Microsoft Access
File
Home
Create
External Data
Database Tools
View
Views
Paste
Clipboard
Filter
Sort & Filter
Refresh All
Records
Find
Size to Fit Form
Switch Windows
Window
Text Formatting
Navigation Pane
LastName
Location
Adams Atlanta
Coulter Atlanta
Smith Atlanta
Brown Atlanta
Milgrom Boston
Manin Boston
Rubin Boston
Charles Boston
Johnson Chicago
Smith Chicago
Adamson Chicago
Marder Chicago
Marlin Miami
Frank Miami
Record: 1 of 14
No Filter
Search
Ready
SQL

Querying (5)

- You can set condition
  - Salary < 50,000
- Same row means “and”
- Different row means “or”
- Try putting “Boston” into different rows

Querying (6)


Query1 - Microsoft Access
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Pass-Through
Delete
Data Definition
Query Setup
Show/Hide
Results
Query Type
Navigation Pane
Employees
EmployeeID
LastName
FirstName
LocationID
TitleID
Salary
Gender
Locations
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LocationID
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Address
State
Zipcode
OfficePhone
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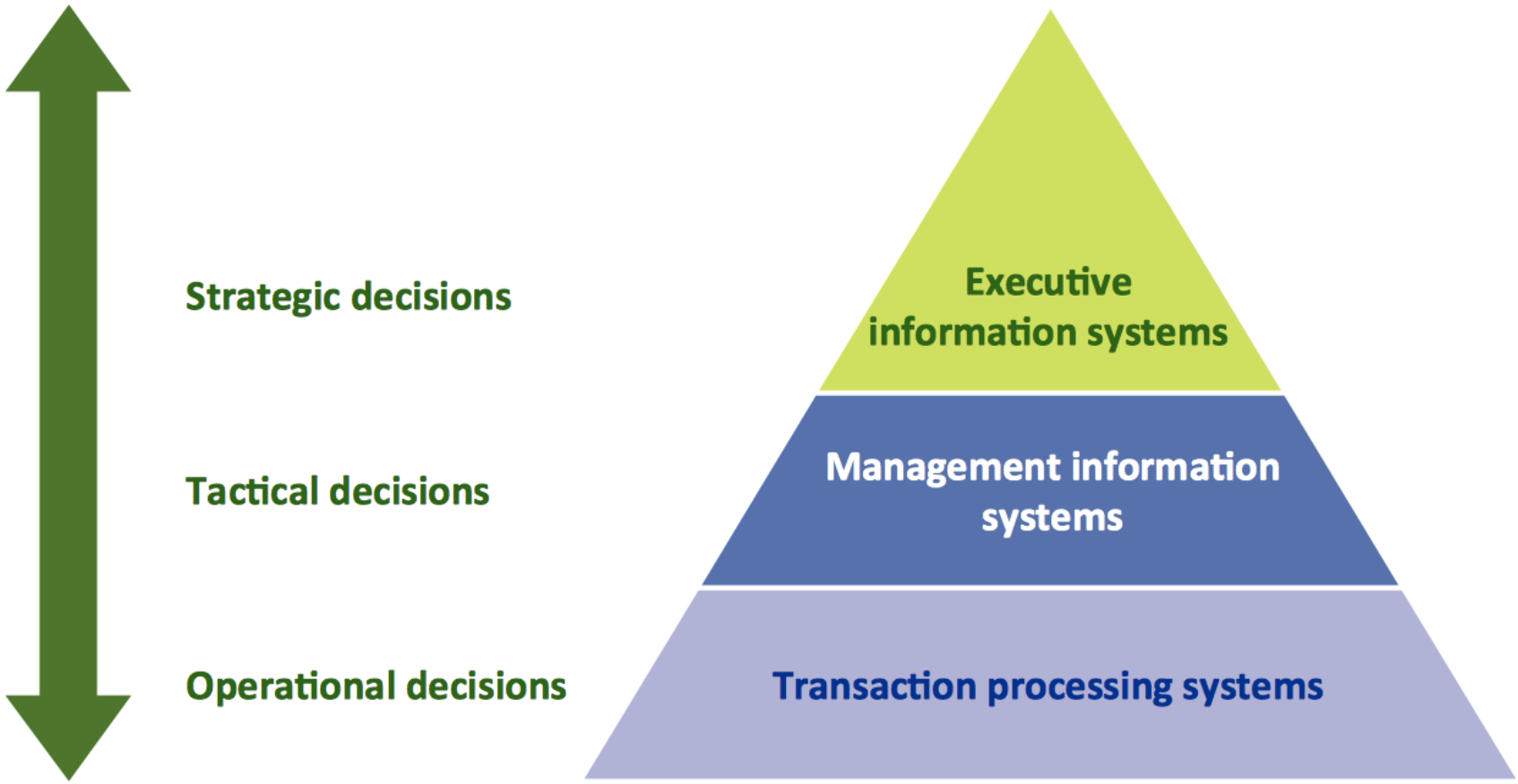
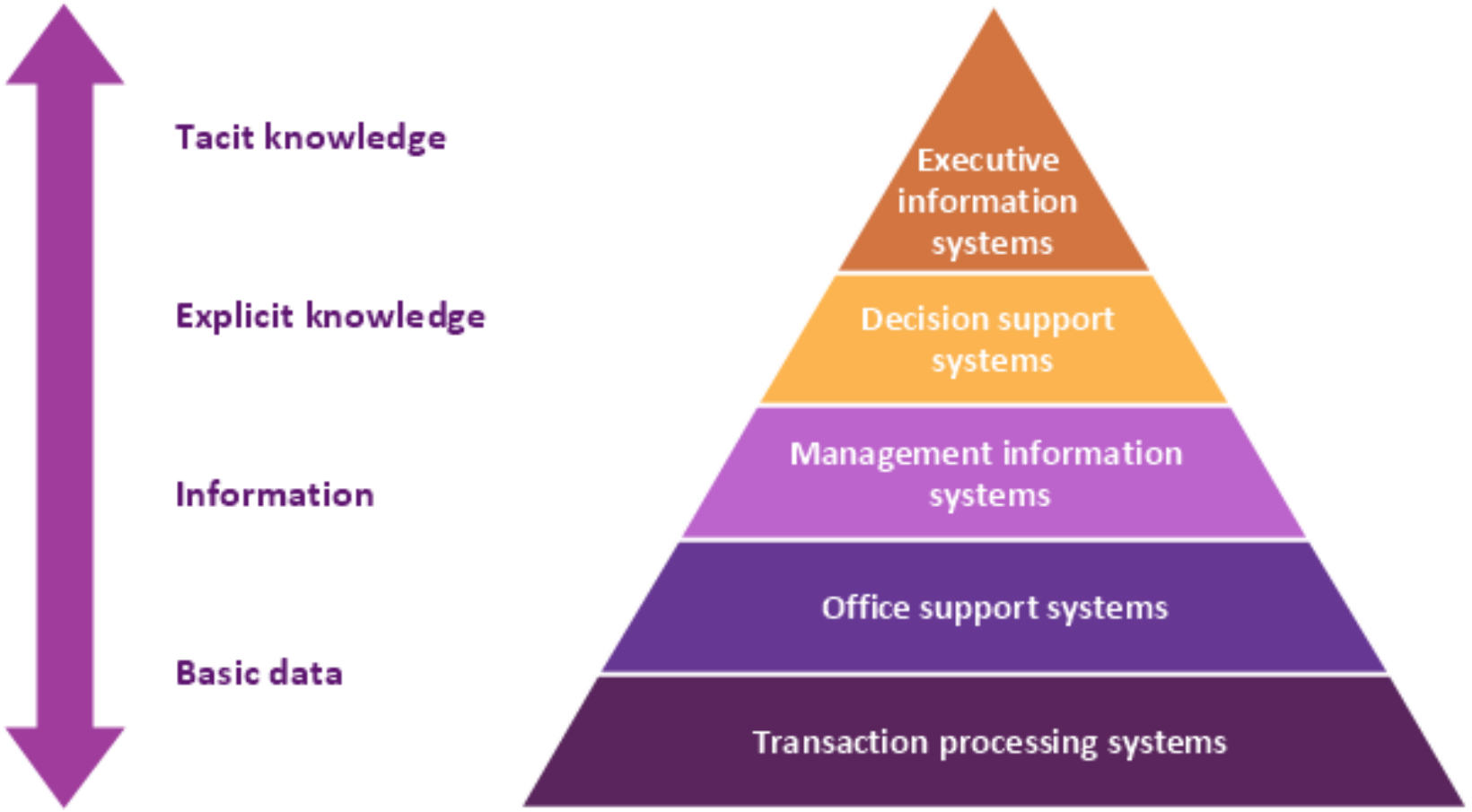
Table:
Sort:
Show:
Criteria:
or:
LastName
Location
Salary
Employees
Locations
Employees
< 50000
Ready
SQL

Information Systems Types (1)



Information Systems Types (2)



Assignment 6 (1)

- Create a table named “**Locations**”
- Be in Design mode
- Open Locations.xlsx using Excel
- Look at column names in Excel and enter them as fields in Access
- Choose appropriate data type.
- Save

Assignment 6 (2)

- Create a table named “Titles”
- Be in View mode
- Open Titles.xlsx using Excel.
- Copy and paste everything into table.
- Save

Assignment 6 (3)

- Import From Employees.xlsx (Excel File) to a new table named Employee

Assignment 6 (4)

- Define relationships of all tables.

Assignment 6 (5)

- Find who live in Boston with less than 50000 salary
- Find titles of those who live in Boston with less than 50000 salary