Microsoft Access 2007 – Relationship

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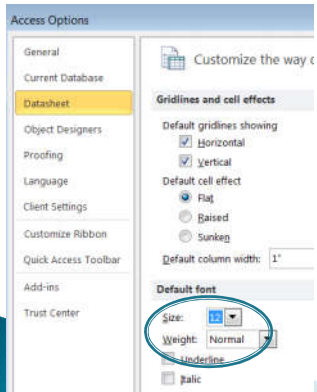## Data for This Lab

‣ https://goo.gl/XYTc5p
‣ https://goo.gl/ShNjmJ

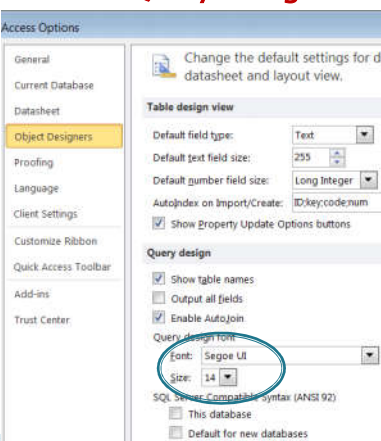‣ Save the file *13_student_class.accdb* and *13_student_class_rel.accdb* on your computer.

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Changing Font Size → Access Options

Query Design

Datasheet

Review: Relationship

‣ Relationship tells you how records in one table related to record in another table.
  ◦ How different data relate.
‣ Type of Relationship:
  ◦ One to one (1:1)
  ◦ One to many (1:N)
  ◦ Many to many (M:N)

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One-to-One (1:1)

▸ Store – Manager
  ◦ Each store is managed by a store manager
  ◦ Each store manager manages only one store

| Manager | 1 — manages — 1 | Store |

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One-to-Many (1:N)

▸ Painter – Painting
  ◦ A painter creates many paintings
  ◦ Each painting is painted only by one painter

| Painter | 1 — paints — N | Painting |
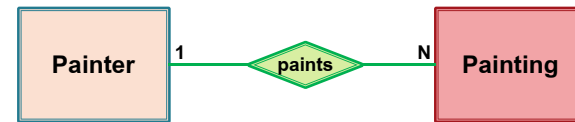
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Many-to-Many (M:N)

▸ Employee – Job Skill
  ◦ An employee may learn many job skills
  ◦ Each job skill may be learned by many employees

| Employee | M — learns — N | Skill |
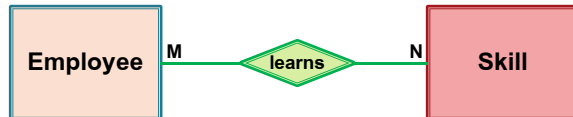
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Getting Start

Now, we will start
with *13_student_class.accdb*

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Student Table Revisited

Field Name	Data Type	Field Size
Student ID	Text	9
Title	Text	10
First Name	Text	20
Last Name	Text	20
Birth Date	Date/Time	
GPA	Number	Single
Blood Type	Text	5
Pet	Text	20
Allowance	Currency	
E-mail Address	Text	50

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Student – Advisor

- A Student has only one advisor
- A lecturer can advise many students
- 1:N or N:1?

LECTURER — 1 — advises — N — STUDENT
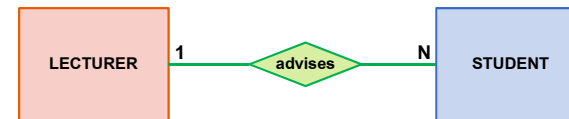
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Relationship with Foreign Key
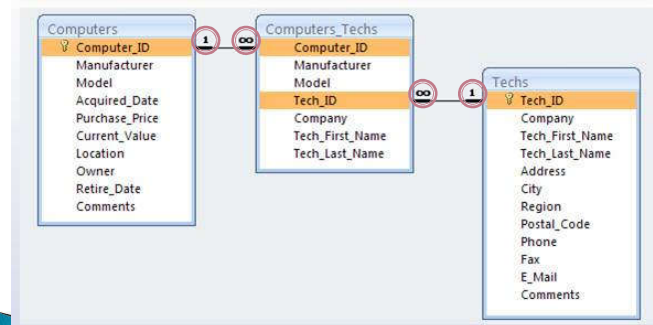
- One-to-Many Relationship type.
  - Relationship can be created by including a field from the LECTURER table as a new field in STUDENT table. The new field is call a foreign key
- If the relationship is 1:N, the foreign key will always be on the many side.

PK(Table 1) → FK(Table N)

LECTURER
Lecturer ID
....
etc.

1 — ∞

STUDENT
Student ID
....
Advisor ID (FK)
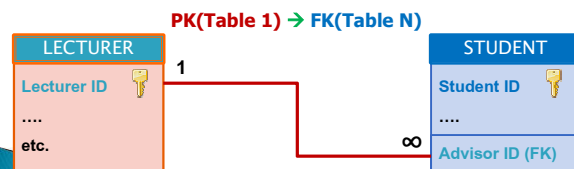
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Relationship in MS Access

- Between 2 tables, MS Access can only do 1:1 and 1:N (Not N:M).

Computers
Computer_ID
Manufacturer
Model
Acquired_Date
Purchase_Price
Current_Value
Location
Owner
Retire_Date
Comments

1 — ∞

Computers_Techs
Computer_ID
Manufacturer
Model
Tech_ID
Company
Tech_First_Name
Tech_Last_Name

∞ — 1

Techs
Tech_ID
Company
Tech_First_Name
Tech_Last_Name
Address
City
Region
Postal_Code
Phone
Fax
E_Mail
Comments

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Restriction

- In a database, all table names must be unique
  - Can't have two tables with the same name
- In a table, all field names must be unique
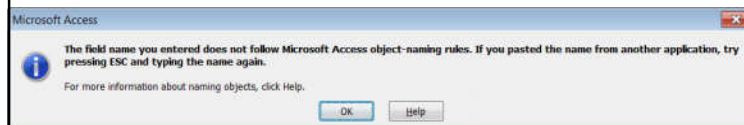 - Can't have two columns with the same name.

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Lecturer Table

Field Name	Data Type
🔑 Lecturer ID	Text
Title	Text
First Name	Text
Last Name	Text
Office	Text
Phone Number	Text
E-mail Address	Text

- Right Click -> Design View
  - Which field is the Primary key?
  - What is the Data Type?
  - How do you find the Field Size?

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Creating a Foreign Key (FK)

- Student Table -> Design View

- Create a new Field called "Advisor.ID"
  - Enter

Microsoft Access

ⓘ The field name you entered does not follow Microsoft Access object-naming rules. If you pasted the name from another application, try pressing ESC and typing the name again.

For more information about naming objects, click Help.

OK   Help

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Field Name

- Can be up to 64 characters long
- Cannot include
  - ! (an exclamation point)
  - [ ] (brackets)
  - ` (a grave accent)
  - . (a period)
- Cannot begin with leading spaces

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Creating a Foreign Key (FK)

▸ Create a new Field
◦ Called "Advisor ID"
◦ Data Type: "Text"
◦ Field Size: 8
◦ Data Type and Size has to be the same as the PK of the related table.
◦ The field name can be different.

Field Name	Data Type
Student ID	Text
Title	Text
First Name	Text
Last Name	Text
Birth Date	Date/Time
GPA	Number
Blood Type	Text
Pet	Text
Allowance	Currency
E-mail Address	Text
Advisor ID	Text

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The "Indexed" Option

General | Lookup

Field Size	8
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Allow Zero Length	Yes
Indexed	Yes (Duplicates OK)
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Smart Tags	

Yes (No Duplicates)
No
Yes (Duplicates OK)
Yes (No Duplicates)

▸ Duplicates (OK)
◦ One-to-Many (1:N) ✔
▸ No Duplicate
◦ One-to-One (1:1)

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Creating a Relationship [1.1]
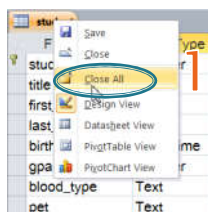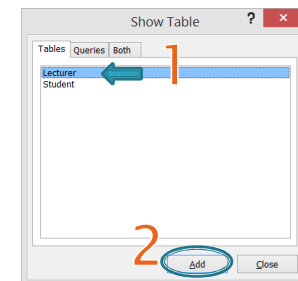
▸ Right Click -> Close All
▸ Database Tools
◦ Relationships
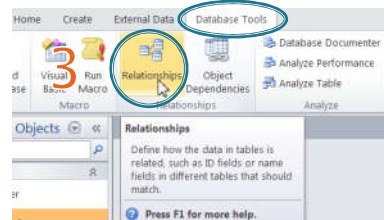
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Creating a Relationship [1.2]

▸ Adding the tables
◦ Click on "Lecturer"
  • Add
◦ Click on "Student"
  • Add
◦ Close

Show Table

Tables | Queries | Both

Lecturer
Student

Add   Close

Lecturer
♀ Lecturer ID
Title
First Name
Last Name
Office
Phone Number
E-mail Address

Student
♀ Student ID
Title
First Name
Last Name
Birth Date
GPA
Blood Type
Pet
Allowance
E-mail Address
Advisor ID

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Creating a Relationship [1.3]

▸ Click on "Advisor ID" [Student]
  ◦ Drag and drop on "Lecturer ID" Lecturer]
▸ A Dialog Box "Edit Relationship" will show up
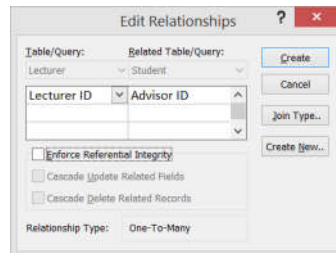
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Creating a Relationship [1.4]

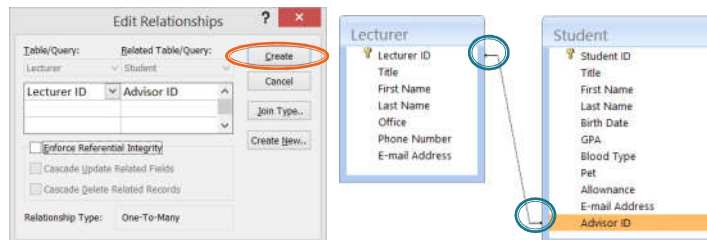▸ Notice the "One-To-Many" label
  ◦ Which table is on which side?
  ◦ What if we reverse the dragging direction? (lecturer_id -> advisor_id)
▸ The table on the "One" label of the relationship is always on the left (with the PK)
▸ The table on the "Many" label is always on the right (with the FK)
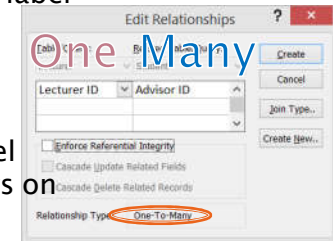
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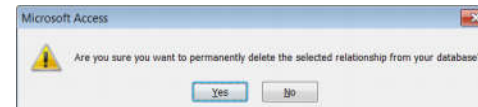## Creating a Relationship [1.5]

▸ Click "Create"

▸ Now we have a relationship
  ◦ Notice that the 1:N (or 1:∞) is missing

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Removing a Relationship
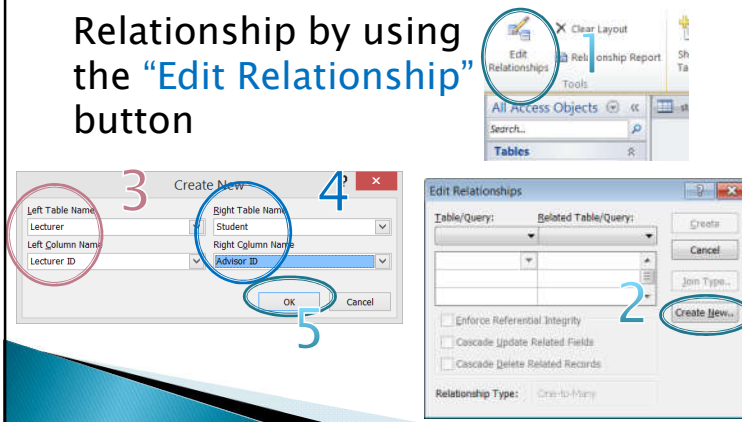
▸ Click on the line and then "Delete"

  ◦ Click "Yes"

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Creating a Relationship [2.1]

▸ We can also create a Relationship by using the "Edit Relationship" button

Creating a Relationship [2.2]

▸ Enforce Referential Integrity
  ◦ The value in FK field has to map to a valid PK in another table
▸ Cascade Update Related Field
  ◦ If Lecturer ID is changed all related records in the Student table will get updated.
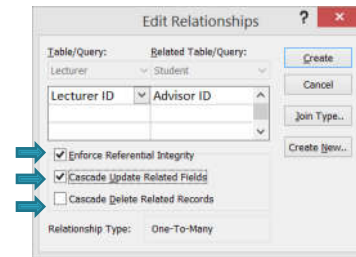
• **Cascade Delete Related Field**
  • **If any record in the Lecturer table is deleted the related records in the Student table will also be deleted**

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Creating a Relationship [2.3]

▸ **In this lab we check all 3 options**

• **Save and Close**

▸ **Now we have Relationship 1:N (1:∞)**
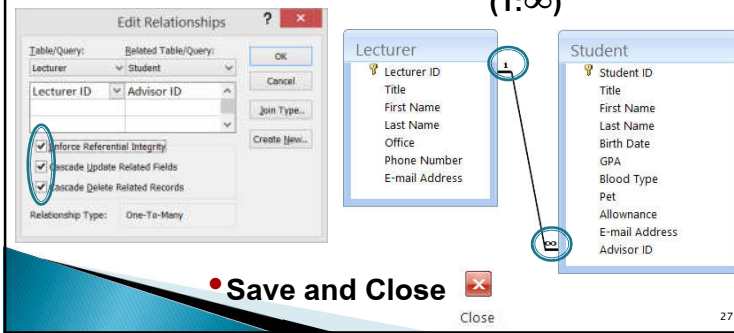
Close

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Assigning Relationship [1]

▸ Open the student table
  ◦ Right Click on First Name
    · Freeze Columns
  ◦ Then we move to Advisor ID

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Assigning Relationship [2]
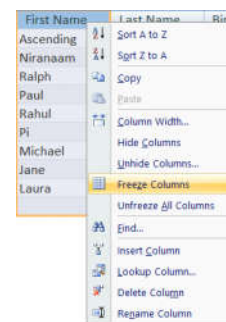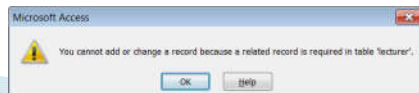
- ▸ Fill in the following data
- ▸ a dialog box saying "a related record is required" will show if entering wrong data
  - ◦ Save & Close

First Name	Advisor ID
Ascending	LEC23720
Niranaam	LEC23720
Ralph	LEC11348
Paul	LEC36231
Rahul	LEC66451
Pi	LEC11348
Michael	LEC11348
Jane	LEC36231
Laura	LEC36231

Microsoft Access

⚠ You cannot add or change a record because a related record is required in table 'lecturer'.

OK   Help

Assigning Relationship [3]

- ▸ In the lecturer table
  - ◦ By clicking on the plus sign (+) at the front of each record, the related records from the student table will unfold.

Student | Lecturer

Lecturer ID	Title	First Name	Last Na
⊞ LEC11348	Associate Professor	Brandon	Fowler
⊟ LEC23720	Professor	Noah	Howard

First Name	Student ID	Title	Last Name
Niranaam	555555555	Mr.	Raisakul
Ascending	500123456	Mr.	Order
*			

⊞ LEC36231	Lecturer	Florence	Allison
⊞ LEC66451	Assistant Professor	George	Palmer

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Cascading Update

- ▸ Now change "LEC11348" to "LEC11349"

Student | Lecturer

Lecturer ID	Title
⊞ LEC11348	Associate Profes
⊞ LEC23720	Professor
⊞ LEC36231	Lecturer
⊞ LEC66451	Assistant Profess

➡ **LEC11349**

- • **After saving the table, the related records in the student table also change**
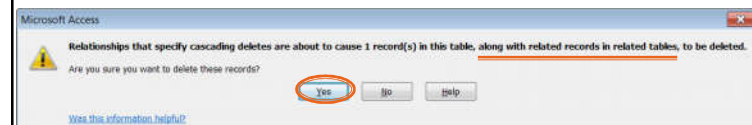
Student

Student ID	First Name	Advisor ID
500123456	Ascending	LEC23720
555555555	Niranaam	LEC23720
570883775	Ralph	LEC11349
570899998	Paul	LEC36231
571123456	Rahul	LEC66451
571314159	Pi	LEC11349
571634633	Michael	LEC11349
571645508	Jane	LEC36231
571888555	Laura	LEC36231

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Cascading Delete [1]

Lecturer

Lecturer ID	Title
⊞ LEC11349	Associate Pro
⊞ LEC23720	Professor
⊞ LEC36231	Lecturer
⊟ LEC66451	Assistant Pro

Student ID	First Nar
571123456	Rahul
*	

- ▸ Delete the Record with PK = LEC66451
  - ◦ Notice the related Student Record (Rahul)

Microsoft Access

⚠ Relationships that specify cascading deletes are about to cause 1 record(s) in this table, along with related records in related tables, to be deleted.
Are you sure you want to delete these records?

Yes   No   Help

Was this information helpful?

along with related records in related tables, to be deleted.

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Cascading Delete [2]

‣ Now the related record is also deleted

Student ID	First Name	Advisor ID
500123456	Ascending	LEC23720
555555555	Niranaam	LEC23720
570883775	Ralph	LEC11349
570899998	Paul	LEC36231
571314159	Pi	LEC11349
571634633	Michael	LEC11349
571645508	Jane	LEC36231
571888555	Laura	LEC36231

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Creating a Query

‣ To create a query: at the Show Table dialog box, add only the tables related to the query.
  ◦ If the query involves data in Student table only without referring to the Lecturer table, add only the Student table
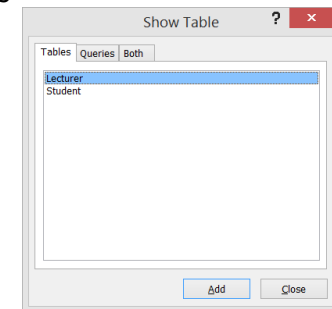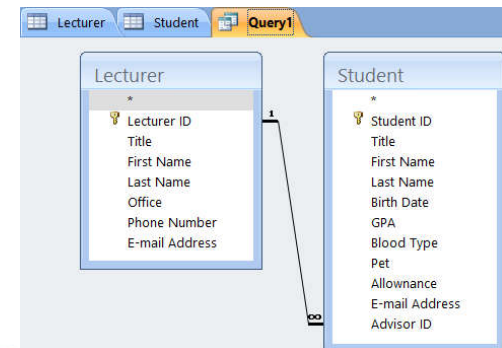
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Query Practice V

‣ Create a query to find all female students and male students from the Faculty of Law(20)
  ◦ Showing
    ▪ Names, student ID, and GPA
  ◦ Sorted by GPA (ascending)

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Creating a Query [2]

‣ If querying involves data in the lecturer table, we need to add the Lecturer table also.

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Query Practice VII

▸ Create a query to list the name of students whose advisors are professors
  ◦ Showing student ID, name, and GPA
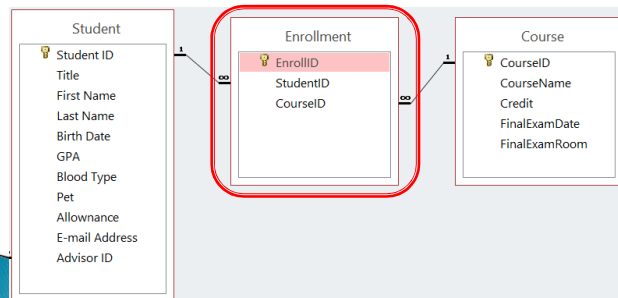 ◦ Sorted by last name – descending

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Query Practice VIII

▸ Create a query for students with GPA higher than 2.75 and having advisors w/ office in building 4 (Office:A4XX)
  ◦ Showing (Students') Name, and the advisors' office number and GPA
  ◦ Remember wildcard? (* and ?)

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Many–to–Many Relationship

▸ Need to create an intermediate table to handle the relationship
▸ In *13_Students_Class_rel.accdb*:

Student	Enrollment	Course
🔑 Student ID	🔑 EnrollID	🔑 CourseID
Title	StudentID	CourseName
First Name	CourseID	Credit
Last Name		FinalExamDate
Birth Date		FinalExamRoom
GPA		
Blood Type		
Pet		
Allowance		
E-mail Address		
Advisor ID		

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Summary

▸ Creating a Relationship
  ◦ Where to put foreign key?
▸ Removing a Relationship
▸ Enforcing Referential Integrity
▸ Cascading Update/Delete
▸ Querying on related tables

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