

File Edit View History Bookmarks Tools Help

Notes on Relational Databases: +

www.pgrocer.net/Cis54/relation.html

Search

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Notes on Relational Databases:

A database can consist of multiple tables/files. These tables/files are related to each other in some way so that the programmer or developer can access information from multiple table/files at the same time. A database management system is the database and its functionality. In today's PC environment, the model of relating the table/files within a database is the relational database model. Things that must be considered in a relational database:

- Analyze the data and determine how to design the files - consider whether the data is in a one to one relationship, a one to many relationship or a many to many relationship.
- Consider functional dependence: An attribute B, is functionally depended on another attribute, A if a value for A determines a single value for B at any one time.
- The primary key has all attributes in the table functionally dependent upon it - to simplify you can think of the primary key as the minimum collection of fields that will get you one and only one record from the table/file.
- We must also consider the rules of normalization and establish the relationships so that the database is in third normal form.
- A relation is in **first normal form** if it does not contain repeating groups.
- A relation is in **second normal form** if it is in first normal form and no non-key attribute is dependent on only a portion of the primary key. (Note: an attribute is a non-key attribute if it is not a part of the primary key).
- A relation is in **third normal form** if it is in second normal form and if the only determinants it contains are candidate keys. (Note: any attribute that determines another attribute is called a determinant).

Tables:

Stutable

Primary key: Stuid

Attributes: Stuname, Stuaddr

Stvcrs

Primary key: Stuid, Crsno

Attributes: Semyr, grade

PK

III 120 F14 F

III 120 S15 B

III 121 F14 C

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Tables:

Stutable
 Primary key \rightarrow Stuid
 Stuname
 Stuaddr

Stu crs

PK
 Stuid
 Crsno
 Semyr

grader
~~Crsgname~~

Crstable
 PK \rightarrow Crsno
 Crsname

III	120	F14	F
III	120	S15	B
III	121	F14	C

depends
 on Crsno
 so I can't
 have it

File Edit View History Bookmarks Tools Help

Notes on Relational Databases: +

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Most Visited

Notes on Relational Databases:

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- A relation is in **third normal form** if it is in second normal form and if the only determinants it contains are candidate keys. (Note: any attribute that determines another attribute is called a determinant).

Tables:

Stutable

Primary key → Stvid

Stuname
Stuaddr
Ssno
Majorcd
Majorname

Stvcrs

PK → Stvid

Stvid
Crsno
Semyr
Grade
Crsname

Crstable

PK → Crsno

Crsname
credits

link

depends on crs
5. I can't have it

PK → major

PK → majorcd

majorname

III	120	F14	F
III	120	S15	B
III	121	F14	C

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

Grocer, Priscilla

FILE **HOME** **CREATE** **EXTERNAL DATA** **DATABASE TOOLS**

View Paste Cut Copy Format Painter

Filter Ascending Selection Descending Advanced Totals Spelling

Remove Sort Toggle Filter New Save More

Find Replace Go To Select All

Sort & Filter Records Find Text Formatting

All Tables

Student **Department** **StudentCourse** **Course**

Student : Table Department : Table StudentCourse : Table Course : Table

major

Ready NUM LOCK

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2010) ? - X
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FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS DESIGN

Views Primary Key Test Validation Rules Modify Lookups Property Indexes Sheet Show/Hide Create Data Macros Rename/ Delete Macro Field, Record & Table Events Relationships Object Dependencies Relationships

All Tables Student

	Field Name	Data Type	Description (Optional)
1	StudentId	Short Text	
2	StudentName	Short Text	
3	StudentCity	Short Text	
4	StudentState	Short Text	
5	DeptCode	Short Text	
6	StudentGPA	Number	

Field Properties

General Lookup

Field Size	5
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	Yes
Allow Zero Length	Yes
Indexed	Yes (No Duplicates)
Unicode Compression	No
IME Mode	No Control
IME Sentence Mode	None
Text Align	General

The field description is optional. It helps you describe the field and is also displayed in the status bar when you select this field on a form.
Press F1 for help on descriptions.

Design view. F6 = Switch panes. F1 = Help. NUM LOCK

11:34 AM 4/23/2015

Windows Taskbar icons: Internet Explorer, File Explorer, Movie Player, Firefox, Access, and others.

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS TABLE TOOLS DESIGN student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 20... ? - X

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View Primary Key Builder Test Validation Rules Tools

All Tables

Student : Table
Department : Table
StudentCourse : Table
Course : Table

StudentCourse

Field Name	Data Type	Description (Optional)
StudentId	Short Text	
CourseNumber	Short Text	
SemYr	Short Text	
Grade	Short Text	

Note that the key consists of three fields you can highlight them all and click the key button.

Field Properties

General Lookup

A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

Design view. F6 = Switch panes. F1 = Help.

NUM LOCK

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FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS TABLE TOOLS student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 20... ? - X

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View Primary Builder Test Validation Rules

Insert Rows Delete Rows Modify Lookups Property Indexes Sheet Show/Hide Create Data Macros Rename/Delete Macro Relationships Object Dependencies

All Tables

Student

Student : Table

Department

Department : Table

StudentCourse

StudentCourse : Table

Course

Course : Table

Student Course

Field Name Data Type Description (Optional)

CourseNumber Short Text

CourseName Short Text

NumCredits Number

Field Properties

General Lookup

A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

Design view. F6 = Switch panes. F1 = Help.

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Views Primary Key Tools

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2013) ? - Grocer, Priscilla

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS TABLE TOOLS DESIGN

View Primary Builder Test Validation Rules Modify Lookups Property Indexes Sheet Create Data Macros Rename/Delete Macro Relationships Object Dependencies

All Tables Student Department StudentCourse Course Department

Field Name	Data Type	Description (Optional)
DeptCode	Short Text	
DepartmentName	Short Text	
DepartmentChair	Short Text	

Field Properties

General Lookup

The field description is optional. It helps you describe the field and is also displayed in the status bar when you select this field on a form. Press F1 for help on descriptions.

Design view. F6 = Switch panes. F1 = Help.

NUM LOCK

11:37 AM 4/23/2015

Views Primary Key Tools

Student : Table Department : Table StudentCourse : Table Course : Table

Field, Record & Table Events Relationships

Relationships

Field Properties

General Lookup

The field description is optional. It helps you describe the field and is also displayed in the status bar when you select this field on a form. Press F1 for help on descriptions.

Design view. F6 = Switch panes. F1 = Help.

NUM LOCK

11:37 AM 4/23/2015

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

Grocer, Priscilla

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS

View Cut Copy Format Painter
Paste Refresh All
Views Clipboard Filter Advanced
Remove Sort More
Ascending Descending Toggle Filter

New Totals ABC Spelling
Save Find ab ac Replace Go To
Delete Select

Calibri 11 Text Formatting

All Tables

Student Student : Table
Department Department : Table
StudentCourse StudentCourse : Table
Course Course : Table

Query1

StudentId	StudentName	Student.DeptCode	Department.DeptCode	Department
11111	Jane Costa	CI	CI	Computer Info
12345	John Doe	CI	CI	Computer Info
23456	Linda Brown	CI	CI	Computer Info
22222	David Smith	BU	BU	Business Admi
33333	James Souza	BU	BU	Business Admi

Record: 14 1 of 5 No Filter Search

Ready NUM LOCK SQL

11:42 AM 4/23/2015

The screenshot shows a Microsoft Access application window. The ribbon tabs are FILE, HOME, CREATE, EXTERNAL DATA, and DATABASE TOOLS. The HOME tab is selected. On the left, the 'All Tables' pane lists four tables: Student, Department, StudentCourse, and Course. The StudentCourse table is currently selected, highlighted with a pink background. In the center, a query result grid titled 'Query1' displays five student records. The columns are StudentId, StudentName, Student.DeptCode, Department.DeptCode, and Department. The data shows students Jane Costa, John Doe, Linda Brown, David Smith, and James Souza, each assigned to either the Computer Info or Business Admi department. The status bar at the bottom indicates 'Record: 14 1 of 5' and shows the date and time as 4/23/2015 11:42 AM.

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2... ? - □ X Grocer, Priscilla

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS DESIGN

View Run Select Make Append Update Crosstab Delete Union Pass-Through Data Definition Insert Rows Insert Columns Delete Rows Delete Columns Builder Show Table Query Type Query Setup Totals Parameters XYZ Table Names Return: All Show/Hide

All Tables

Student Student : Table

Department Department : Table

StudentCourse StudentCourse : Table

Course Course : Table

Query1

Student

StudentId
StudentName
StudentCity
StudentState
DeptCode
StudentGPA

Department

* DeptCode
DepartmentName
DepartmentChair

For the output for the previous slide, I did not have the CI under DeptCode. If you look at the next slide, you will see the impact.

Field: StudentId StudentName DeptCode DeptCode DepartmentName
Table: Student Student Student Department Department
Sort:
Show:
Criteria: "CI"
or:

Ready

NUM LOCK SQL

11:43 AM 4/23/2015

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

Grocer, Priscilla

FILE **HOME** **CREATE** **EXTERNAL DATA** **DATABASE TOOLS**

View **Paste** **Format Painter**

Clipboard

Filter **Ascending** **Descending** **Selection** **Advanced** **Refresh** **New** **Totals** **Spelling**

Remove Sort **Toggle Filter** **All** **Save** **Replace** **Find** **Go To** **Select**

Records **Text Formatting**

Find

Text Formatting

Calibri **11**

All Tables

Student

Student : Table

Department

Department : Table

StudentCourse

StudentCourse : Table

Course

Course : Table

Query1

StudentId	StudentName	Student.DeptCode	Department.DeptCode	Department
11111	Jane Costa	CI	CI	Computer Info
12345	John Doe	CI	CI	Computer Info
23456	Linda Brown	CI	CI	Computer Info

Record: 1 of 3

No Filter

Search

Ready

NUM LOCK

SQL

11:43 AM
4/23/2015



student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

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All Tables

- Student
 - Student : Table
 - studept
- Department
 - Department : Table
 - studept
- StudentCourse
 - StudentCourse : Table
- Course
 - Course : Table

When I link these table, I can link the idno on the student table to the idno on the studentcourse table and I can link the crsno on the student course table to the crsno on the course table.

Student Student course course table

I&nd
name Idno
 Crsno
 Semyr

 Crsno
 Crsname

Ready

NUM LOCK

Screenshot of Microsoft Access 2013 Query Designer showing the creation of a query named "Query1".

The "DESIGN" tab is selected in the ribbon.

The "Query Type" dropdown shows "Select".

The "Show Table" button is highlighted.

The "Return: All" dropdown is set to "All".

The "Table Names" button is highlighted.

The "Query1" query is displayed in the main pane, showing three tables:

- Student**: Contains fields: StudentId (Primary Key), StudentName, StudentCity, StudentState, DeptCode.
- StudentCourse**: Contains fields: StudentId (Foreign Key), CourseNumber, SemYr, Grade.
- Course**: Contains fields: CourseNumber, CourseName, NumCredits.

A relationship line connects the StudentId field in the Student table to the StudentId field in the StudentCourse table.

The "Field", "Table", "Sort", "Criteria", and "or:" sections of the query grid are visible, but no specific fields have been added yet.

Note: Note that when I set up a query I need the lines to link the fields. On the last one I apparently did not take picture of the development. So here they are. If the lines are not there then you can drag CourseNumber from one table on top of the CourseNumber field on the other table.

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2...)

Grocer, Priscilla

FILE **HOME** **CREATE** **EXTERNAL DATA** **DATABASE TOOLS** **QUERY TOOLS** **DESIGN**

View Run Select Make Table Append Update Crosstab Delete Data Definition

Insert Rows Insert Columns Delete Rows Delete Columns Builder

Query Setup

Return: All

Totals Parameters Table Names

Show/Hide

All Tables

Student

- Student : Table
- studept

Department

- Department : Table
- studept

StudentCourse

- StudentCourse : Table

Course

- Course : Table

Query1

Query Type

Student StudentCourse Course

Field: Table: Sort: Show: Criteria: or:

Ready

NUM LOCK SQL

11:50 AM 4/23/2015

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2... ? - 

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS DESIGN

View Run Select Make Table Append Update Crosstab Delete Data Definition

Insert Rows Insert Columns Delete Rows Delete Columns Builder Return: All Totals Parameters Table Names

Query Type Show Table Query Setup Show/Hide

All Tables

Student Student : Table
studept
Department Department : Table
studept
StudentCourse StudentCourse : Table
Course Course : Table

Query1

Student *
StudentId
StudentName
StudentCity
StudentState
DeptCode

StudentCourse *
StudentId
CourseNumber
SemYr
Grade

Course *
CourseNumber
CourseName
NumCredits

If the links are not there you will get every possible combination.

Field: StudentId StudentName StudentId CourseNumber SemYr CourseNumber CourseName
Table: Student Student StudentCourse StudentCourse StudentCourse Course Course
Sort:
Show:
Criteria:
or:

Ready NUM LOCK SQL  11:51 AM 4/23/2015

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

HOME CREATE EXTERNAL DATA DATABASE TOOLS

View Cut Copy Format Painter
Paste Refresh All Selection Advanced Totals Spelling
Remove Sort Toggle Filter New Save More Find abc Replace Go To Select
B I U ab Text Formatting

All Tables

Student

- Student : Table
- studentpt

Department

- Department : Table
- studentpt

StudentCourse

- StudentCourse : Table

Course

- Course : Table

Query1

Student.StuID	StudentName	StudentCourseID	StudentCourse	SemYr	Course.CourseID	CourseName
11111	Jane Costa	11111	CIS120	S10	ACC111	Accounting I
12345	John Doe	11111	CIS120	S10	ACC111	Accounting I
22222	David Smith	11111	CIS120	S10	ACC111	Accounting I
23456	Linda Brown	11111	CIS120	S10	ACC111	Accounting I
33333	James Souza	11111	CIS120	S10	ACC111	Accounting I
11111	Jane Costa	11111	CIS120	S10	CIS120	Programming I
12345	John Doe	11111	CIS120	S10	CIS120	Programming I
22222	David Smith	11111	CIS120	S10	CIS120	Programming I
23456	Linda Brown	11111	CIS120	S10	CIS120	Programming I
33333	James Souza	11111	CIS120	S10	CIS120	Programming I
11111	Jane Costa	11111	CIS120	S10	CIS121	Operating Syst
12345	John Doe	11111	CIS120	S10	CIS121	Operating Syst
22222	David Smith	11111	CIS120	S10	CIS121	Operating Syst
23456	Linda Brown	11111	CIS120	S10	CIS121	Operating Syst
33333	James Souza	11111	CIS120	S10	CIS121	Operating Syst
11111	Jane Costa	11111	CIS120	S10	MAR111	Marketing
12345	John Doe	11111	CIS120	S10	MAR111	Marketing
22222	David Smith	11111	CIS120	S10	MAR111	Marketing
23456	Linda Brown	11111	CIS120	S10	MAR111	Marketing
33333	James Souza	11111	CIS120	S10	MAR111	Marketing
11111	Jane Costa	11111	CIS120	S10	CIS122	Internet Devel
12345	John Doe	11111	CIS120	S10	CIS122	Internet Devel
22222	David Smith	11111	CIS120	S10	CIS122	Internet Devel
23456	Linda Brown	11111	CIS120	S10	CIS122	Internet Devel
33333	James Souza	11111	CIS120	S10	CIS122	Internet Devel
11111	Jane Costa	11111	MAR111	S10	ACC111	Accounting I
12345	John Doe	11111	MAR111	S10	ACC111	Accounting I
22222	David Smith	11111	MAR111	S10	ACC111	Accounting I
23456	Linda Brown	11111	MAR111	S10	ACC111	Accounting I
33333	James Souza	11111	MAR111	S10	ACC111	Accounting I
11111	Jane Costa	11111	MAR111	S10	CIS120	Programming I
12345	John Doe	11111	MAR111	S10	CIS120	Programming I
22222	David Smith	11111	MAR111	S10	CIS120	Programming I
23456	Linda Brown	11111	MAR111	S10	CIS120	Programming I
33333	James Souza	11111	MAR111	S10	CIS120	Programming I
11111	Jane Costa	11111	MAR111	S10	CIS121	Operating Syst
12345	John Doe	11111	MAR111	S10	CIS121	Operating Syst
22222	David Smith	11111	MAR111	S10	CIS121	Operating Syst

Record: 14 < 1 of 250 > No Filter Search

NUM LOCK SQL

Ready

Windows Internet Explorer Mozilla Firefox Microsoft Word Microsoft Access

11:51 AM 4/23/2015

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2013)

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FILE **HOME** **CREATE** **EXTERNAL DATA** **DATABASE TOOLS** **QUERY TOOLS** DESIGN

View Run Select Make Append Update Crosstab Delete Show Table Builder Query Setup Show/Hide

Insert Rows Insert Columns Delete Rows Delete Columns Return: All Totals Parameters Table Names

All Tables

Student: Student : Table
Department: Department : Table
StudentCourse: StudentCourse : Table
Course: Course : Table

Query1

Query Type

Student Course Course

When I link them then I only get things with a matching studentid and a matching coursenumber.

Field: StudentId StudentName StudentId CourseNumber SemYr CourseNumber CourseName
Table: Student Student StudentCourse StudentCourse Student Course Course
Sort:
Show:
Criteria:
or:

Ready

NUM LOCK SQL

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student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

Grocer, Priscilla

FILE **HOME** **CREATE** **EXTERNAL DATA** **DATABASE TOOLS**

View **Cut** **Copy** **Format Painter**
Paste **Views** **Clipboard**

Filter **Ascending** **Descending** **Selection** **Advanced**
Remove Sort **Toggle Filter**

New **Totals** **Spelling**
Refresh **All** **More**

Find **Replace** **Go To** **Select**

Calibri **11** **Text Formatting**

All Tables

Student **Department** **StudentCourse** **Course**

Query1

Student.StuID	StudentName	StudentCourse	StudentCourse	SemYr	Course.Course	CourseName
11111	Jane Costa	11111	CIS120	S10	CIS120	Programming L
11111	Jane Costa	11111	MAR111	S10	MAR111	Marketing
12345	John Doe	12345	CIS121	F09	CIS121	Operating Syst
22222	David Smith	22222	CIS122	F09	CIS122	Internet Devel
22222	David Smith	22222	ACC111	F09	ACC111	Accounting I
23456	Linda Brown	23456	CIS120	F09	CIS120	Programming L
23456	Linda Brown	23456	CIS121	F09	CIS121	Operating Syst
33333	James Souza	33333	ACC111	F09	ACC111	Accounting I
33333	James Souza	33333	ACC111	S10	ACC111	Accounting I
33333	James Souza	33333	MAR111	S10	MAR111	Marketing
*						

Record: 1 of 10 | No Filter | Search

Ready NUM LOCK SQL

11:52 AM 4/23/2015

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS QUERY TOOLS student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2... ? - X

View Run Select Make Append Update Crosstab Delete Union Pass-Through Data Definition Show Table Insert Rows Insert Columns Delete Rows Delete Columns Builder Return: All Totals Parameters XYZ Table Names

All Tables Student Student : Table studept Department Department : Table studept StudentCourse StudentCourse : Table Course Course : Table

Query1

Student CourseNumber CourseName NumCredits

StudentCourse

Student

Course

Now I am asking for two things in an AND relationship. So in addition to linking, I am also asking for CIS121 and F09.

Field:	StudentId	StudentName	StudentId	CourseNumber	SemYr	CourseNumber	CourseName
Table:	Student	Student	StudentCourse	StudentCourse	StudentCourse	Course	Course
Show:	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
Criteria:				"CIS121"	"F09"		
or:							

Ready NUM LOCK SQL

11:53 AM 4/23/2015

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

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FILE **HOME** **CREATE** **EXTERNAL DATA** **DATABASE TOOLS**

View **Cut** **Copy** **Format Painter**
Paste **Views** **Clipboard**

Filter **Ascending** **Selection**
Descending **Advanced**
Remove Sort **Toggle Filter**

New **Save** **Totals** **Spelling**
Refresh **Replace**
All **Delete** **More**

Find **Go To**
Select

Text Formatting

Calibri **11**

B **I** **U** **A**

All Tables

Student
Student : Table

Department
Department : Table

StudentCourse
StudentCourse : Table

Course
Course : Table

Query1

Student.Stu	StudentNam	StudentCoul	StudentCoul	SemYr	Course.Cour	CourseName
12345	John Doe	12345	CIS121	F09	CIS121	Operating Syst
23456	Linda Brown	23456	CIS121	F09	CIS121	Operating Syst
*						

Record: 1 of 2

No Filter

Search

Ready

NUM LOCK

SQL

11:53 AM
4/23/2015



student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2013) ? - Grocer, Priscilla

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS DESIGN

View Run Select Make Append Update Crosstab Delete Union Pass-Through Data Definition

Insert Rows Insert Columns Delete Rows Delete Columns Builder Return: All

Property Sheet Table Names

Totals Parameters Show/Hide

All Tables

Student : Table
studept
Department : Table
studept
StudentCourse : Table
Course : Table

Query1

Diagram showing three tables: Student, StudentCourse, and Course. The Student table has fields: * StudentId, StudentName, StudentCity, StudentState, DeptCode. The StudentCourse table has fields: * StudentId, CourseNumber, SemYr, Grade. The Course table has fields: * CourseNumber, CourseName, NumCredits. There are relationships between Student and StudentCourse, and between StudentCourse and Course.

Field: StudentId StudentName StudentId CourseNumber SemYr CourseNumber CourseName
Table: Student Student StudentCourse StudentCourse StudentCourse Course Course
Sort:
Show:
Criteria: or:
"CIS121" "F09"

Ready

NUM LOCK SQL

11:54 AM 4/23/2015

```
graph LR; Student[Student] --- SC[StudentCourse]; SC --- Course[Course]
```

Field:	StudentId	StudentName	StudentId	CourseNumber	SemYr	CourseNumber	CourseName
Table:	Student	Student	StudentCourse	StudentCourse	StudentCourse	Course	Course
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:	or: "CIS121" "F09"						

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS

View Cut Copy Paste Format Painter

Filter Ascending Selection Descending Advanced

New Totals Spelling

Refresh All Save More

Find Replace Go To Select

Text Formatting

All Tables

Student : Table

studept

Department : Table

studept

StudentCourse : Table

Course : Table

Query1

StudentId	StudentName	CourseNum	SemYr	CourseName
12345	John Doe	CIS121	F09	Operating Syst
23456	Linda Brown	CIS121	F09	Operating Syst
*				

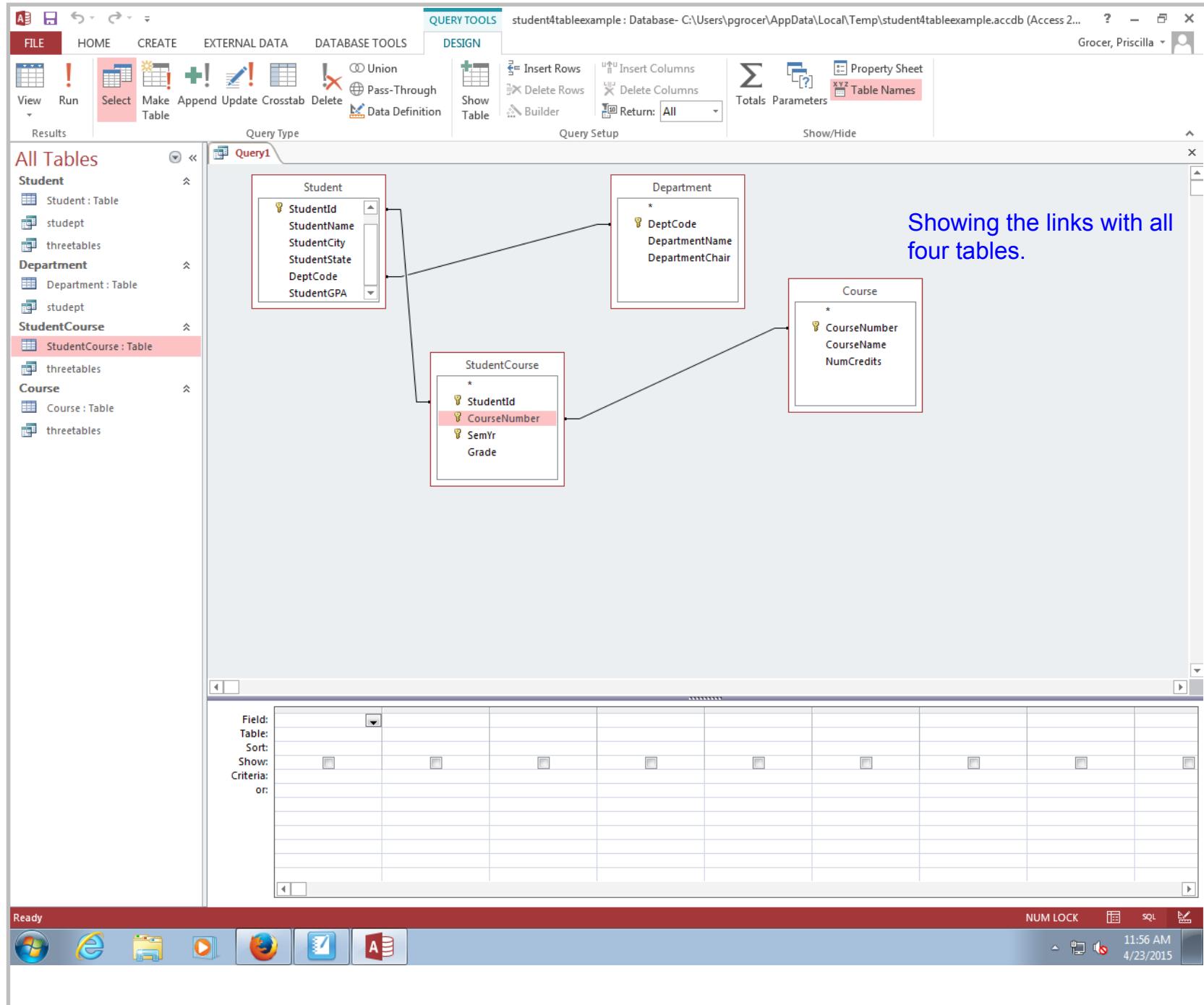
Record: 1 of 2 No Filter Search

Ready NUM LOCK SQL

11:55 AM 4/23/2015

The screenshot shows a Microsoft Access 2013 application window. The ribbon at the top has tabs for FILE, HOME, CREATE, EXTERNAL DATA, and DATABASE TOOLS. The HOME tab is selected. On the left, a navigation pane titled 'All Tables' lists several tables: Student, studept, Department, studept, StudentCourse, and Course. The 'StudentCourse' table is currently selected, indicated by a pink highlight. The main area contains a query window titled 'Query1' showing a grid of data. The columns are labeled 'StudentId', 'StudentName', 'CourseNum', 'SemYr', and 'CourseName'. The data shows two rows of information. The bottom status bar indicates 'Record: 1 of 2' and 'No Filter'. The taskbar at the bottom shows icons for various Windows applications like Internet Explorer, File Explorer, and Mozilla Firefox.

Title: Apr 23-11:55 AM (22 of 38)



student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2013)

Grocer, Priscilla

FILE **HOME** **CREATE** **EXTERNAL DATA** **DATABASE TOOLS** **QUERY TOOLS** **DESIGN**

View Run Select Make Table Append Update Crosstab Delete Union Pass-Through Data Definition Show Table Insert Rows Insert Columns Delete Rows Delete Columns Builder Return: All Totals Parameters Table Names

Query Type **Query1**

All Tables

- Student**
 - Student : Table
 - studept
 - threeTables
- Department**
 - Department : Table
 - studept
- StudentCourse**
 - StudentCourse : Table**
 - threeTables
- Course**
 - Course : Table
 - threeTables

```

    graph LR
        Student[Student] --- SC[StudentCourse]
        SC --- Course[Course]
        Student --- Dept[Department]
    
```

*fields I link
need same type
& size*

Field: Table: Sort: Show: Criteria: or:

Ready NUM LOCK SQL

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2013) ? - X

Grocer, Priscilla

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS DESIGN

View Run Select Make Table Append Update Crosstab Delete Data Definition Insert Rows Insert Columns Delete Rows Delete Columns Builder Return: All Totals Parameters Table Names

Results Query Type Query Setup Show/Hide

All Tables

Student : Table
studept
threeTables

Department : Table
studept

StudentCourse : Table
threeTables

Course : Table
threeTables

Query1

Diagram View:

```
graph LR; Student[Student] --- SC[StudentCourse]; SC --- Course[Course]; SC --- Dept[Department]
```

Field: StudentId, StudentName, CourseNumber, SemYr, Grade, CourseName, DepartmentName
Table: Student, StudentCourse, Course, Department
Sort:
Show:
Criteria:

Ready

NUM LOCK SQL

12:00 PM 4/23/2015

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

Grocer, Priscilla

FILE **HOME** **CREATE** **EXTERNAL DATA** **DATABASE TOOLS**

View **Cut** **Copy** **Format Painter**
Paste **Clipboard**

Filter **Ascending** **Selection** **Totals** **Spelling**
Descending **Advanced** **Refresh** **Replace**
Remove Sort **Toggle Filter** **All** **New** **Save** **Find** **Go To** **Select**
Records **More** **Find** **Text Formatting**

Calibri **11** **B** **I** **U** **A** **Font** **Text Box** **Table** **Image** **Text Box** **Table** **Image**

All Tables

Student
Student : Table
studept
threetables

Department
Department : Table
studept

StudentCourse
StudentCourse : Table
threetables

Course
Course : Table
threetables

Query1

StudentId	StudentName	CourseNum	SemYr	Grade	CourseName	Department
11111	Jane Costa	CIS120	S10	A	Programming I	Computer Info
11111	Jane Costa	MAR111	S10	B	Marketing	Computer Info
12345	John Doe	CIS121	F09	B	Operating Syst	Computer Info
22222	David Smith	ACC111	F09	B	Accounting I	Business Admi
22222	David Smith	CIS122	F09	C	Internet Devel	Business Admi
23456	Linda Brown	CIS120	F09	A	Programming I	Computer Info
23456	Linda Brown	CIS121	F09	A-	Operating Syst	Computer Info
33333	James Souza	ACC111	F09	F	Accounting I	Business Admi
33333	James Souza	ACC111	S10	C	Accounting I	Business Admi
33333	James Souza	MAR111	S10	C	Marketing	Business Admi

Record: 14 of 10 | No Filter | Search |

Ready NUM LOCK SQL

Windows Taskbar: Internet Explorer, Firefox, Microsoft Word, Microsoft Access, 12:00 PM, 4/23/2015

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2013)

Grocer, Priscilla

FILE **HOME** **CREATE** **EXTERNAL DATA** **DATABASE TOOLS** **QUERY TOOLS** **DESIGN**

View Run **Select** Make Table Append Update Crosstab Delete Union Pass-Through Data Definition Show Table

Results **Query Type** **Query Setup** **Show/Hide**

Insert Rows Insert Columns Delete Rows Delete Columns Builder Return: All Totals Parameters Table Names

All Tables

- Student**
 - Student : Table
 - studept
 - threetables
- Department**
 - Department : Table
 - studept
 - threetables
- StudentCourse**
 - StudentCourse : Table**
 - threetables
- Course**
 - Course : Table
 - threetables

Query1

Field: StudentId
Table: Student
Sort: StudentName
Show:
Criteria: or:

Field:	StudentId	StudentName	CourseNumber	SemYr	Grade	CourseName	DepartmentName	DeptCode
Table:	Student	Student	StudentCourse	StudentCourse	StudentCourse	Course	Department	Student
Sort:								
Show:	<input checked="" type="checkbox"/>							
Criteria:								

Ready

NUM LOCK SQL

12:00 PM 4/23/2015

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

Grocer, Priscilla

FILE **HOME** CREATE EXTERNAL DATA DATABASE TOOLS

View Cut Copy Format Painter
Paste
Views Clipboard

Filter Ascending Selection Descending Advanced Remove Sort Toggle Filter

New Totals Refresh All Save Spelling Find Replace Go To Select

Find Text Formatting

All Tables

- Student**
 - Student : Table
 - studept
 - threetables
- Department**
 - Department : Table
 - studept
- StudentCourse**
 - StudentCourse : Table
 - threetables
- Course**
 - Course : Table
 - threetables

Query1

StudentId	StudentName	CourseNum	SemYr	Grade	CourseName	Department	DeptCode
11111	Jane Costa	CIS120	S10	A	Programming I	Computer Info	CI
11111	Jane Costa	MAR111	S10	B	Marketing	Computer Info	CI
12345	John Doe	CIS121	F09	B	Operating Syst	Computer Info	CI
22222	David Smith	ACC111	F09	B	Accounting I	Business Adm	BU
22222	David Smith	CIS122	F09	C	Internet Devel	Business Adm	BU
23456	Linda Brown	CIS120	F09	A	Programming I	Computer Info	CI
23456	Linda Brown	CIS121	F09	A-	Operating Syst	Computer Info	CI
33333	James Souza	ACC111	F09	F	Accounting I	Business Adm	BU
33333	James Souza	ACC111	S10	C	Accounting I	Business Adm	BU
33333	James Souza	MAR111	S10	C	Marketing	Business Adm	BU

*

Next I asked the class to try this one. CI has to be true and either of the other two also has to be true.

CI and either CIS120
 or
 B

Record: 14 < 1 of 10 > No Filter Search

Ready NUM LOCK SQL

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2...)

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS DESIGN

View Run Select Make Table Append Update Crosstab Delete Data Definition

Show Table Insert Rows Insert Columns Delete Rows Delete Columns Builder Return: All Totals Parameters

Query Type Query Setup Show/Hide

All Tables

Student

- Student : Table
- studept
- threetables

Department

- Department : Table
- studept
- threetables

StudentCourse

- StudentCourse : Table
- threetables

Course

- Course : Table
- threetables

Query1

Diagram showing relationships between Student, StudentCourse, Course, and Department tables.

```

    graph LR
        Student[Student] ---> StudentCourse[StudentCourse]
        StudentCourse ---> Course[Course]
        StudentCourse ---> Department[Department]
    
```

Query Criteria:

Field:	StudentId	StudentName	CourseNumber	SemYr	Grade	CourseName	DepartmentName	DeptCode
Table:	Student	Student	StudentCourse	StudentCourse	StudentCourse	Course	Department	Student
Sort:	<input checked="" type="checkbox"/>							
Show:								
Criteria:			"CIS120"					
or:				"B"				

Remember from when we first did Access, the thing that has to be true is put on both lines. And the either of two other things means one is on the criteria line and one is on the or line. So if I look at the criteria line it has CIS120 and CI major and if I look at the or line it has B and CI major.

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

Grocer, Priscilla

FILE **HOME** CREATE EXTERNAL DATA DATABASE TOOLS

View Paste Cut Copy Format Painter
Clipboard

Filter Ascending Descending Remove Sort Advanced Toggle Filter

New Save Totals Spelling Refresh All Delete More

Replace Go To Select Find

Calibri 11 Text Formatting

All Tables

Student

- Student : Table
- studept
- threetables

Department

- Department : Table
- studept

StudentCourse

- StudentCourse : Table
- threetables

Course

- Course : Table
- threetables

Query1

StudentId	StudentName	CourseNum	SemYr	Grade	CourseName	Department	DeptCode
11111	Jane Costa	CIS120	S10	A	Programming	Computer Info	CI
11111	Jane Costa	MAR111	S10	B	Marketing	Computer Info	CI
12345	John Doe	CIS121	F09	B	Operating Syst	Computer Info	CI
23456	Linda Brown	CIS120	F09	A	Programming	Computer Info	CI

Record: 1 of 4 No Filter Search

Ready NUM LOCK SQL

12:06 PM 4/23/2015

This screenshot shows a Microsoft Access window titled "student4tableexample". The "HOME" tab is selected in the ribbon. On the left, the "All Tables" pane is open, showing tables like Student, Department, and StudentCourse. The "StudentCourse" table is currently selected. The main area displays a query results grid titled "Query1" with four records. The columns are: StudentId, StudentName, CourseNum, SemYr, Grade, CourseName, Department, and DeptCode. The first record shows a student named Jane Costa taking CIS120 in S10 with grade A, while the second record shows her taking MAR111 in S10 with grade B. The third record is for John Doe in CIS121 F09, and the fourth record is for Linda Brown in CIS120 F09. The status bar at the bottom shows "Record: 1 of 4" and "No Filter". The taskbar at the bottom includes icons for File Explorer, Internet Explorer, Task View, and File Explorer.

Title: Apr 23-12:06 PM (30 of 38)

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

Grocer, Priscilla

Query1

StudentId	StudentName	CourseNum	SemYr	Grade	CourseName	Department	DeptCode
11111	Jane Costa	CIS120	S10	A	Programming	Computer Info	CI
11111	Jane Costa	MAR111	S10	B	Marketing	Computer Info	CI
12345	John Doe	CIS121	F09	B	Operating Syst	Computer Info	CI
23456	Linda Brown	CIS120	F09	A	Programming	Computer Info	CI

Handwritten annotations:

- A blue curly arrow points from the value "CIS120" in the CourseNum column of the first row to the value "CIS120" in the CourseNum column of the fourth row.
- A blue curly arrow points from the value "B" in the Grade column of the second row to the value "B" in the Grade column of the third row.
- A large blue arrow points upwards from the bottom of the table towards the word "all".
- The word "all" is written vertically next to the upward-pointing arrow.

Record: 1 of 4 | No Filter | Search

Ready NUM LOCK SQL

QUERY TOOLS student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2... ? - □ ×

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS DESIGN

View Run Select Make Append Update Crosstab Delete Pass-Through Data Definition

Insert Rows Insert Columns Delete Rows Delete Columns Builder Return: All

Show Table Property Sheet Table Names

Totals Parameters Show/Hide

Results Query Type Query1

All Tables

- Student**
 - Student : Table
 - studept
 - threetables
- Department**
 - Department : Table
 - studept
 - threetables
- StudentCourse**
 - StudentCourse : Table**
 - threetables
- Course**
 - Course : Table
 - threetables

If I do not put the CI on both the criteria line and the or line then I have a problem. The criteria line still says CIS120 and CI while the or line had just B standing alone so it can be any major.

Field:	StudentId	StudentName	CourseNumber	SemYr	Grade	CourseName	DepartmentName	DeptCode
Table:	Student	Student	StudentCourse	StudentCourse	StudentCourse	Course	Department	Student
Show:	<input checked="" type="checkbox"/>							
Criteria:			"CIS120"					"CI"
or:				"B"				

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2007 - 2013 file format) - Access

HOME CREATE EXTERNAL DATA DATABASE TOOLS

View Cut Copy Format Painter
Paste Views Clipboard

Filter Ascending Selection Descending Advanced Remove Sort Toggle Filter

New Totals Refresh All Delete More

Find Replace Go To Select

Calibri 11 Text Formatting

All Tables

Student Student : Table studept threetables

Department Department : Table studept

StudentCourse StudentCourse : Table threetables

Course Course : Table threetables

Query1

StudentId	StudentName	CourseNum	SemYr	Grade	CourseName	Department	DeptCode
11111	Jane Costa	CIS120	S10	A	Programming I	Computer Info	CI
11111	Jane Costa	MAR111	S10	B	Marketing	Computer Info	CI
12345	John Doe	CIS121	F09	B	Operating Syst	Computer Info	CI
22222	David Smith	ACC111	F09	B	Accounting I	Business Admi	BU
23456	Linda Brown	CIS120	F09	A	Programming I	Computer Info	CI

because CI not on or line

Record: 1 of 5 No Filter Search

Ready NUM LOCK SQL

The screenshot shows a Microsoft Access interface with a query results window titled 'Query1'. The results are displayed in a table with columns: StudentId, StudentName, CourseNum, SemYr, Grade, CourseName, Department, and DeptCode. The last row of the table has a blue arrow pointing to the 'DeptCode' column value 'CI'. Handwritten text next to the arrow reads 'because CI not on or line'.

StudentId	StudentName	CourseNum	SemYr	Grade	CourseName	Department	DeptCode
11111	Jane Costa	CIS120	S10	A	Programming I	Computer Info	CI
11111	Jane Costa	MAR111	S10	B	Marketing	Computer Info	CI
12345	John Doe	CIS121	F09	B	Operating Syst	Computer Info	CI
22222	David Smith	ACC111	F09	B	Accounting I	Business Admi	BU
23456	Linda Brown	CIS120	F09	A	Programming I	Computer Info	CI

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2013)

Grocer, Priscilla

FILE **HOME** **CREATE** **EXTERNAL DATA** **DATABASE TOOLS** **QUERY TOOLS** DESIGN

View Run Select Make Table Append Update Crosstab Delete Union Pass-Through Data Definition Show Table Insert Rows Insert Columns Delete Rows Delete Columns Builder Return: All Totals Parameters

Query Type Query Setup Show/Hide

All Tables

- Student**
 - Student : Table
 - studept
 - threetables
- Department**
 - Department : Table
 - studept
- StudentCourse**
 - StudentCourse : Table
 - threetables
- Course**
 - Course : Table
 - threetables

Query1

```

    graph LR
        Student[Student] ---> StudentCourse[StudentCourse]
        Course[Course] ---> StudentCourse[StudentCourse]
        StudentCourse[StudentCourse] <--> Student[Student]
        StudentCourse[StudentCourse] ---> Department[Department]
    
```

Field: StudentId, StudentName, CourseNumber, SemYr, Grade, CourseName, DepartmentName, DeptCode, Student
Table: Student, Student, StudentCourse, StudentCourse, Course, Course, Department, Student
Sort: StudentId, StudentName, CourseNumber, SemYr, Grade, CourseName, DepartmentName, DeptCode, Student
Show: StudentId, StudentName, CourseNumber, SemYr, Grade, CourseName, DepartmentName, DeptCode, Student
Criteria:
or:

Ready NUM LOCK SQL

12:10 PM 4/23/2015

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 20... ? - □ × Grocer, Priscilla

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS TABLE TOOLS DESIGN

View Primary Key Builder Test Validation Rules Modify Lookups Property Indexes Sheet Create Data Macros Rename/Delete Macro Relationships Object Dependencies

Insert Rows Delete Rows Show/Hide Field, Record & Table Events Relationships

All Tables

Student : Table

fourtables studept threetables

Department : Table

fourtables studept

StudentCourse : Table

fourtables threetables

Course : Table

fourtables threetables

Student

Field Name	Data Type	Description (Optional)
StudentId	Short Text	
StudentName	Short Text	
StudentCity	Short Text	
StudentState	Short Text	
DeptCode	Short Text	
StudentGPA	Number	

Showing that things that are linked need the same type and length.

Field Properties

General Lookup

Field Size	5
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	Yes
Allow Zero Length	Yes
Indexed	Yes (No Duplicates)
Unicode Compression	No
IME Mode	No Control
IME Sentence Mode	None
Text Align	General

A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

Design view. F6 = Switch panes. F1 = Help. NUM LOCK 12:10 PM 4/23/2015

Windows Taskbar icons: Internet Explorer, File Explorer, Media Player, Firefox, Access, and others.

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS TABLE TOOLS DESIGN student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 20... Grocer, Priscilla

View Primary Key Test Validation Rules Modify Lookups Property Indexes Sheet Show/Hide Create Data Macros Rename/Delete Macro Relationships Object Dependencies

All Tables Student Student : Table fourtables studept threetables Department Department : Table fourtables studept StudentCourse StudentCourse : Table fourtables threetables Course Course : Table fourtables threetables

Field Name	Data Type	Description (Optional)
StudentId	Short Text	
CourseNumber	Short Text	
Score	Short Text	
Grade	Short Text	

Field Properties

General Lookup

Field Size	5
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	Yes
Allow Zero Length	Yes
Indexed	No
Unicode Compression	No
IME Mode	No Control
IME Sentence Mode	None
Text Align	General

A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

Design view. F6 = Switch panes. F1 = Help. NUM LOCK 12:10 PM 4/23/2015

Windows Taskbar icons: Start, Internet Explorer, File Explorer, Movie & Music, Firefox, Access, and others.

student4tableexample : Database- C:\Users\pgrocer\AppData\Local\Temp\student4tableexample.accdb (Access 2013)

Grocer, Priscilla

FILE HOME CREATE EXTERNAL DATA DATABASE TOOLS DESIGN

Views Primary Key Builder Test Validation Rules Tools Insert Rows Delete Rows Modify Lookups Property Indexes Sheet Create Data Macros Rename/Delete Macro Relationships Object Dependencies Field, Record & Table Events Relationships

All Tables

Student

- Student : Table
- fourtables
- studept
- threetables

Department

- Department : Table
- fourtables
- studept

StudentCourse

- StudentCourse : Table
- fourtables
- threetables

Course

- Course : Table
- fourtables
- threetables

Design view. F6 = Switch panes. F1 = Help.

Field Name Data Type Description (Optional)

StudentId	Short Text	
StudentName	Short Text	
StudentCity	Short Text	
StudentState	Short Text	
DeptCode	Short Text	
StudentGPA	Number	

Field Properties

General Lookup

Field Size	2
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
Text Align	General

A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

NUM LOCK 12:11 PM 4/23/2015

FILE TOOLS VIEW Donormultiple.docx (Protected View) - Word

PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing

Multiple table (relational) database:

Donor table	Donation table	Drive table
donorid PK	donorid (part 1 of primary key)	driveno PK
dononame	driveno (part 2 of primary key)	drivename
donoradr	datedon (part 3 of primary key)	drivegoal
	amt	

Set up these three tables in Access and populate them. When you populate, be sure that you make the fields that link the same type and size. So donorid should be the same type and size on the donor table and the donation table. Note that the donation table has 3 parts to the primary key – they are: donorid, driveno, datedon.

Look at the queries below when you populate the table so you will have data to test.

Now do these queries using the user interface:

- Use two tables that relate and do a query using two things in an and relationship.
- Use two tables that relate and do a query using two things in an or relationship.
- List the donorid, the dononame, the amt, the driveno, the drivename.
- List the donorid, the dononame, the amt, the driveno, the drivename for all donations where the amt is greater than 100 (you can change this amt if your data does not have many records with amt greater than 100).
- List all of the information where the driveno is equal to a certain number and either the drivegoal is greater than a certain amount or the amt is greater than a certain amount. For example driveno is 123 and either drivegoal is greater than 50000 or amt is greater than 100.

Can be year

End of document

SCREENS 1-2 OF 2

140%