

# FileMaker Pro

## Relational Databases

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## Explanation

Most smaller data documents are called *flat* files. That means that all the information is contained in a single document. The exercises we created and used earlier are examples of flat files. Sometimes, however, a single flat file is not sufficient to handle all the information needed. FileMaker Pro is what is known as a relational database. This is the ability to relate databases so that information can be extracted from several databases into one document.

### TIP:

When you create a set of relational databases, it is important that they remain together in the same folder with the same names as they had when they were created. So before we even get started, create a new folder out on the desktop. Then every time you create a new database, be sure to store it in that folder.

Today's exercise will introduce you to "lookups" and "portals," in addition to relational databases. We are going to start with a school setting. We'll create the following databases:

1. When a student applies for admission, they fill out an application with all their personal information (DB 1).
2. Classes need to be offered (DB 2).
3. Students need to enroll in the classes (DB 3).
4. Class lists needs to be generated so each student knows what days and times to go to class (DB 4).

### Database 1:

When students apply for school, they fill out an application containing the following data, so create the first database with these fields:

SSN	Number
First Name	Text
Last Name	Text
Address	Text
City	Text
State	Text
ZIP	Text

Don't spend any time making this database look lovely because it is only going to contain data. We're not actually going to print from here. Save this document as Student Info.

Database 2:

We need a database which lists all information related to classes offered. This information includes:

Class ID	Text
Teacher	Text
Time	Text
Days	Text
Description	Text

Once again, this information is just going to be used, not printed, so don't bother formatting it lovely. Save this document as Class Info.

Database 3:

When students sign up for classes, that information needs to go into a database. In Database 3 the data entry person only needs to enter each student's ID and the class ID. The rest of the information will be entered automatically (if it is set up correctly). For now, just enter in the fields. We'll set them up in the next step.

SSN	Number
Class ID	Text
Teacher	Text
Time	Text
Days	Text
Description	Text

You may have noticed that most of these fields are the same as Database 2. In fact, the information for most of the fields will be copied into these fields from Database 2 soon. Once again, this information is just going to be used, not printed, so don't bother formatting it lovely. Save this document as Enrollees.

Database 4:

The fourth and last database will pull together all the information we've entered into the previous databases. It will provide the student with a list of his/her classes, along with times and days, teacher information, and a description of each class. Create the following fields. We'll format them shortly.

SSN	Number
First Name	Text
Last Name	Text
Address	Text
City	Text
State	Text
ZIP	Text

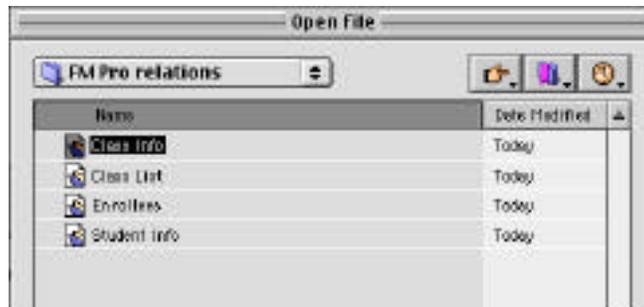
In addition to these fields, we will create a “portal” which will bring in information about each class. Since this information will be printed out, this is the only database we need to format nicely. We’ll do that after we set up the portal. Save this document as Class List

### Setting Up Relationships

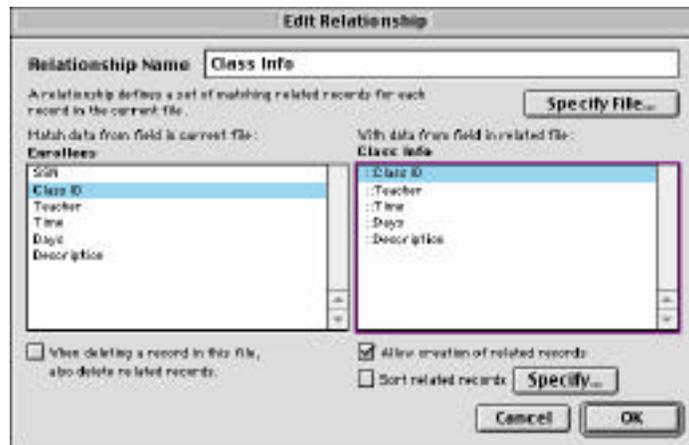
Now comes the fun part. When it comes to entering data into our documents, we will need to put all the data into the first two documents (**Student Info** and **Class Info**) ourselves. After we create relationships between the databases, much of the information common to each will be automatically entered into the last two databases.

To start with, we’ll create the relationship between Class Info and Enrollees. Since we will enter the data into **Class Info** ourselves, we then want data to go from it into **Enrollees**. This makes **Enrollees** the destination file, so start here.

1. From the File Menu, choose Define Relationships...
2. When the Define Relationships box appears, click on the New button at lower left.
3. Identify the document **Class Info** as the file you’re establishing a relationship with.



4. In the resulting Edit Relationship dialog box, create a link between Class ID in the left box and ::Class ID in the right box. What you’re doing here is setting it up so that when the Class ID field in **Enrollees** has the same data in it as the Class ID field in **Class Info**, then a relationship is established. Then click the OK button.



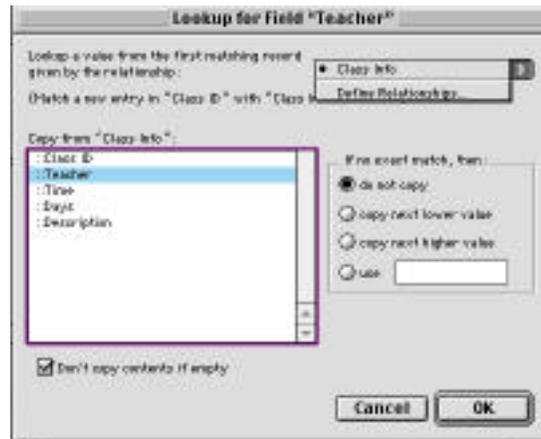
- When the Define Relationships for Enrollees box reappears, click on the Done button.



### Creating Lookups

At this point we want to create some “lookups.” Lookups copy data from one database into another. A lookup can contain only one record from a related file. We are going to set it up so that when both the Class Info document and the Enrollees document have identical information in their Class ID fields, then the data from other fields in the Class Info document gets copied into corresponding fields in the Enrollees document.

- While in the Enrollees document, open Define Fields... from the File menu.
- Click on the Teacher field name, then click on the Options... button (located near the bottom of the window).
- If you're not already on the Auto-Enter tab, click on it to get there. Then near the bottom of the dialog box, click on the Looked-up Value check box. When you do that, another dialog box will appear:





1. **Open up the Student Info document. We'll create records for six students as shown below:**

SSN	First	Last	Address	City	State	ZIP
11111	Mickey	Mouse	55 Disneyland	Anaheim	CA	99944
22222	Minnie	Mouse	54 Disneyland	Anaheim	CA	99944
33333	Barbie	Mattel	32 Toyland	Orange	CA	94949
44444	GI Joe	Mattel	33 Toyland	Orange	CA	94949
55555	Donald	Duck	67 Disneyworld	Miami	FL	00033
66666	Daisy	Duck	68 Disneyworld	Miami	FL	00033

2. **Open up the Class Info document. We'll create records for three classes as shown below:**

Class ID	Teacher	Time	Days	Description
ART 1	Goofy the Dog	9-10 am	MWF	Learn to draw
BIO 2	Bill Nye	10-11 am	TTh	Learn about life
CHEM 3	Julia Childs	2-5 pm	MTF	Learn to cook

(Remember that FileMaker saves automatically so you don't have to.)

3. **Open up the Enrollees document. Create the following records:**

SSN	Class ID
11111	ART 1
22222	ART 1
33333	BIO 2
44444	BIO 2
55555	CHEM 3
66666	Art 1

SSN	Class ID
11111	BIO 2
22222	CHEM 3
33333	CHEM 3
44444	CHEM 3
55555	Art 1
66666	BIO 2

As you enter in this information, you should see the rest of the fields automatically filling in information. If not, then you may have a problem with your Lookups. These three documents are essentially complete.

## Class List Document

Now we have to turn our attention to our Class Lists document. This one we have to relate back to our previous documents so that information is automatically inserted.

1. Open the Class Lists document if it isn't already opened. Choose Define Relationships... from the File menu. Click on the New button at the bottom of the box.
2. Choose the document Student Info to establish a relationship. When the next dialog box appears, link the SSN from Class Lists to the ::SSN field from Student Info. Click in the box labeled "Allow creation of related records" before clicking OK and Done.
3. Now you have to create the Lookups from one file to the next. Open up Define Fields... from the File menu. Click once on the First Name field and click on the Options button.... Proceed to create the lookup relationship as we did in the previous exercise. Create lookups for these fields: First Name, Last Name, Address, City, State, ZIP. Then close the Define Fields... dialog box by clicking on the Done button at the bottom of the window.

## Portals

A portal allows you to show information on the current database that is actually stored in a different database. Portals are different from Lookups in at least two important features:

- (a) Information from a portal actually stays in the original database. That means that if you change any information in one place, it will be reflected in all other databases. A lookup, on the other hand, just copies information from one database into another. If you change data in the new database, it won't be reflected in the old one.
  - (b) Portals can show any number of records from a related file. A lookup can only show one record.
4. Before we can put in the portal, we need to define a relationship between this document, Class List and the Enrollees document. The field that will create the relationship is the SSN field. Create this relationship as you were shown previously.
  5. Switch now to the Layout View from the View menu. Drag down on the body line to make the body a little longer. In the empty white space we will put a portal.
  6. On the toolbar, click on the Portal Tool,
  7. Move your cursor to the white space in the layout and drag a box, taking up most of the width of the page. The Portal Setup box will appear. You need to identify the document connected to this portal, which is Enrollees. Then set the number of rows to show to 3 and click OK.
  8. Now add the fields from the Enrollees document. Just as adding any fields, click on the Field tool and drag over the field to the Portal box. Take care that the entire field is inside the Portal box or not all the fields will show up. In this way, insert the following fields:  
::Class ID, ::Teacher, ::Time, ::Days, ::Description



- Spend some time now making your layout look good. Arrange the upper fields in a nice order. This is what is going to get printed out, so it shouldn't look like a list. This is what my layout looks like:

The screenshot shows a database layout in a window titled "water". The layout is divided into two main sections. The top section is a form for a student record with the following fields: SSN, First Name, Last Name, Address, City, State, and ZIP. The bottom section is a table with the following columns: Class ID, Teacher, Time, Days, and Description. The table has a header row and several rows of data, with the first row containing the column names and the subsequent rows containing placeholder text like "CLASS ID", "TEACHER", "TIME", "DAYS", and "DESCRIPTION".

- Switch now to the Browse mode. In the first record, type 11111 for Mickie Mouse's information. When you hit the Tab key, the entire rest of the database should automatically fill in. Go ahead and create records for the rest of your students.

COOL!, HUH?

- Look carefully at your data. Does all the information fit into the cells, or is something missing. If you need to, return to Layout mode and resize your fields.
- Switch to Preview mode and see how your data will look printed out. If necessary, return to Layout mode and adjust again. Keep at it until you are satisfied with your work.

**Congratulations!**

You have completed a Relational Database  
that can save you lots of time and energy!