Microsoft Visio Professional is a powerful database design and modeling tool. The Visio software has so many features that we can’t possibly demonstrate all of them in this short tutorial. However, we will show you how to:

- Start Visio Professional.
- Select the Crow’s Foot entity relationship diagram (ERD) option.
- Create the entities and define their components.
- Create the relationships between the entities and define the nature of those relationships.
- Edit the Crow’s Foot ERDs.
- Insert text into the design grid and format the text.
Once you have learned how to create a Visio Crow’s Foot ERD, you will be sufficiently familiar with the basic Visio Professional software features to experiment on your own with other modeling and diagramming options. We will also show you how to insert text into the Visio diagram to document features you consider especially important or to simply provide an explanation of some segment of the ERD.
A.1 STARTING VISIO PROFESSIONAL

The typical Visio Professional software installation lets you select Visio through the Start, (All) Programs, Microsoft Visio sequence. After the Visio software has been activated, click the Database option to match the screen shown in Figure A.1. (Previously created Visio files show up in the Open a drawing header on the right side of the screen. For example, our third drawing is stored in a file named Fig8-07-A-Composite-Entity. Naturally, your screen will not yet show any drawings.)

FIGURE A.1  THE VISIO PROFESSIONAL OPENING SCREEN

As you examine Figure A.1, note that we have placed the cursor over the arrow button next to the question mark at the upper-right corner of the screen to show you that you may select various toolbar options. Although you can customize your toolbar through this selection, we will keep the toolbar at its default view to make sure that you will see the standard Visio screens.
With the **Database** selection shown in Figure A.1, move the cursor over the **Database Model Diagram** object. Note that your selection results in a square outline placed around the object. Also note that the cursor changes to a hand with a pointing finger, as shown in Figure A.2. In addition, you will see the Database Modeling Template description in the lower-left corner of your screen.

**FIGURE A.2  THE DATABASE MODEL OBJECT SELECTION**

Click the **Database Model Diagram** selection shown in Figure A.2 to produce the screen shown in Figure A.3. Because we prefer a larger grid than the one shown in Figure A.3, we’ll start by clicking the size selection (zoom) list box located on the button bar at the top of the screen. Click the down arrow to generate the list of size options, shown as percentages. As you can tell in Figure A.3, we have selected the **100%** option. When you click the 100% selection, the grid expands to fill the screen.
By selecting the Visio Professional database option and its drawing board, you have completed the preliminary work required to create ERDs. You are now ready to draw the ERDs on the drawing board. We will use the Crow’s Foot option to show you how all the ERDs in the text were created.

A.2 SETTING THE STAGE FOR CREATING A CROW’S FOOT ERD

To select the Crow’s Foot option, select the Database, Options, Document... sequence shown in Figure A.4. (Note that the drawing grid has expanded in response to the 100% selection shown in Figure A.3.)
When you click the **Document**... option shown in Figure A.4, you will see the **Database Document Options** window in Figure A.5. The default selection is the **General** tab shown in Figure A.5. Note that the default selections in the **General** tab are **Relational** and **Physical names**. We’ll leave the default options shown here. (The black dots inside the white circles, known as radio buttons, indicate that the option was selected.) If your screen does not show these selections, click their radio buttons to place the black dot inside the white circle. To deselect an option, click the radio button again to remove the black dot.
Move the cursor to the **Relationship** tab in Figure A.5 and click to select it to produce the screen shown in Figure A.6. Make sure that there is a check mark in the check box next to the **Crow’s feet** option to indicate that this option was selected. If there is no check mark, click this check box to select this option. (If a check box is “grayed out,” it cannot be changed. For example, at this point the check boxes under the **Show verb phrase** option cannot be changed, because the option has not been selected.)

**FIGURE A.6 THE DATABASE DOCUMENT OPTIONS, RELATIONSHIP TAB**

Examine Figure A.6, and note that we have not (yet) indicated that the relationship name is to be displayed; therefore, nor have we indicated how the names are to be displayed. We will return to this dialog box later to show you the effect of these selections and to demonstrate that you can edit the displays when you are working on them.

Next, select the **Table** tab in the Database Document Options dialog box, as shown in Figure A.7. Make sure that the check boxes are marked as shown here.
Click the **OK** button shown in Figure A.7 to begin creating Crow’s Foot ERDs.

### A.2.1 The Business Rules

To illustrate the development of the Visio Professional’s Crow’s ERD, we will create a simple design based on the following business rules:

1. A course can generate many classes.
2. Each class is generated by a course.
3. A course may or may not generate a class.

Note that we have defined a class as a section of a course. This reflects the real world’s use of the labels *class* and *course*. Students have a class schedule, rather than a section schedule. The catalog that lists all the courses offered by a department is called a *course* catalog. Some courses are not taught each semester, so they may not generate a class during any given semester. In fact, some courses may be taught only when there is sufficient student demand.
A.3 Creating an Entity

Now that you have some idea of the proposed design components, let’s create the first entity for the design. Click the Entity object shown in Figure A.8. (Note that we have circled it.) Drag the Entity object to the grid and then drop it. This action will produce the Table1 object shown in the grid in Figure A.8. (The “1” in the Table1 label indicates that this is the first entity object to be placed on the grid.) Note that the entity object is shown as a table. That’s because the entity object is represented by a conceptual table.

**Figure A.8 Placing the Entity Object in the Grid**

![Diagram of entity object placement](image)

As you examine Figure A.8, note that the small “locks” around the Table1 object perimeter indicate that Table1 object has been selected. You can deselect the object by clicking an empty portion of the grid. If the Table1 object has not been selected, click it to select it.
A.3.1 The Database Properties Window

If the Table1 object has been selected as shown in Figure A.8, you will see the default Database Properties window at the bottom of the screen. (We will show you later in this section that this window’s location and format may be changed to become the new default. However, we will start by using the standard default window shown in Figure A.8.)

As you examine the Database Properties window in Figure A.8, note the selection of the Definition option in the Categories: listing. (To select any option in the list, click it. The selection is indicated by the arrow to the left of the option. In this case, the arrow appears next to the Definition option.) At this point, the default Table1 label shows up in the Physical name: slot.

A.3.2 Creating the Default Database Properties Window

Depending on how you configured the Visio Professional software and/or on what operating system you use, you may not see the Database Properties window shown in Figure A.8. If your screen does not show a default Database Properties window, right-click the Table1 object in the grid to generate the Database Properties… option shown in Figure A.9.

FIGURE A.9 Selecting the Database Properties Option

Click the Database Properties… option shown in Figure A.9, and a Database Properties window appears somewhere on the screen. Figure A.10 shows you a typical result. In this example, the Database Properties window is located on the grid, next to the Table1 object. We will show you how to change the window’s location and format.
A.3.3 Sizing the Database Properties Window

You can size the **Database Properties** window as you would size any Windows object. For example, note that we have placed the cursor on the right margin (see Figure A.11) to change the cursor shape to a double-sided arrow in preparation for widening the window by dragging its right limit.

**FIGURE A.11 SIZING THE DATABASE PROPERTIES WINDOW**
A.3.4 Moving the Database Properties Window

You can also drag and drop the entire Database Properties window to the screen’s lower-left corner (see Figure A.12).

FIGURE A.12 The Database Properties Window in the Lower-Left Corner

Naturally, you can also drag and drop the Database Properties window back to its original position depicted in Figure A.8. (Just drag and drop to the screen’s bottom margin.) Because that location allows us to see more of the database properties without blocking part of the entities we draw on the screen, that’s the position we’ll use.

A.3.5 Creating the Entity Name

We will first create a COURSE entity, so place the cursor in the Physical name: slot and type COURSE as shown in Figure A.13. Because the Sync names when typing (default) option was selected in Figure A.13, the Physical name: and Conceptual name: entries are the same.
When you have finished typing the **COURSE** label in the **Physical name** slot as shown in Figure A.13, note that the conceptual table in the grid automatically inherits the COURSE label. You are now ready to start defining the table columns.
A.3.6 Defining the Entity Attributes (Columns)

Each table column represents one of the characteristics (attributes or fields) of the entity. For example, if the COURSE entity, represented by the COURSE table, is described by the course code, the course description, and the course credits, you can expect to define three columns in the COURSE table. Table A.1 gives you a preview of the expected COURSE table structure. (We have also entered a few sample records to give you an idea of the COURSE table contents.)

<table>
<thead>
<tr>
<th>CRS_CODE</th>
<th>CRS_TITLE</th>
<th>CRS_DESCRIPTION</th>
<th>CRS_CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT-345</td>
<td>Managerial Accounting</td>
<td>Accounting as a management tool. Prerequisites: Junior standing and ACCT 234 and 245.</td>
<td>3</td>
</tr>
<tr>
<td>CIS-456</td>
<td>Database Systems Design</td>
<td>Creation of conceptual models, logical models, and design implementation. Includes basic database applications development and the role of the database administrator. Prerequisites: Senior standing and at least 12 credit hours in computer information systems, including CIS-234 and CIS-345.</td>
<td>4</td>
</tr>
<tr>
<td>ECON-101</td>
<td>Introduction to Economics</td>
<td>An introduction to economic history and basic economic principles. Not available for credit to economics and finance majors.</td>
<td>3</td>
</tr>
</tbody>
</table>

To define the columns of the COURSE table, you must assign column names and characteristics. The first column in the COURSE table will be the CRS_CODE, which serves as the table’s primary key (PK). Because typical course code entries might be values such as CIS-456 or ACCT-234, each data entry involves a character string. In structured query language (SQL) terms, the CRS_CODE data are best defined as CHAR() data. Figure A.14 shows you how the CRS_CODE name and data characteristics were specified.
FIGURE A.14  THE COLUMN PK SELECTION

To generate the appropriate input for the column characteristics shown in Figure A.14, follow these steps:

1. Make sure that the COURSE table object—shown in the grid—is selected. (The handles around the perimeter show that the selection was properly made.)

2. Select the Columns option in the Database Properties window at the bottom of the screen. (Note that the selection was marked with an arrow.)

3. Step 2 generates the column-specific dialog box. Type CRS_CODE in the first line under the Physical Name header. Moving along the line for the CRS_CODE entry:
   a. Select the Char option from the drop-down list under the Data Type header. (Click the down arrow to generate the list.)
   b. Because a course code is required to define the course offering, place a check mark—by clicking the check box—under the Req’d header.
   c. Because the CRS_CODE is the PK, place a check mark—by clicking the check box—under the PK header.
When you have completed these steps, you will see the screen depicted in Figure A.14. Before we enter the remaining attribute names and characteristics, let’s first enlarge the **Database Properties** window by dragging its upper limit (see Figure A.15) to increase the desired space. This action will let us see all of the remaining attributes in the COURSE table. Now place the cursor on the second **Columns** line and get ready to enter the remaining attributes.

**FIGURE A.15  DRAG THE DATABASE PROPERTIES BOX LIMIT TO SHOW MORE COLUMNS**
We are now ready to make the entries for the second COURSE attribute. Name this attribute CRS_TITLE. Typical entries are Database Design and Implementation or Intermediate Accounting. (Check the sample entries in Table A.1.) Therefore, the CRS_TITLE is a character field. Similarly, enter the CRS_DESCRIPTION entries. The course description is required, but it is not a PK. The CRS_CREDITS entries are numeric and they are required; they will be used at some point to help compute grade point averages for the students taking a section of this course. When the appropriate entries are made, the screen will look like Figure A.16. (Only a portion of the screen is shown to save space.) Note that the attribute names become boldfaced when the Req’d (required) option is checked for the Column property.) Selecting this option means that the end user will be required to make a value entry for the checked attribute—after the design has been implemented—when the table is opened for data entry.

**FIGURE A.16 ENTER THE REMAINING COLUMNS**

![Diagram showing the remaining columns](image)

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**A.4 SAVING AND OPENING THE VISIO ERD**

Because we don’t want to lose this first Visio Professional ERD segment, let’s save it in an appropriate folder. Use the File, Save As option to select the folder location and the filename, as shown in Figures A.17 and A.18.

**FIGURE A.17 SELECT THE SAVE AS OPTION TO SAVE THE FILE**

![File Save As option](image)
As you examine Figure A.18, note that the filename describes its origin and purpose. In this example, the ERD was named Tiny-College-COURSE-and-CLASS-segment. The naming convention we have adopted serves the important purpose of self-documentation. Note also that the file is saved as a Visio Drawing.

If you want to see additional details about the file, go to the desktop, select the folder in which you have saved the file, right-click the filename, and select the Properties option to see the results in Figure A.19. (Note that we have selected the General tab and that the file was saved as an Archive type. If you place a check mark in the Read only option, the file cannot be modified until you remove the Read-only option by clicking it to remove the check mark.)

**FIGURE A.18** SELECT THE FOLDER, TYPE THE FILENAME, AND SPECIFY THE FILE TYPE

**FIGURE A.19** DESCRIBE THE FILE PROPERTIES
We can now go ahead and close the file—and, of course, make a backup copy! The next time we want to use
the file, after we start Visio Professional, we use the standard Windows **File, Open** option to retrieve and open
the file. In fact, that's how we generated the screen shown in Figure A.20.

**FIGURE A.20 OPEN THE PREVIOUSLY SAVED FILE**

Note that the just-opened file shown in Figure A.20 does not show any entity properties. If you want to see this
entity's properties, right-click the **COURSE** table and select **Database Properties** to display its **Database
Properties** window again.

You are now ready to define the **CLASS** entity, using the same techniques we used to create the **COURSE**
entity. When you are done, the screen will look like Figure A.21.

**FIGURE A.21 ADDING THE CLASS ENTITY**
A.5 DEFINING RELATIONSHIPS

As you examine Figure A.21, note that we have not defined a foreign key (FK) in CLASS to relate CLASS to COURSE. Instead, we will let Visio Professional define the FK field when we specify the relationship between these two entities. Do not enter your own FK fields! (Visio Professional tells you what the relationship option will do for you—read the relationship text in Figure A.22).

FIGURE A.22 SELECT THE RELATIONSHIP OBJECT

To create a relationship between the entities, first click the Relationship object shown in Figure A.22, drag it to the grid, and then drop it between the COURSE and CLASS entities to produce the results shown in Figure A.23.

FIGURE A.23 DRAG AND DROP THE RELATIONSHIP OBJECT

As you examine Figure A.23, note that dropping the Relationship object on the grid produces the relationship line. Further note that the symbols at the two ends of the relationship line reflect default cardinalities of (1,1) and (0,N). Finally, remember that the relationship to be established between COURSE and CLASS reflects the business rule “One COURSE may generate many CLASSes.” Therefore, the COURSE represents the “one” side of the relationship and the CLASS represents the “many” side of the relationship.

Attach the “1” side of the relationship line to the COURSE entity by dragging the “1” end of the relationship line to the COURSE entity, as shown in Figure A.24. Note—and this is very important—that the relationship is not attached until the COURSE table is outlined in red. (You may have to drag the relationship line’s end all the way to the inside of the table before the red outline shows up.) When you release the relationship line, its attachment is verified by the red square on the entity (table) perimeter.
FIGURE A.24 ATTACH THE “1” SIDE OF THE RELATIONSHIP LINE

Using the same technique that was used to attach the “1” side of the relationship, drag the “M” side of the relationship line to the CLASS entity to produce Figure A.25. (Make sure that you see the red square on the CLASS entity side of the relationship line when you are done.)

FIGURE A.25 ATTACH THE “M” SIDE OF THE RELATIONSHIP
As you examine Figure A.25, note these features:

1. The two red rectangles at the margin of each table indicate that the relationship was successfully established and that is still selected. (If the relationship line is no longer selected, the red squares disappear. To reselect the relationship line, click it.)

2. Visio Professional created the CRS_CODE foreign key in the CLASS table, labeling it FK1 to indicate that this is the first FK created for this table. Note that CRS_CODE in the CLASS table is not in boldface type. This lack of boldface indicates that, at this point, you have not yet specified that a FK value is mandatory. (Of course it should be, because a CLASS cannot exist without a COURSE. We will edit this FK property later.)

3. The cardinality next to COURSE was automatically changed to indicate an optional (0,1) relationship between CLASS and COURSE. Because each class must be related to one course, a depiction of a (1,1) cardinality is appropriate. (A CLASS cannot exist without a COURSE.) Therefore, we’ll have to edit this cardinality later.

4. The Database Properties window shows that the (default) Definition option is selected. (Look under the Categories: header.)

5. The relationship is reflected in the double-sided arrow linking the COURSE table’s CRS_CODE and the CLASS table’s CRS_CODE.

### A.5.1 Editing the Cardinalities

If you examine Figure A.25 carefully, you’ll notice that the CRS_CODE in the CLASS entity is not in boldface type. This lack of boldface indicates that the CRS_CODE in CLASS may be null, thus (incorrectly) indicating that COURSE is optional to CLASS. To change the (0,1) cardinality in Figure A.25 to a (1,1) cardinality:

1. Select the CLASS entity.

2. Check the CRS_CODE and note that its Req’d check box is not checked. (This means that a value entry is not required, thus allowing nulls—and making the relationship between CLASS and COURSE optional.)

3. Click the CLASS entity’s CRS_CODE Req’d check box to place a check mark in it. (This means that a value entry will be required, thus making the relationship between CLASS and COURSE mandatory.)

When you have completed these three steps, you will see the results in Figure A.26. Note that the CRS_CODE in the CLASS entity is now in boldface to indicate the mandatory relationship between CLASS and COURSE. This mandatory relationship is reflected by the change in the (0,1) cardinality to a (1,1) cardinality on the COURSE entity.
You can edit the “M” side of the 1:M relationship by selecting the relationship line and the Miscellaneous option in the Categories: list. Then select the Zero or more cardinality (if it is not already selected). Figure A.27 shows a portion of the screen after the selections have been properly made.
A.5.2 Selecting the Relationship Type

As you examine Figure A.27, note the many options you have available. In this case, the relationship type is properly defined to be **Non-identifying**, because the dependent CLASS entity did not inherit its PK from the parent COURSE entity. (When we created the CLASS entity, we defined its PK to be CLASS_CODE, which is not found in the COURSE entity. In other words, the ERD in Figure A.27 indicates that the CLASS entity is not a weak entity. A weak entity always has a strong relationship—that is, an identifying relationship—with its parent entity.)

**NOTE**

The nature of the relationships between entities, the effect of optionalities, and the existence of weak entities all have critical effects on the database design. If necessary, review Chapter 4, “Entity Relationship Modeling,” Section 4.1.5, Relationship Strength, Section 4.1.6, Relationship Participation, and Section 4.1.7, Relationship Strength and Weak Entities, to review the nature and implementation of relationships.

Figure A.27 shows the relationship between COURSE and CLASS as a dashed line. A dashed relationship line between two entities always indicates a non-identifying (weak) relationship between those entities. If you have reviewed the material mentioned in the above note, you know that a weak (non-identifying) relationship always indicates the existence of a strong dependent entity. Conversely, a strong (identifying) relationship always indicates the existence of a weak dependent entity.

If you select an **identifying** relationship between COURSE and CLASS, Visio Professional will automatically rewrite the PK of the CLASS entity for you and the relationship line will be solid. Figure A.28 shows the effect of the relationship revision. After you have examined the effect of the identifying relationship selection, reset the relationship type to the one shown in Figure A.27. (If you want to preserve the identifying relationship version of the ERD, save it with a different name, such as Tiny-College-COURSE-and-CLASS-segment-Identifying-Relationship.)

**FIGURE A.28** Illustration of an Identifying (Strong) Relationship
A.5.3 Naming the Relationships

Make sure that the relationship line is still selected, and then click the Name option in the Database Properties window—look under the Categories: header—to produce the results displayed in Figure A.29. (Note that we have used the original ERD to use the preferred non-identifying relationship between COURSE and CLASS.)

**FIGURE A.29  THE DEFAULT RELATIONSHIP NAME**

As you examine Figure A.29, note that the default Verb phrase: selection is has and that the default Inverse phrase: selection is is of. It’s useful to remember that:

1. All relationships are defined both ways—from the “1” to the “M” side and from the “M” to the “1” side.
2. Active verbs are used to label relationships from the “1” to the “M” side. Passive verbs are used to label relationships from the “M” to the “1” side.
3. Relationship names are written in lowercase.

Using the Name selection in Figure A.29, type the Verb phrase: and Inverse phrase: entries as shown in Figure A.30. Note that we have selected active and passive verbs to describe the relationship between COURSE and CLASS both ways:

1. COURSE generates CLASS.
2. CLASS is generated by COURSE.

Also note that we have dragged the ERD to the bottom of the screen to save some space in Figure A.30 and still show you how all the components are relevant to the discussion.
A.5.4 Showing the Relationship Names

As you examine Figure A.30, you may note that the relationship names are not shown. If you do want those relationship names shown, click the Database option shown at the top of the screen, and then select the Options, Document… sequence you first saw in Figure A.4.

Next, select the database document options Relationship tab (see Figure A.31), click the radio button in front of the Show verb phrase option, and then select the Forward text option. (If you select both the Forward text and the Inverse text options, Visio Professional writes the two relationship names on the same line and separates them with a slash. That option takes more space, so you may have to move the tables farther apart to make the relationship names readable.) Finally, select the Defaults option as shown in Figure A.31 and set the selection as the default. (Note that we have moved the Database Document Options window to show you all the components of this illustration.)
Click **OK** to save the new relationships default shown in Figure A.31 to see all the relationship names in Figure A.32.
As you can tell by looking at the relationship name in Figure A.32, the relationship name is written through the relationship line, thus making it difficult to read. You can change the placement of the relationship name through font control. For example, if you want to place the relationship name above the relationship line, use the **Format…, Text…** selection shown in Figure A.33. (Make sure that the relationship line is still selected because you’re working on a naming format for the relationship line.)

**NOTE**

You may want to save different versions of the ERD to experiment with the various options later. For example, you might want to save this latest modification as *Tiny-College-COURSE-and-CLASS-Segment-Named-Relationship*.

**FIGURE A.33 SELECTING THE RELATIONSHIP NAME TEXT FORMAT**

When you click the **Text…** selection shown in Figure A.33, you will see the window in Figure A.34. Note that we have selected the **Position:** to be **Superscript** and the font **Size:** to be **14 pt.**
After you have made the selections shown in Figure A.34, click the **Apply** button and then click **OK** to accept the font changes. The relationship name will appear above the relationship line as shown in Figure A.35. (We have deselected the relationship line by clicking an empty portion of the grid to make it easier to read the repositioned relationship name.)
A.6 REFERENTIAL ACTION

Make sure that the relationship line is still selected, and then click the Referential Action option in the Database Properties window—look under the Categories: header—to produce the results displayed in Figure A.36.

FIGURE A.36 THE DEFAULT REFERENTIAL ACTION

As you examine Figure A.36, it is important to think of the consequences of a deletion in the parent (COURSE) table. For example, if a COURSE is deleted, do you want to delete all of the classes that are associated with that course? That is, do you want to Cascade the deletion? (To modify any action, simply click the radio button in front of that action.)

The Referential action selection forces you to make sure that the database design is appropriate to the data environment and that you really do understand the ramification of any database action. Given the many action options shown in Figure A.36, you may want to create a small database and try each action to see its effect.
A.7 CONTROLLING THE ERD’S PRESENTATION FORMAT

If you want to modify the ERD presentation format, Visio Professional gives you many options. For example, if you want to color the relationship lines brown, select the relationship line, and then select the Format, Line option shown in Figure A.37. (You can also just right-click the relationship line, and then select the Format, Line option.)

**FIGURE A.37  SELECTING THE FORMAT OPTION FOR THE RELATIONSHIP LINE**

When you select the Line option shown in Figure A.37, you will see the options in Figure A.38. Each selection option has its own drop-down list from which you can make a selection. Note that we have selected the color to be brown and the line weight to be 9. We have left the remaining options in their default settings. Click the Apply button, and then click OK to accept the format changes shown in Figure A.38. (The formatting changes will take effect as soon as you click the Apply button.)
You can format the relationship name’s text, too. To do that, select the **Format, Text:** option shown in Figure A.37 to generate the window displayed in Figure A.39. Note the selection of the brown text color to match the color of the relationship line. The font **Size:** (14) and **Position:** (Superscript) reflect the choices we made earlier in Figure A.34. Note (again) that you must click the **Apply** button, and then click **OK** to accept the format changes.
The results of the relationship line and text formatting are shown in Figure A.40.

Naturally, you can also control the table’s presentation format. To illustrate that process, let’s make the table borders blue. To do that, first select the table you want to format, and then select the format option (Format, Line…) shown in Figure A.37 to generate the line options shown in Figure A.41.
As you examine Figure A.41, note that we selected the line **Color**: to be 4:, which is blue. The selected line **Weight**: is 5:. (The higher the line weight value, the thicker the line.) Remember to first click the **Apply** button, and then click the **OK** button to save the changes. Now repeat the process for the CLASS table to produce the results shown in Figure A.42.
A.8 PLACING TEXT ON THE GRID

To help document the ERD, it may be helpful to place explanatory notes on the grid. To produce such notes, select the **Text tool** (marked A) shown at the top of the screen. Make sure you have deselected the CLASS table by clicking a blank area of the screen. You will see the effect of your selection when you note the cursor’s new look. Select the text format to suit your needs—we have selected left justification and a font size of 12. (See Figure A.43.)

FIGURE A.43 SELECTING THE TEXT TOOL

After making the selections shown in Figure A.43, we typed the text shown in Figure A.44. (You can modify any text format such as the font, size, color, and justification later.)

FIGURE A.44 THE INITIAL TEXT

As you examine the text in Figure A.44, you’ll notice that we lack the space to continue typing the business rules. To make more space, drag and drop the ERD components farther down the screen. (Hold down the **Shift** key as you click each of the two entity boxes and the relationship line to select them all, then you can move them down together.)
To move the text box, you must first make sure that the text tool has been deselected. If the text tool is still active, click it to deselect it. (You will know that the text tool is active when the cursor looks like the one shown in Figure A.43.) You need to remember two important rules that govern the use of the text box:

1. You cannot move the text box unless the text tool is inactive.
2. You cannot edit the text unless the text tool is active. (In other words, the text tool must be selected before you can create or edit text.)

If the text tool is not active, clicking the text box produces a set of small squares (handles) shown on the text box perimeter. You can see the handles around the text box in Figure A.45, which also shows that we have dragged and dropped the ERD farther down the screen. Also note that the four-sided arrow by the cursor indicates that the text box may be moved by dragging and dropping. (If you don’t see the four-sided arrow on your screen, move the cursor until the four-sided arrow appears.)

**FIGURE A.45  SELECTING THE TEXT BOX TO MOVE IT**

After the text box has been selected as shown in Figure A.45, you can drag and drop it as you would any other object on the screen. In fact, the text box behaves like any other Windows object. For example, you can change the size of the text box by dragging its perimeter to move it in or out. Just place the cursor anywhere along the text box perimeter to produce the two-sided arrow shown in Figure A.46.
You can now finish typing the text and you can format it to suit your needs. Our final text box is shown in Figure A.47. Note that we have selected a light blue text color.

Don’t forget to save your Visio file before you exit. As with all Windows applications, you will be reminded to save the file if you try to close it without first saving it.