table is related to one and only one record in
the source table.

**Ordinal data**: Data that are ranked, such as large,
medium, and small cities.

**Ratio data**: Data with known intervals between
values and are based on a meaningful zero
value, such as population densities.

**Record**: A row in a table that represents a map
feature. Also called row or tuple.

**Relational database**: A database that consists of
a collection of tables and uses keys to connect
the tables.

---

**APPLICATIONS: ATTRIBUTE DATA ENTRY AND MANAGEMENT**

This applications section starts with a simple
method for attribute data entry in Task 1. Tasks 2
and 3 cover linking tables and joining tables re-
spectively. Tasks 4 and 5 show how new attributes
can be created through data classification and data
computation respectively. All five tasks use
ArcView. Although both packages have similar
functionalities for attribute data entry and manage-
ment, ArcView is more user-friendly and flexible
than ARC/INFO.

**Task 1: Enter attribute data in ArcView**

**What you need**: landat.shp, a feature theme with
19 records.

For Task 1, you will add a new field to a table
and enter the field values. Because it works with
one field and one record at a time, this data entry
method is good for updating rather than entering a
large amount of data.

1. Start ArcView, open a new view, and add
landat.shp to view. Select Table from the
Theme menu to open the landat.shp theme
table.
2. First you need to add a field to the theme
table before you can enter the field values.
Select Starting Editing from the Table menu.
Notice that the field names in the theme table
come non-italic signaling editing is
enabled. To add a field, select Add Field from

**Soil Survey Geographic (SSURGO) database**:
A database maintained by the Natural Re-
sources Conservation Service (NRCS), for-
merly the Soil Conservation Service, which
archives soil survey data in 7.5-minute quad-
rangle units.

**Source table**: The table to assign data from.

---
Task 2: Link tables in ArcView

What you need: \textit{wp.shp}, a forest stand theme; \textit{wpdata.dbf} and \textit{wpact.dbf}, two attribute data files that can be linked to \textit{wp.shp}. \textit{Wpdata.dbf} includes vegetation and land type data, and \textit{wpact.dbf} includes activity records.

ArcView offers \textbf{LINK} and \textbf{JOIN} for attribute data management. Task 2 uses \textbf{LINK} to link a feature theme table to two separate dBASE files. The data files are part of a relational database.

1. Start ArcView, open a new view, and add \textit{wp.shp} to view. Select Table from the Theme menu to open the \textit{wp.shp} theme table.

2. Make the Project window active. Click Tables and Add to open the Add Table dialog. Make sure that the File Type is \textbf{dBASE} in the dialog. Click on \textit{wpdata.dbf} and \textit{wpact.dbf} to add them as new tables.

3. Arrange the three tables of attributes of \textit{wp.shp}, \textit{wpdata.dbf}, and \textit{wpact.dbf} so that they are all visible on the monitor. \textit{Wpdata.dbf} and \textit{wpact.dbf} are dBASE files containing additional attributes of \textit{wp.shp}. What you want to do next is to link \textit{wpdata.dbf} and \textit{wpact.dbf} to the \textit{wp.shp} theme table. In linking, \textit{wpdata.dbf} and \textit{wpact.dbf} are called the source tables and the \textit{wp.shp} theme table is called the destination table.

4. First, link \textit{wpdata.dbf} to the \textit{wp.shp} theme table by using the field of \textbf{Id} in both tables as the relate item. Click on \textbf{Id} in \textit{wpdata.dbf} and \textbf{Id} in the \textit{wp.shp} theme table. Then select Link from the Table menu. Repeat the same procedure to link \textit{wpact.dbf} to the \textit{wp.shp} theme table.

5. Click a record in the \textit{wp.shp} theme table. The record is highlighted, so are its related records in \textit{wpdata.dbf} and \textit{wpact.dbf} and the selected map feature in \textit{wp.shp}.

Task 3: Join tables in ArcView

What you need: \textit{wp.shp} and \textit{wpdata.dbf}, same as Task 2.

Task 3 asks you to join a dBASE file to a feature theme table. The choice between \textbf{JOIN} and \textbf{LINK} in ArcView depends on the task. \textbf{JOIN} combines attribute data from different tables into a single table, making it possible to use all attribute data in query, classification, or computation. Tables that are linked remain separate, thus limiting attribute data manipulation to individual tables.

1. Start ArcView, open a new view, and add \textit{wp.shp} to View. Select Table from the Theme menu to open the \textit{wp.shp} theme table.

2. Make the Project window active. Click Tables and Add to open the Add Table dialog. Click on \textit{wpdata.dbf} to add the table.

3. At this point, you have opened two tables: the theme table (Attributes of \textit{wp.shp}) and \textit{wpdata.dbf}. Next, you want to join the data from \textit{wpdata.dbf}, the source table, to the theme table, the destination table, by using \textbf{Id} in both tables as the key.

4. Click on the \textbf{Id} field in \textit{wpdata.dbf} to make it active. Click on \textbf{Id} in the theme table to make it active.

5. Click the Join button to join \textit{wpdata.dbf} to the \textit{wp.shp} theme table.

Task 4: Attribute Data Classification in ArcView

What you need: \textit{wp.shp} and \textit{wpdata.dbf}, same as Task 3.

You have joined a dBASE file to the \textit{wp.shp} theme table in Task 3. Task 4 demonstrates how this expanded theme table and its attribute data can be used for data classification and creation of a new attribute.

1. Make sure that \textit{wp.shp} is still in view, and attribute data from \textit{wpdata.dbf} are still joined to the \textit{wp.shp} theme table.
2. You want to classify values of the field Elev into 4 classes. Elev represents average elevation in a vegetation stand and is measured in hundreds of feet. Elev in wp.shp ranges from 24 to 52. One record has an Elev value of 0, because the polygon is not under the jurisdiction of the national forest. The four classes of Elev are <= 40, 41-45, 46-50, and > 50.

3. First, you need to add a new field, called Elevzone, to save the results of classification. Follow the same procedure as in Task 1: select Starting Editing from the Table menu, select Add Field from the Edit menu, and define the new field as having the name of Elevzone, Type of Number, Width of 2, and Decimal Places of 0.

4. Click the Query Builder button to open the Query Builder Box. Prepare the logical expression as: ([Elev] > 0) and ([Elev] < = 40). Click on New Set in the dialog. Those records that meet the logical expressions are now highlighted in the wp.shp theme table. Click the Promote button so that the highlighted records are at the top of the table. Close the Query Builder dialog.

5. Select Calculate from the Field menu to open the Field Calculator dialog. The lower left corner of the dialog is the display area for the computation expression. Notice that the field, Elevzone, is shown above the display area with the equal sign. Enter 1 in the display area and click OK. Now the highlighted records in the table all have the value of 1 under Elevzone, or are classified into Elevzone 1.

6. Click the Query Builder button again and prepare the logical expressions as: ([Elev] > 40) and ([Elev] < = 45). Click on New Set in the dialog. Open the Field Calculator dialog, and enter 2 in the display area. Now the classification of Elevzone 2 is done.

7. Repeat the same procedure to complete the classification of Elevzone 3 and 4. To save results of the classification, select Stop Editing from the Table menu and answer Yes to save edits.

Task 5: Attribute Data Computation

What you need: wp.shp and wpdata.dbf, same as Task 3.

You have created a new field from data classification in Task 4. Another common method for creating new fields is computation. Task 5 shows how a new field can be created and computed from existing attribute data.

1. If wp.shp is still in view, make it active; otherwise, add wp.shp to view and make it active. Open its theme table.

2. The field area in the wp.shp theme table is measured in square nieters. You want to convert the area measurement to acres in this task. Select Start Editing from the Table menu. Notice that the field names in the theme table become non-italic when editing is enabled. Select Add Field from the Edit menu. In the Field Definition dialog, change the name to acres, select Number as the type, change the width to 8, and change the decimal places to 2. After you click OK and dismiss the dialog, the new field, acres, is added to the wp.shp theme table.

3. Select Calculate from the Field menu to open the Field Calculator dialog. The lower left corner of the dialog is the display area for the computation expression. Notice that the field, acres, is shown above the display area with the equal sign. Double click the field area, double click the / request, type 1000000, double click the * request, and then type 247.11. The completed calculation expression should read: [Area] / 1000000 * 247.11. Click OK in the Field Calculator dialog and dismiss it. The acres field is now populated with the calculated values in acres.

4. To save results of the calculation, select Stop Editing from the Table menu and answer Yes to save edits.