Delphi advanced programming technology

Chapter 1

INTRODUCING DELPHI

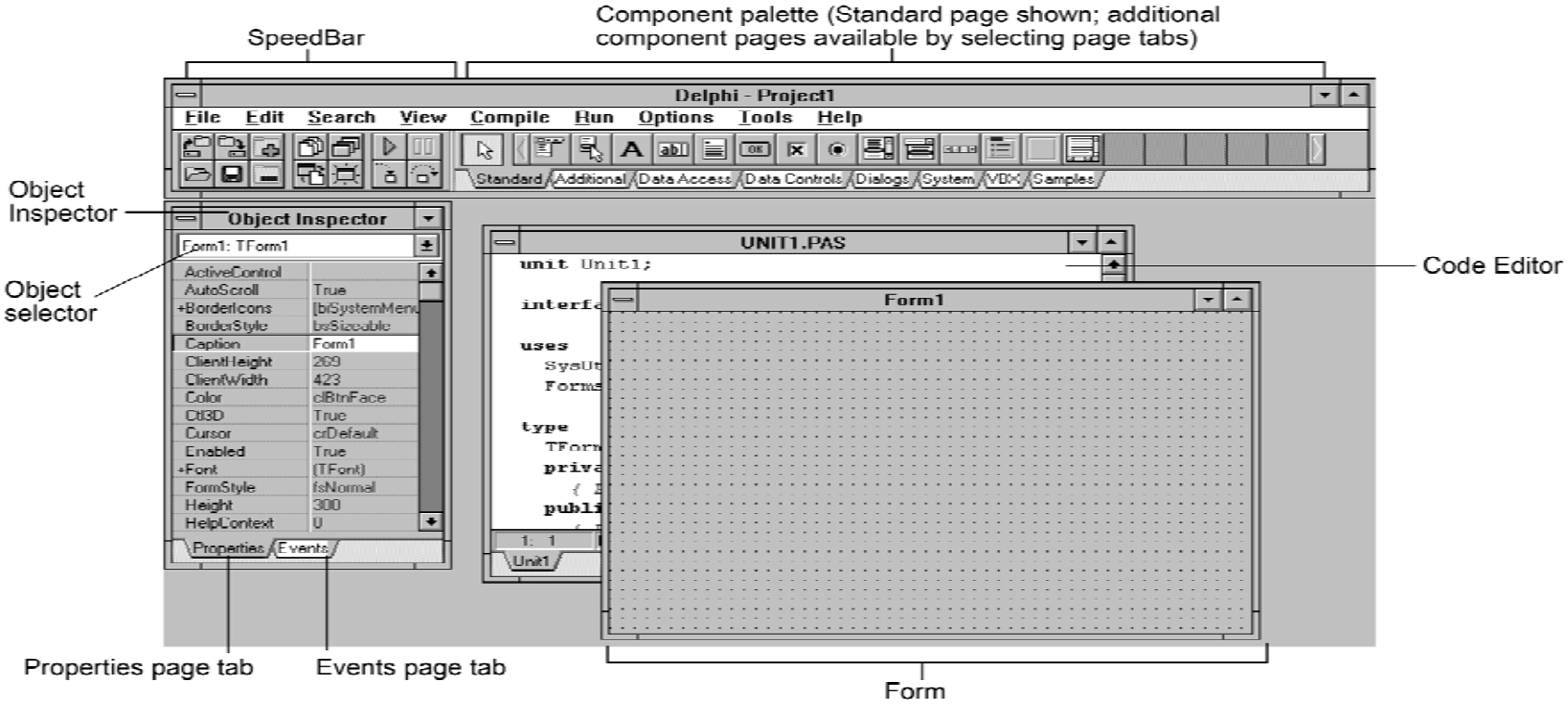
Professor Zhaoyun Sun

Outline

- The Delphi programming environment
- Elements of the Delphi interface
- The Delphi development model
- Overview of Delphi projects
- Setting environment preferences

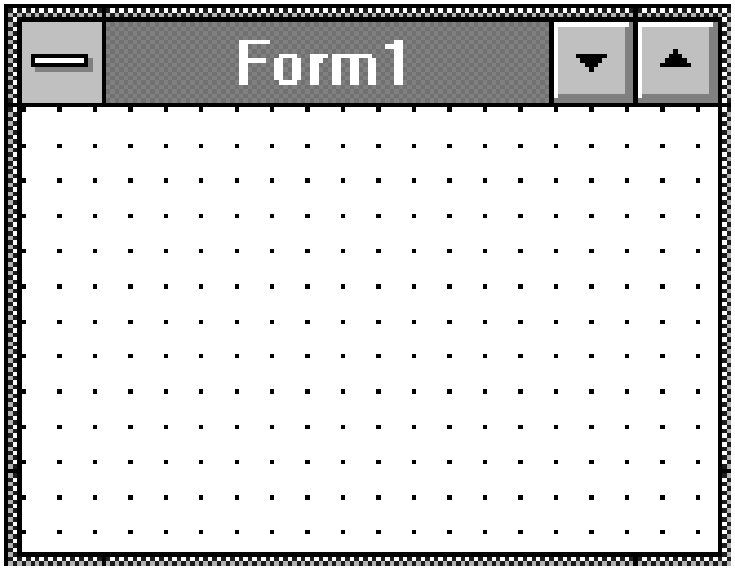
1.1 The Delphi Programming Environment

☐ Starting Delphi



The Delphi programming environment

1.2 Elements of the Delphi interface



Form

☐ Forms

■Forms are the focal point of nearly every application you develop in Delphi. You use the form like a canvas, placing and arranging components on it to design the parts of your user interface.

■Components are the building blocks of Delphi applications.
They appear on the Component palette, displayed in the top right-hand part of the screen.

Elements visible upon starting Delphi

- Forms

  - You can think of a form as a component that can contain other components. Your application's main form and its components interact with other forms and their components to create your application interface.

  - The main form is your application's main interface; other forms can include dialog boxes, data entry screens, and so on.

Elements visible upon starting Delphi

- Forms

  - You can resize the form and move it anywhere on your screen. A form includes standard features such as

    - Control menu
    - Minimize and maximize buttons
    - Title bar
    - Resizeable borders

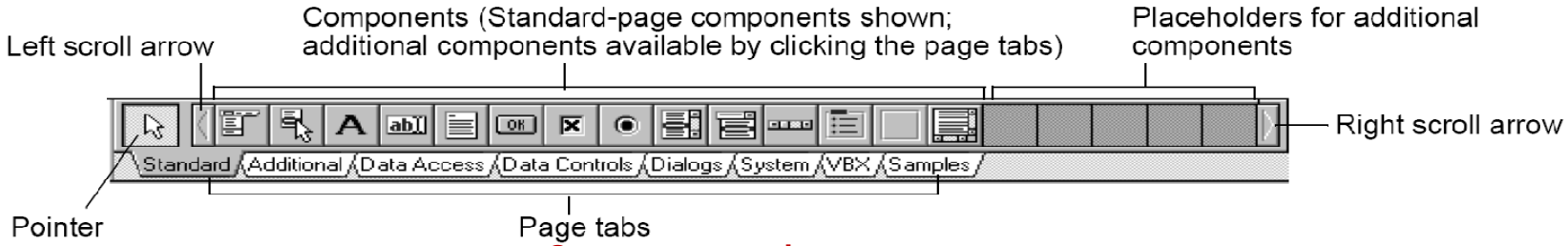
Elements visible upon starting Delphi

- You can change these features, as well as other properties of the form by using the Object Inspector to edit the form during design time—the time during which you are designing, rather than running, your form.

- Properties define a component's appearance and behavior.

Elements visible upon starting Delphi

☐ Component palette



Component palette

■ **Components are the elements you use to build your Delphi applications. They include all the visible parts of an application, such as dialog boxes and buttons, as well as those that aren't visible while the application is running, such as system timers or Dynamic Data Exchange (DDE) servers.**

Elements visible upon starting Delphi

■You can create your own custom components and install them onto the Component palette, making the Delphi environment fully extensible

□ Object Inspector

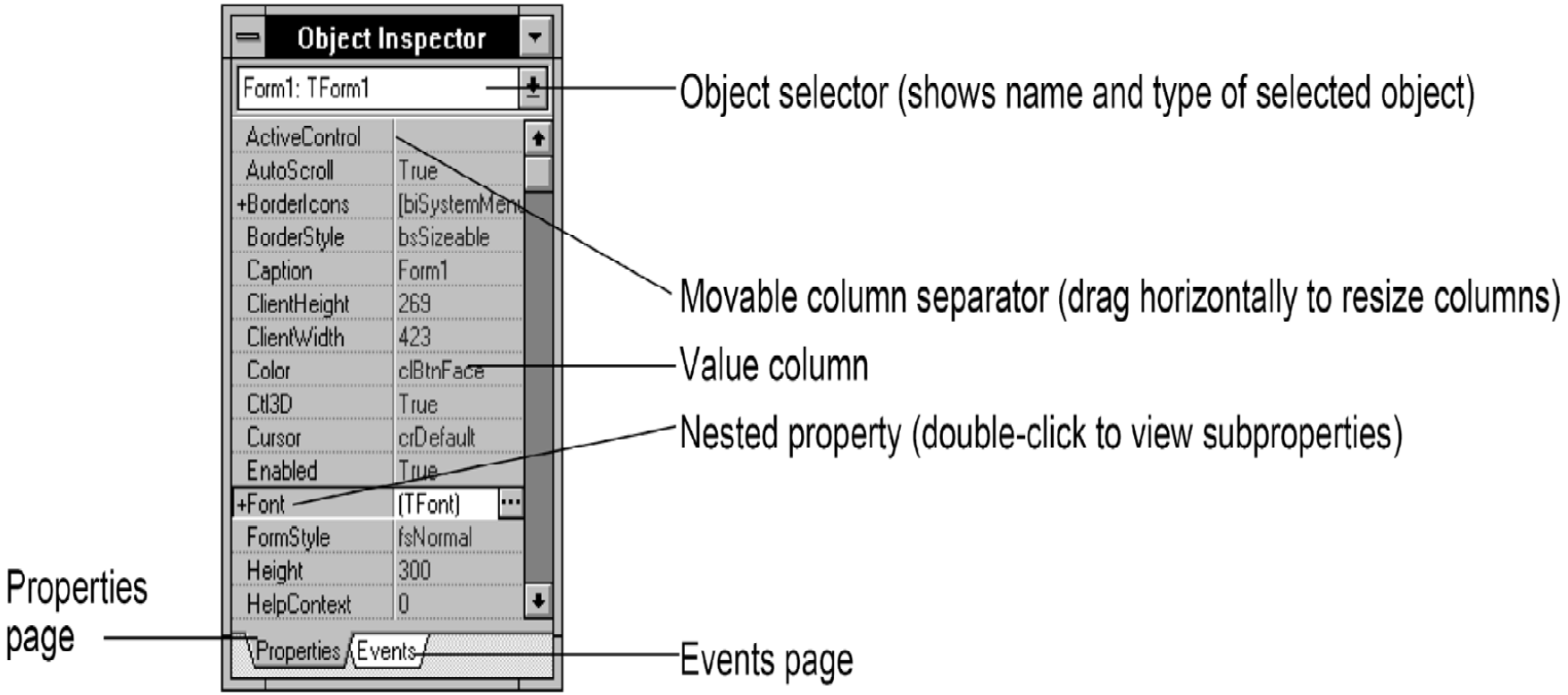
■The Delphi Object Inspector enables you to easily customize the way a component appears and behaves in your application. The properties and events of the component that is selected in the form are displayed in the Object Inspector.

Elements visible upon starting Delphi

- You use the Properties page of the Object Inspector to customize components you've placed on a form (or the form itself), and the Events page to generate and navigate among certain parts of program code, called *event handlers*. Event handlers are specialized procedures.

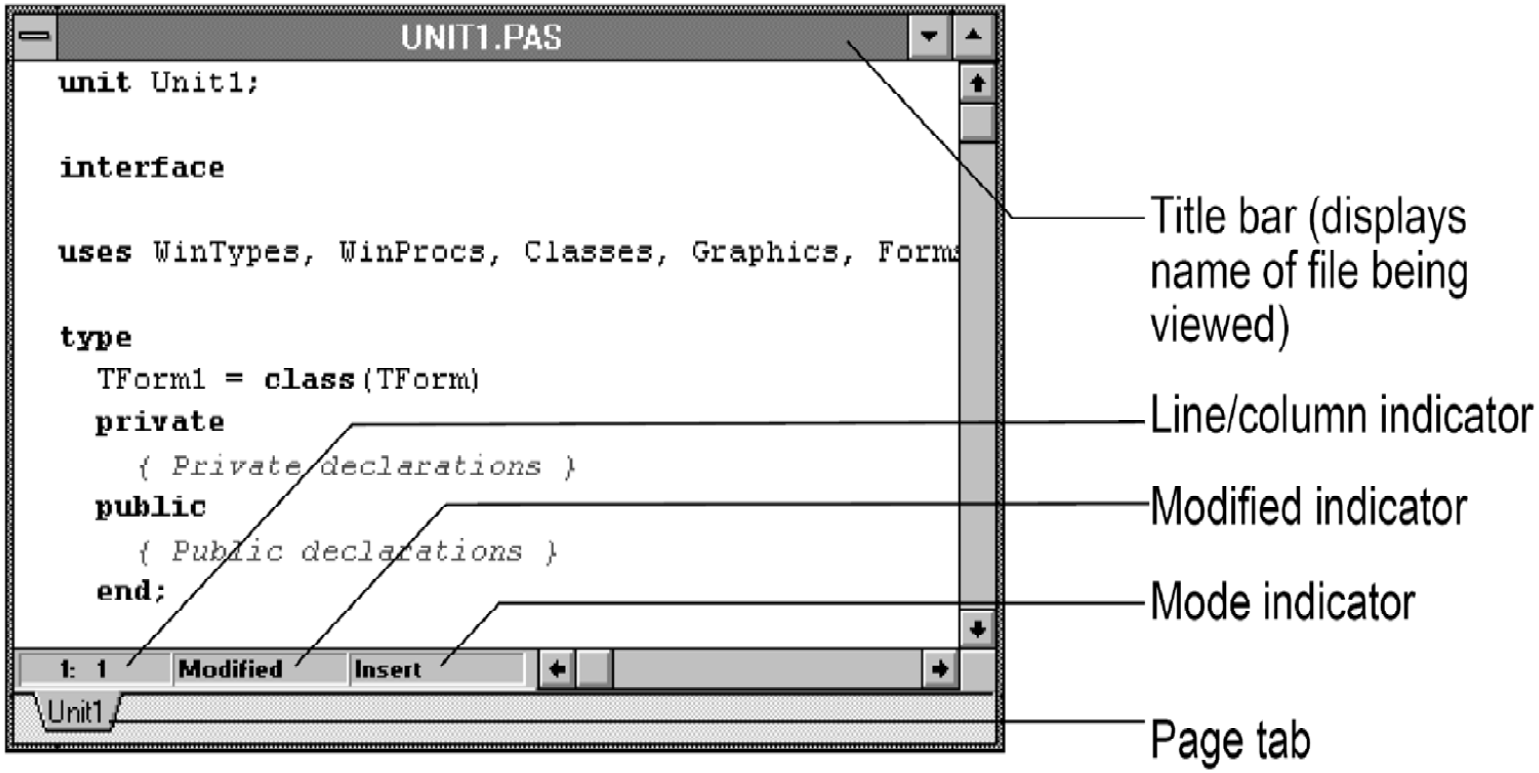
Elements visible upon starting Delphi

☐ Object Inspector



Elements visible upon starting Delphi

☐ Code Editor



Elements visible upon starting Delphi

☐ Code Editor

- The Delphi Code Editor is a full-featured editor that provides access to all the code in a given application project.

- The Code Editor includes many powerful features such as Brief-style editing, color syntax highlighting, and virtually unlimited Undo.

Elements visible upon starting Delphi

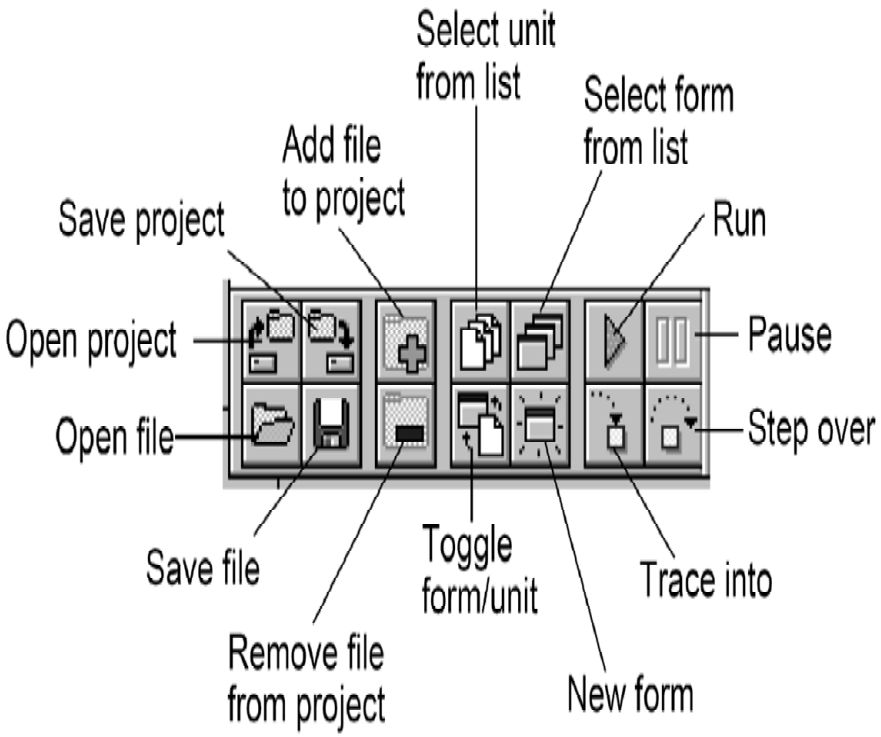
☐ Code Editor

- When you open a new project, Delphi generates a page in the Code Editor for the unit source code (.PAS) file.

- To view the source code for a particular unit, simply click that file's page tab. The Code Editor title bar displays the name of the file in the active page of the Code Editor.

Elements visible upon starting Delphi

☐ SpeedBar



- The Delphi SpeedBar, in its default state, provides you with shortcuts to some of the more common commands from the File, Edit, View, and Debug menus.

Elements not visible upon starting Delphi

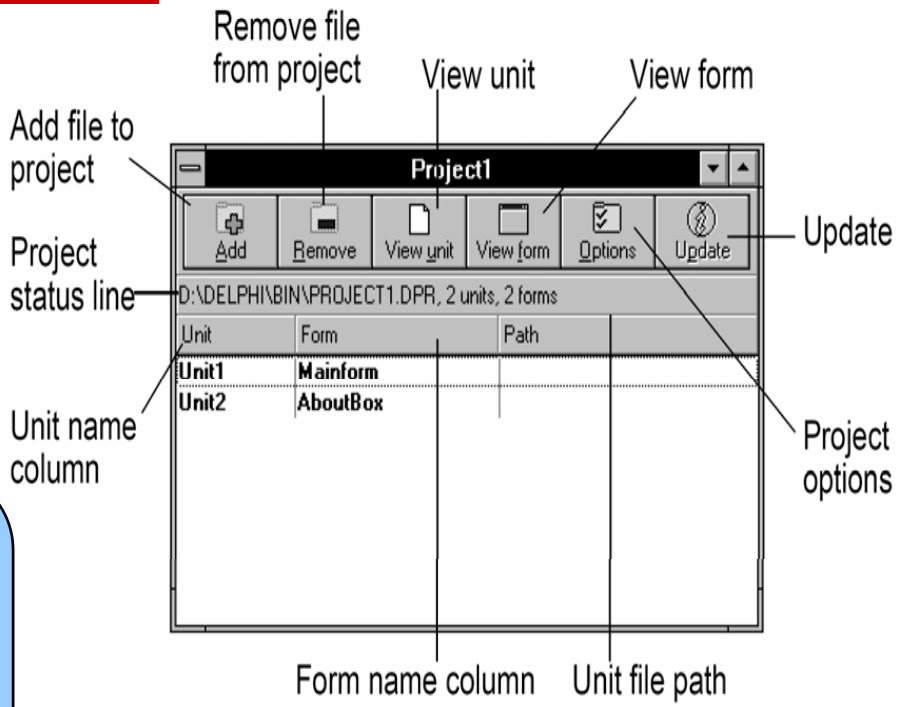
- The following elements of the Delphi interface are not visible when you first start Delphi, but you can access them quickly from the menu bar.

Elements not visible upon starting Delphi

☐ Project Manager

- The Delphi Project Manager lists the files that make up your application, and enables you to easily navigate among them.

- You can use buttons on the Project Manager SpeedBar to generate new forms and units, to view files in the current project, and to save modifications to all opened project files.

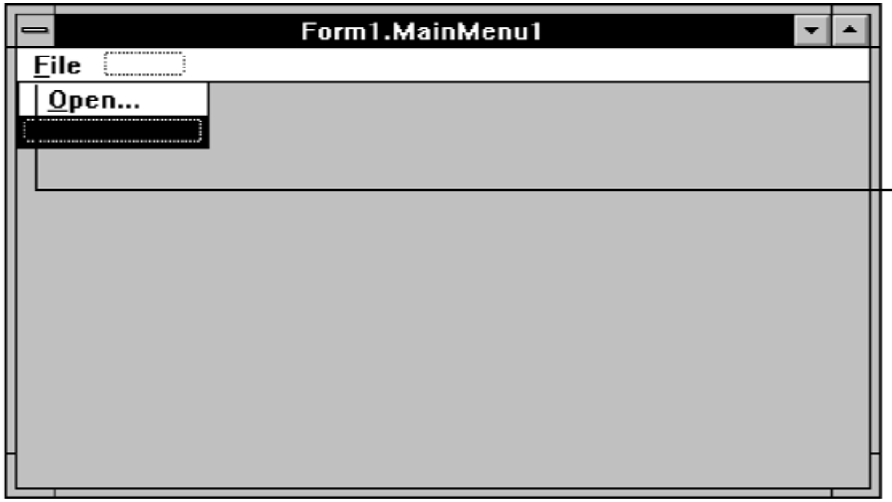


To display the Project Manager, choose View|Project Manager.

Elements not visible upon starting Delphi

☐ Menu Designer

- **The Delphi Menu Designer enables you to easily add menus to your forms.**



Elements not visible upon starting Delphi

☐Integrated debugger

- Delphi provides a fully integrated debugger so you can debug your source code without exiting the development environment.

1.3 The Delphi development model

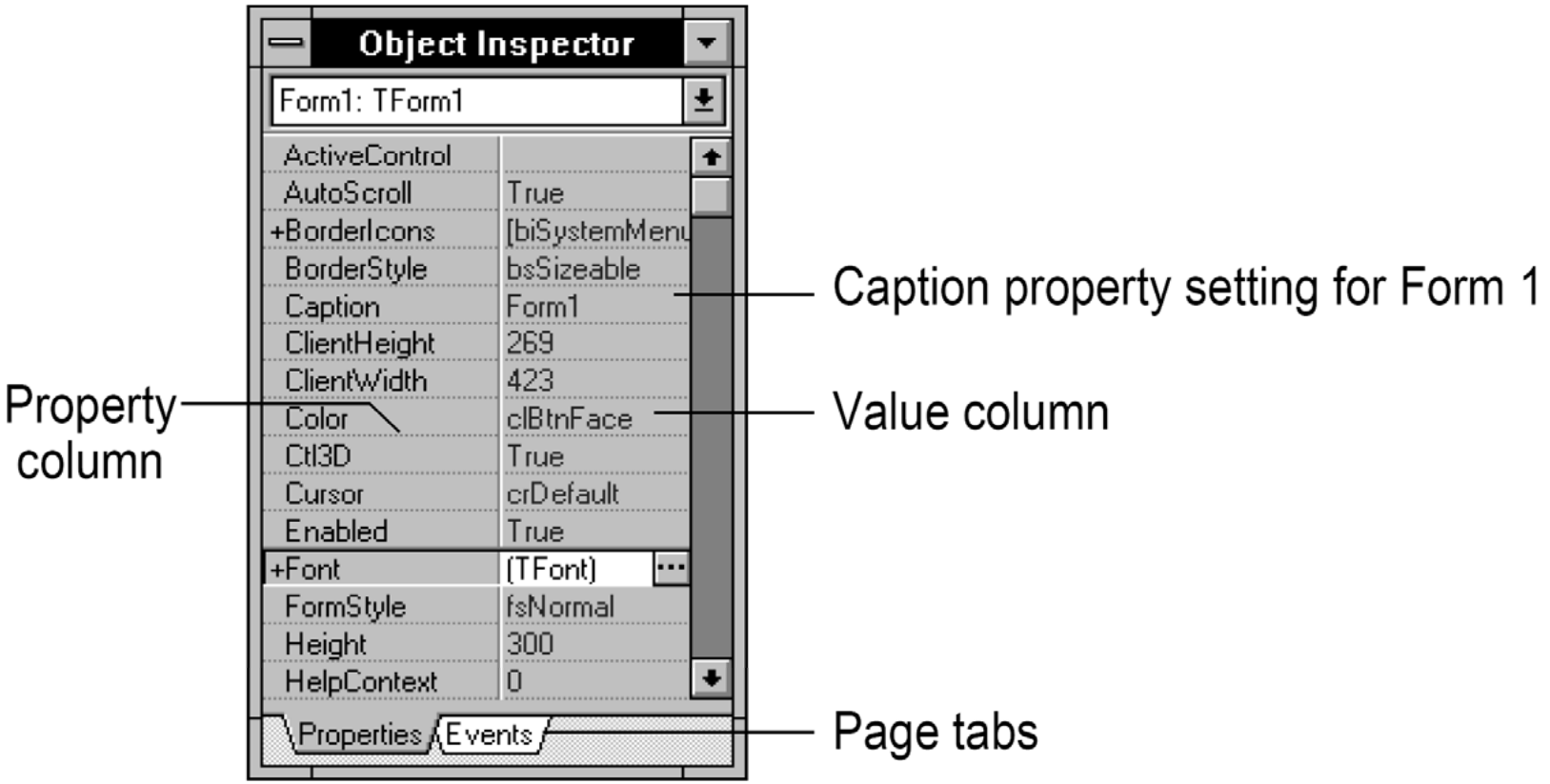
- This section describes the fundamental steps involved in developing your own custom projects with Delphi.

Designing a form

- This section demonstrates the following concepts:

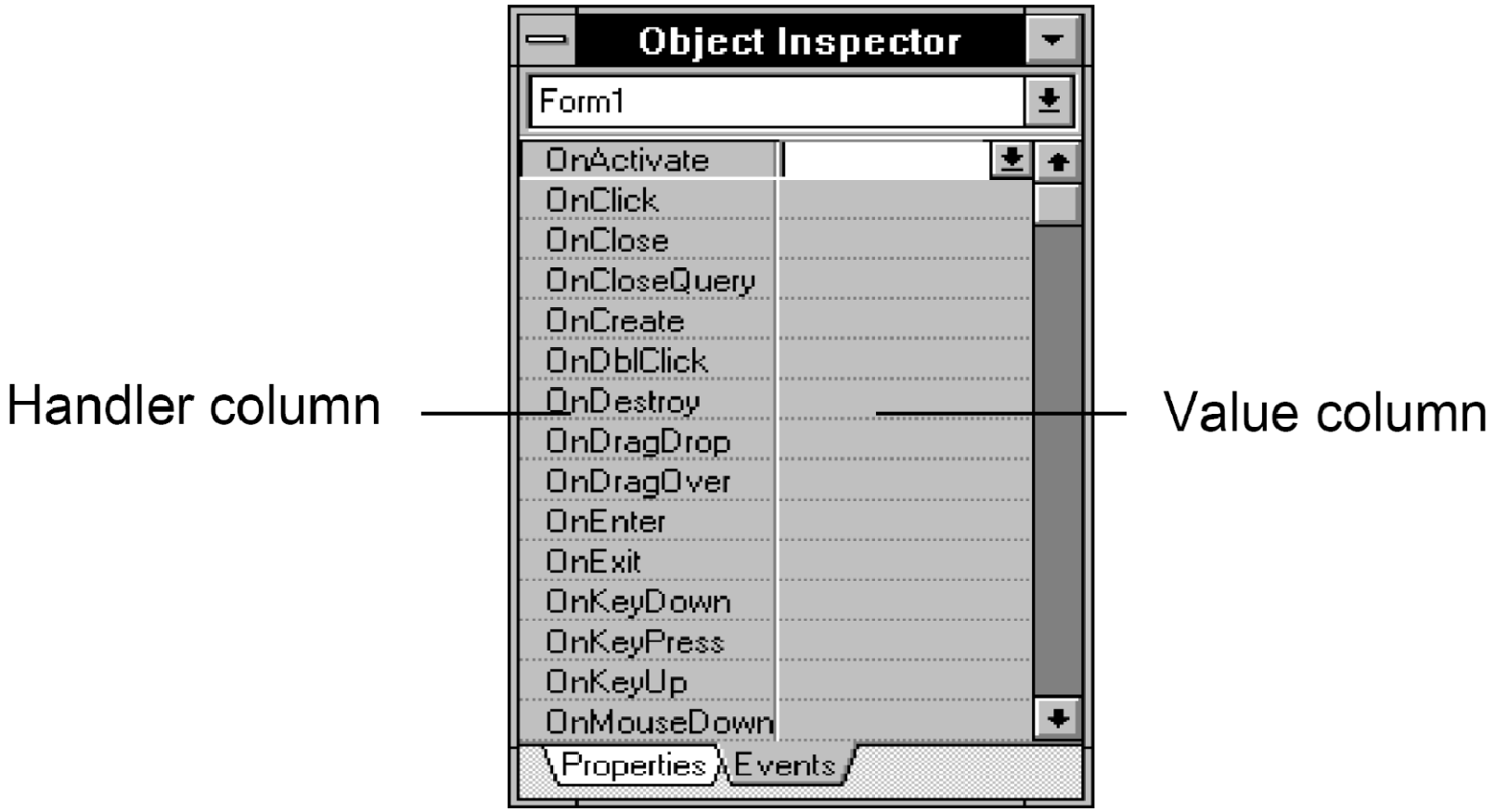
  - Creating a new form
  - Adding components to the form
  - Setting component properties
  - Running the program

Designing a form



Object Inspector with Caption property selected

Handling events



Handling events

- *Events* represent user actions (or internal system occurrences) that your application can recognize.

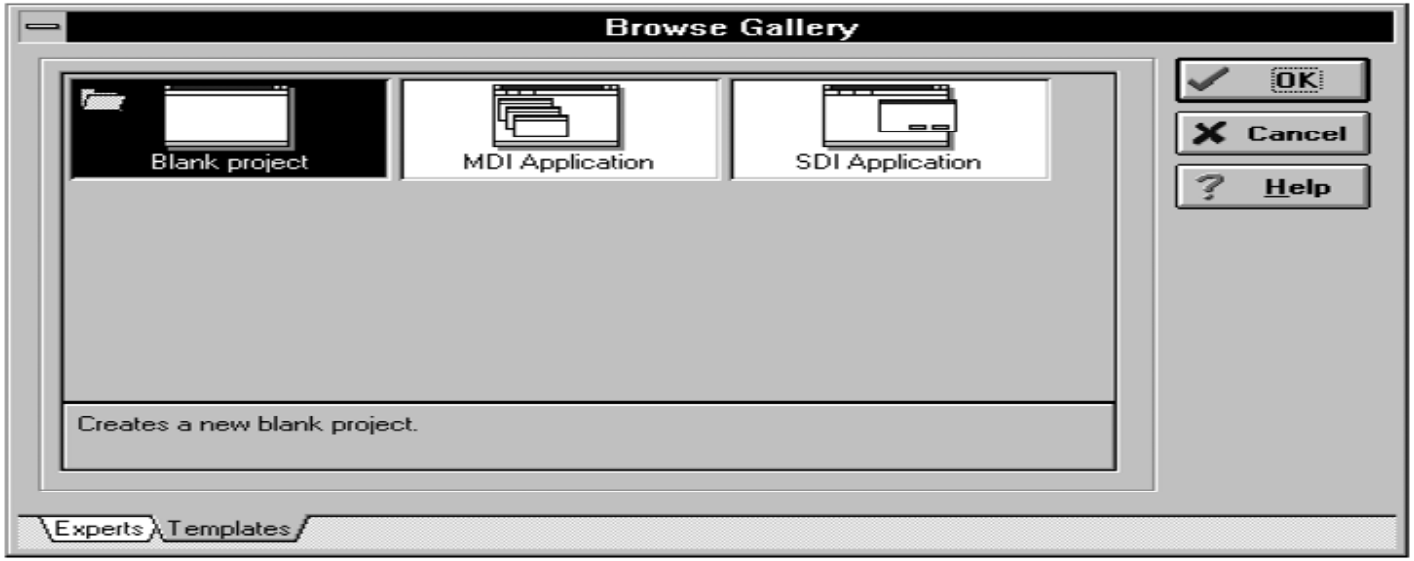
- The Events page of the Object Inspector displays all events associated with the selected component.

Starting a new project

- You can use the New Project command from the File menu to start a new application project, or to open any of the template applications provided with Delphi.

Starting a new project

- To start this project, choose **File|New Project**



Browse Gallery dialog box displaying application templates

Starting a new project

- Calling procedures and functions from event handlers

- So far, this chapter has discussed how to set properties at design time and run time. However, setting properties is only a minor aspect of code development in Delphi.

Starting a new project

- Calling procedures and functions from event handlers

- ***Procedures*** **and** ***functions*****, also known as routines, usually constitute the bulk of your program code.**

Starting a new project

- Calling procedures and functions from event handlers
  - For the sample application, write the following two event handlers:
    - Select *AddBtn*, generate an *OnClick* event handler and type the statement shown inside the begin..end block:

```
procedure TForm1.AddBtnClick(Sender: TObject);
begin
Listbox1.Items.Add(Edit1.Text);
  {add this line of code}
end;
```


Starting a new project

- Calling procedures and functions from event handlers

  - The code you typed calls the *Add* method of the list box in response to a click on the *AddBtn*. The parameter being passed is the *Text* property of *Edit1*. This specifies that when the user clicks *AddBtn*, any text in *Edit1 is added to the items in the list box*.

Starting a new project

- Calling procedures and functions from event handlers

  - Now generate the *OnClick* event handler for *ClearBtn*, and type the statement shown inside the following begin..end block:

```
procedure TForm1.ClearBtnClick(Sender: TObject);
begin
ListBox1.Items.Clear;    {add this line of code}
end;
```


Starting a new project

- Calling procedures and functions from event handlers

  - This code calls the *Clear* method of the list box in response to the *ClearBtn* click. As you might guess, the *Clear* method clears the text from the list box.

1.4 Overview of Delphi projects

- When you create a Delphi application, you can start with a blank project, an existing project, or one of Delphi's application or form templates. A project consists of all the files needed to create your target application.

1.4 Overview of Delphi projects

- This section introduces you to the “core” files in a Delphi project. It discusses the following topics:
  - The project file (.DPR)
  - The unit file (.PAS)
  - The form file (.DFM)
  - Source code for units without forms

The project (.DPR) file

- For each application you develop in Delphi, there is one project (.DPR) file that keeps track of all the unit and form files in the application project.

- When you begin a new project, Delphi generates the project file, and maintains this file throughout the development of the project.

The unit (.PAS) file

- The unit file is the Object Pascal source code file, saved with a .PAS extension.

The form (.DFM) file

- The form is the focal point for programming in Delphi. Whether you're adding components to the form, changing their properties using the Object Inspector, or typing code in the Code Editor for the unit associated with the form, you're really editing the form.

Source code for units without forms

- Although most Delphi units are associated with forms, you may want to create or use units that have no forms associated with them.

- For example, you might create a separately compilable unit of nonvisual objects, or import a library of certain mathematical functions.

Source code for units without forms

- This is the only code that Delphi generates when you add a new unit to a project without adding a form:

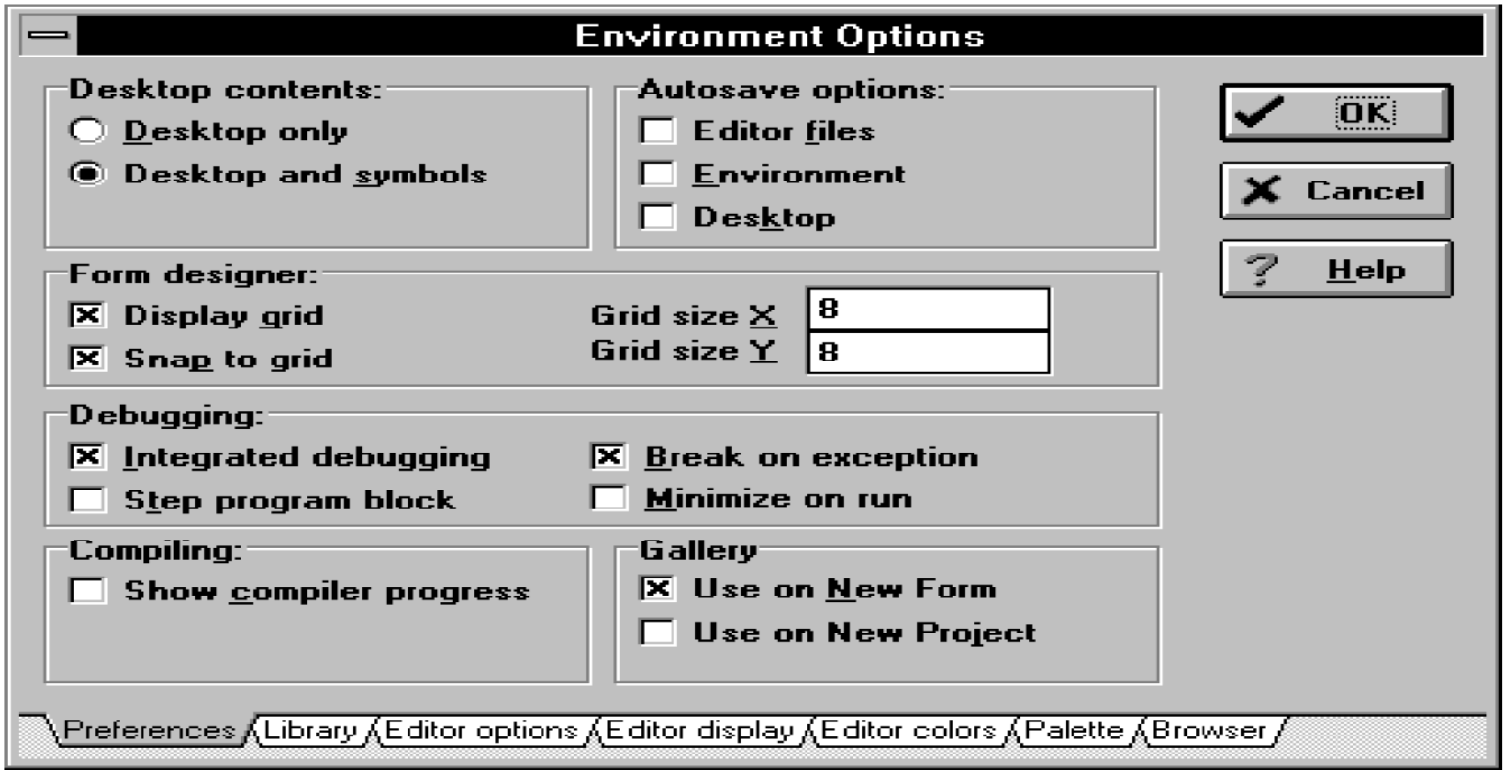
```
unit Unit2;

Interface

implementation

end
```

1.5 Setting environment preferences

Accessing environment options preferences

- To display the Environment Options dialog box, choose Options|Environment from the Delphi menu bar, then choose the Preferences page tab.

Accessing environment options preferences



Environment Options dialog box, Preferences page