

Prak-Shastri 2nd

Computer Science

Unit: 4th

VISUAL FOXPRO

Overview of Visual Foxpro

- Visual FoxPro (VFP) is an object-oriented programming language and data management system developed by Microsoft.
- VFP was designed for creating database applications and it's known for its speed and ability to handle large amounts of data.
- VFP was first released in 1992 and the latest version was 9.0 which was released in 2007.
- VFP is a powerful tool for creating standalone applications, as well as client-server and web-based systems.
- VFP allows to create of forms, reports, and other visual elements with the included form and report designer.
- VFP features a SQL-based query language, which allows for efficient data retrieval from tables and queries.
- VFP allows to create of user-defined functions, procedures, and classes to encapsulate complex logic and reuse code.
- VFP allows the creation and maintains indexes and relationships between tables to improve performance and data integrity.
- VFP has support for various data types such as strings, numbers, dates, and logical data.
- VFP supports the use of object-oriented programming techniques, such as inheritance, polymorphism, and encapsulation.
- VFP has a visual development environment, which includes a variety of tools and wizards to simplify the development process.
- Microsoft ended its support for VFP in 2015.
- Nowadays, most developers use other languages and platforms for development such as .NET, Java, Python, etc.

Characteristics of Visual FoxPro

- **Object-Oriented:** VFP is an object-oriented programming language, which allows for the creation of user-defined classes, objects, and methods.
- **Data-Centric:** VFP is designed to work with data and allows the creation and maintenance of tables, queries, and indexes.
- **SQL-based:** VFP includes a SQL-based query language that allows for efficient data retrieval from tables and queries.
- **Rapid Application Development:** VFP allows for rapid application development with the use of tools and wizards for creating forms, reports, and other visual elements.
- **Visual Development Environment:** VFP features a visual development environment that includes a variety of tools and wizards to simplify the development process.
- **Support for Multiple Data Types:** VFP supports various data types such as strings, numbers, dates, and logical data.
- **Support for Object-Oriented Programming Techniques:** VFP supports the use of object-oriented programming techniques, such as inheritance, polymorphism, and encapsulation.
- **Support for User-Defined Functions:** VFP allows the creation of user-defined functions, procedures, and classes to encapsulate complex logic and reuse code.
- **Support for Data Integrity and Referential Integrity:** VFP allows for the enforcement of data integrity constraints such as primary key, foreign key, and check constraints.
- **Support for Data Relationships:** VFP allows for the creation of complex relationships between tables through the use of primary keys and foreign keys.
- **Support for Data Security:** VFP provides a wide range of security features such as user authentication and access control.

- Support for Data Consistency: VFP ensures that the data in the database is consistent by maintaining referential integrity.
- Support for Scalability: VFP allows for easy scaling of the database by adding more tables, fields, and indexes.
- Not supported anymore: Microsoft ended its support for VFP in 2015.

DBMS is a basic system for storing and retrieving data, an **RDBMS** is a more advanced system that allows for the creation of complex relationships between tables and the enforcement of data integrity through the use of constraints and indexes.

Introduction to Visual FoxPro: The menu system, file types, The Toolbars, Visual Design and Wizards, The Command Window and View window, and Other features of the Visual FoxPro interface.

Visual FoxPro is a relational database management system and programming language developed by Microsoft. It has a variety of features designed to make it easy to create and manage databases, forms, and reports.

1. The menu system: Visual FoxPro has a menu-driven interface that allows users to access all of the program's features and functions. The main menu bar at the top of the screen provides access to various options, such as file management, data manipulation, and report creation.
2. File types: Visual FoxPro supports a variety of file types, including tables, queries, forms, and reports. This allows users to easily import, export, and manipulate data in a variety of formats.
3. Toolbars: Visual FoxPro includes a variety of toolbars that provide quick access to frequently used commands and features. These toolbars can be customized to include only the tools that are needed for a particular task.
4. Visual Design and Wizards: Visual FoxPro includes a visual design feature that allows users to easily create and modify forms and reports using drag-and-drop functionality. It also includes wizards that guide users through the process of creating specific types of forms and reports.
5. The Command Window and View window: The Command Window allows users to enter and execute FoxPro commands directly, whereas the View window is used to view and edit the code of a specific form, report, or program.

6. Other features: Visual FoxPro also includes features such as a built-in programming language, support for multiple data sources, and the ability to create and run programs in a variety of languages. It also has a feature called the "project manager" which allows user to organize their projects and files in a logical manner.

Visual FoxPro is a powerful and versatile tool for creating and managing databases, forms, and reports. Its user-friendly interface, visual design features, and wizards make it easy for users to create and manipulate data.

Tables in Visual FoxPro: Create a new Table, Table wizard, using Table Designer, Using Tables, opening a table, Working on a table, Modifying a table

Tables are an essential component of any database, and Visual FoxPro provides several tools for creating, managing, and working with tables. Here are some key features of working with tables in Visual FoxPro:

1. Create a new Table: Users can create a new table in Visual FoxPro by selecting the "File" menu and choosing "New" > "Table". They can also use the Table Wizard, which guides them through the process of creating a new table.
2. Table wizard: The Table Wizard allows users to create a new table by specifying the fields, data types, and properties for each field. It also allows them to specify relationships between tables and to set up indexes and validation rules.
3. Using Table Designer: Table Designer is a visual tool that allows users to create and modify tables. It provides a graphical interface for specifying fields, data types, and properties, and allows users to set up relationships, indexes, and validation rules.
4. Opening a table: Users can open a table by selecting it from the "File" menu and choosing "Open" > "Table", or by double-clicking on the table in the Project Manager.
5. Working on a table: Once a table is open, users can view and edit its data, add or delete records, and modify the structure of the table. They can also use the built-in data validation and editing features to ensure that data is entered correctly.
6. Modifying a table: Users can modify a table by adding or removing fields, changing the data type of a field, or modifying the properties of a field. They can also use Table Designer to make these changes.

Visual FoxPro provides a variety of tools for working with tables, making it easy for users to create, modify, and manage their data. The Table Wizard, Table Designer, and other features provide a user-friendly interface for working with tables and ensure that data is entered correctly.

Managing Data: Switching from Browse to Edit display, Entering and Editing Data, appending data, editing data, moving through a Table, Go To Record commands, Find and Replace, delete a Record, Altering the Display of the Browse Window

Visual FoxPro provides several tools for managing data in tables, including the ability to switch between Browse and Edit display modes, enter and edit data, move through a table, and perform various other operations. Here are some key features of managing data in Visual FoxPro:

1. **Switching from Browse to Edit display:** Users can switch between Browse and Edit display modes by selecting the "View" menu and choosing "Browse" or "Edit". In Browse mode, users can view the data in a table, but cannot edit it. In Edit mode, users can edit the data in a table.
2. **Entering and Editing Data:** Users can enter and edit data in a table by switching to Edit mode and entering data into the fields. They can also use the built-in data validation and editing features to ensure that data is entered correctly.
3. **Appending data:** Users can add new records to a table by selecting "File" > "Append" or by using the Append Blank button in the Browse window.
4. **Moving through a Table:** Users can move through a table by using the navigation buttons in the Browse window or by using keyboard shortcuts. The Go To Record command allows users to move to a specific record in a table.
5. **Find and Replace:** Users can search for specific data in a table and replace it with new data using the Find and Replace feature. This feature can be accessed from the "Edit" menu.
6. **Deleting a Record:** Users can delete records from a table by selecting the record and pressing the Delete key, or by using the Delete Record button in the Browse window.

7. Altering the Display of the Browse Window: Users can change the way the data is displayed in the Browse window by altering the font size, column width, and other display options. They can also change the order of the columns and sort the data.

Visual FoxPro provides a variety of tools for managing data in tables, including the ability to switch between Browse and Edit display modes, enter and edit data, move through a table, and perform various other operations. Users can easily search, replace, delete, and modify the data according to their requirements.

Using Queries: Creating a Query Wizard, Query Designer, Running the Query, Using the Query, the Cross Tab Wizard, Modifying the Query, The Query Designer.

In Visual FoxPro, Queries are used to extract specific information from one or more tables. The Query Wizard and Query Designer are tools that allow the user to create and modify queries. The Query Wizard guides the user through the process of creating a query by asking a series of questions. The Query Designer allows the user to create and modify queries by visually designing the query structure.

Once a query is created, it can be run by clicking the "Run" button or by entering the query name in the Command Window. The results of the query are displayed in the View Window. The user can then use the data in the query for further analysis or to create reports.

In Visual FoxPro, you can create a query using the Query Wizard. To do this, follow these steps:

1. Open the Database Designer by going to the File menu and selecting "New."
2. In the Database Designer, select "Query" from the list of options.
3. Click the "Wizard" button to launch the Query Wizard.
4. Follow the prompts in the wizard to select the tables and fields you want to include in the query.
5. Use the options in the wizard to specify any sorting or filtering criteria you want to apply to the query.
6. Give the query a name and click "Finish" to create the query.

Once you have created the query, you can use it to retrieve data from the tables you selected in the wizard. You can also modify the query's design in the Database Designer.

Running the Query

Once you have created a query in Visual FoxPro, you can run it to retrieve the data that it is designed to retrieve. To run a query, you can follow these steps:

1. Open the Database Designer by going to the File menu and selecting "New."
2. In the Database Designer, select the query you want to run from the list of options.
3. Click the "Run" button, or press the F5 key, to execute the query.

The results of the query will be displayed in the Data Session window, which will open automatically when you run the query. You can use the tools in the Data Session window to view, sort, and export the query's results.

Alternatively, you can also use the SQL SELECT statement to run the query and retrieve data from the database.

You can also use the command "USE" followed by the query name to use the query and retrieve data from the database.

Example:

```
USE MyQuery
```

This will open the query and will retrieve the data based on the query definition.

Using the Query with the Cross Tab Wizard

In Visual FoxPro, you can use the Cross Tab Wizard to create a cross-tabulation query, also known as a crosstab query, which allows you to view and analyze data in a pivot table format. A crosstab query is a special type of query that aggregates data across multiple fields and groups the results by one or more fields. To use a query with the Cross Tab Wizard, you can follow these steps:

1. Open the Database Designer by going to the File menu and selecting "New."
2. In the Database Designer, select the query you want to use with the Cross Tab Wizard from the list of options.
3. Click the "Wizard" button to launch the Cross Tab Wizard.
4. Follow the prompts in the wizard to select the fields you want to use for the rows, columns, and values of the crosstab query.
5. Use the options in the wizard to specify any sorting or filtering criteria you want to apply to the crosstab query.
6. Give the crosstab query a name and click "Finish" to create the query.

Once you have created the crosstab query, you can run it to retrieve the data that it is designed to retrieve, in the format of a pivot table. You can also modify the crosstab query's design in the Database Designer.

Alternatively, you can use the SQL SELECT statement with the GROUP BY clause and aggregate functions like COUNT, SUM, AVG, etc, to create a crosstab query.

For Example:

SQL

```
SELECT field1, field2, COUNT (field3) FROM table1 GROUP BY field1, field2
```

This will group the data based on field 1 and field 2 and will count field 3, which will give you the results in crosstab format.

Modifying the Query

Once you have created a query in Visual FoxPro, you can modify it to change the tables, fields, sorting, and filtering criteria that it uses to retrieve data. To modify a query, you can follow these steps:

1. Open the Database Designer by going to the File menu and selecting "New."
2. In the Database Designer, select the query you want to modify from the list of options.
3. Make any changes you want to the query's design. You can add or remove tables, fields, or criteria, change the way the query's results are sorted, and more.
4. Save the changes you've made to the query by clicking the "Save" button, or by going to the File menu and selecting "Save."

Alternatively, you can also use the SQL Select statement to modify the query.

For Example :

vbnet

```
SELECT field1, field2, field3 FROM table1 WHERE field1=value1 ORDER BY field2
```

You can also use the SQL UPDATE statement to update the existing data in the database based on the query.

Example:

sql

```
UPDATE table1 SET field1=newvalue1 WHERE field2=value2
```

This will update the existing data in the table1 where field2 is value2 and set field1 to newvalue1

Once you've modified the query, you can run it again to retrieve the updated data.

Cross Tab Wizard

The Cross Tab Wizard is a tool that allows the user to create a cross-tabulation query, which is a query that displays data in a tabular format. The user can modify the query by using the Query Designer, which allows the user to select specific fields, set conditions, and specify sort orders.

Overall, Queries are an essential tool in Visual FoxPro, they allow you to extract the specific data that you need and make it easy to work with large sets of data.

Datatypes

In Visual FoxPro 6.0, data types are used to define the type of data that a variable or field can hold. The most commonly used data types in Visual FoxPro 6.0 include:

- **Character:** A character is a sequence of characters used to store text data. It is denoted by the "C" in the field definition.
- **Numeric:** A numeric data type is used to store numeric values. It is denoted by the "N" in the field definition.
- **Date:** A date data type is used to store date and time values. It is denoted by the "D" in the field definition.
- **Logical:** A logical data type is used to store Boolean values (True or False). It is denoted by the "L" in the field definition.
- **Currency:** A currency data type is used to store monetary values. It is denoted by the "Y" in the field definition.
- **Memo:** A memo data type is used to store large amounts of text data. It is denoted by the "M" in the field definition.
- **Integer:** An integer data type is used to store whole numbers. It is denoted by the "I" in the field definition.

It's important to choose the appropriate data type when creating variables and fields in your FoxPro program in order to ensure that the data is stored and used correctly.

Visual FoxPro 6.0, operators

In Visual FoxPro 6.0, operators are used to perform various operations on data and variables. Some of the most commonly used operators in Visual FoxPro 6.0 include:

- **Arithmetic operators:** These operators perform basic arithmetic calculations such as addition (+), subtraction (-), multiplication (*), and division (/).

- **Comparison operators:** These operators compare two values and return a logical value based on the comparison. They include equal to (==), not equal to (<>), greater than (>), less than (<), greater than or equal to (>=), and less than or equal to (<=).
- **Logical operators:** These operators perform logical operations such as AND, OR and NOT. They are used to combine multiple comparisons or conditions.
- **Concatenation operator:** This operator is used to join two or more strings together. The operator is the ampersand symbol (&).
- **Conditional operator:** This operator is used to assign a value based on a condition. The operator is the question mark (?).
- **Membership operator:** This operator is used to test for the presence of a value within a range or a set of values. The operator is the IN keyword.
- **Like operator:** This operator is used to match a string against a pattern. It uses the wildcard characters * and ?. The operator is the LIKE keyword.

It's important to use the correct operator for the operation you're trying to perform, in order to avoid errors in your code and to get the desired result.

Components of Visual Foxpro Database

A Visual FoxPro database is made up of several components that work together to store, manage, and retrieve data. These components include:

- **Tables:** Tables are the basic building blocks of a Visual FoxPro database and are used to store data in a tabular format. Each table has a set of fields (columns) that define the types of data that can be stored in the table, and a set of records (rows) that contain the actual data.
- **Fields:** Fields are the individual columns within a table that define the types of data that can be stored in the table. Each field has a name and a data type, such as string, number, date, or logical.
- **Indexes:** Indexes are used to speed up the retrieval of data from tables. They are like a "road map" that helps Visual FoxPro quickly find specific records in a table. Indexes can be created on one or more fields in a table and can be either ascending or descending.

- **Queries:** Queries are used to retrieve specific data from one or more tables based on a set of conditions. They are created using SQL (Structured Query Language) and can be used to filter, sort, and join data from multiple tables.
- **Forms:** Forms are used to create user interfaces for data entry and editing. They allow users to interact with the data in a table by displaying the fields in a visually pleasing way, and providing features such as data validation, navigation, and data entry.
- **Reports:** Reports are used to present data in a formatted, easy-to-read way. They can be created using the Report Designer, which allows users to customize the layout, font, and other formatting options.
- **Procedures:** Procedures are blocks of code that can be called by other code to perform specific tasks. They can be used to encapsulate complex logic, reduce code duplication, and improve the maintainability of a program.
- **Classes:** Classes are used to define the properties and methods of objects. They can be used to create a blueprint for objects, and to encapsulate data and behavior.

All these components work together to store, manage, and retrieve data in a Visual FoxPro database.

Create a database

To create a database in Visual FoxPro 6.0, you can follow these steps:

1. From the File menu, select New and then Database.
2. In the New Database dialog box, specify the location and name of the new database.
3. Select a data type for the database, such as dBase III, FoxPro 2.5, or Free Table.
4. Click OK to create the new database.
5. Once the new database is created, you can add tables to it by using the File > New > Table command, or by importing existing tables from other sources.
6. To add fields to a table, you can use the Design option in the File menu.
7. To add data to the table, you can use the Data option in the File menu.
8. To create relationships between tables, you can use the Relationships option in the File menu.

Visual FoxPro 6.0 is an old version and is not supported anymore. If you are planning to work with databases, it's recommended to use a more recent version of Visual FoxPro or other database management systems that have more advanced features and support.

Creating a Database:

- To create a new database in Visual FoxPro 6.0, use the CREATE DATABASE command. The syntax for the command is: CREATE DATABASE databaseName
- For example: CREATE DATABASE MyDB

Adding new records:

- To add new records to a table in Visual FoxPro 6.0, use the APPEND command. The syntax for the command is: APPEND BLANK
- This will create a new blank record in the table. You can then use the REPLACE command to add data to the fields of the new record.

Editing a record:

- To edit a record in a table in Visual FoxPro 6.0, you can use the SEEK command to locate the record, and then use the REPLACE command to edit the fields of the record.
- The syntax for the SEEK command is: SEEK search Expression
- For example: SEEK "Ashok"
- Once you have located the record, you can use the REPLACE command to edit the fields. The syntax for the REPLACE command is: REPLACE fieldName WITH newValue
- For example: REPLACE Phone WITH "555-555-5555"

Renaming a field:

- To rename a field in a table in Visual FoxPro 6.0, you can use the MODIFY STRUCTURE command. The syntax for the command is: MODIFY STRUCTURE fieldName TO newField Name
- For example: MODIFY STRUCTURE Phone TO Telephone

Displaying a database:

- To display the contents of a table in Visual FoxPro 6.0, you can use the BROWSE command. The syntax for the command is: BROWSE
- This will open a Browse window that displays the contents of the table. You can also use the SELECT command to display the contents of a specific table or query. The syntax for the SELECT command is: SELECT tableName
- For example SELECT Customers

Several Commands

Visual FoxPro 6.0 is a programming language and database management system that includes a wide variety of commands for working with data and program flow. Some of the most commonly used commands in Visual FoxPro 6.0 include:

- SELECT: opens a table or a query and makes it the current table.
- USE: opens a table and makes it the current table.
- BROWSE: opens a table in a browsable window.
- CLOSE: closes a table or a query.
- COPY TO: creates a copy of a table.
- APPEND FROM: adds the data from one table to another table.
- DELETE: deletes the current record or a selected set of records.
- PACK: removes deleted records from a table.
- ZAP: deletes all records from a table and resets the table's structure.
- INDEX ON: creates an index on one or more fields of a table.
- SET ORDER TO: sets the order of the records in a table.
- GO TOP: moves to the first record of a table.
- GO BOTTOM: moves to the last record of a table.
- SKIP: moves a specified number of records forward or backward.
- SEEK: locates a record in a table based on a value in one of its fields.
- LOCATE: locates a set of records in a table based on a condition.
- FIND: locates the first occurrence of

Visual FoxPro 6.0 is a programming language and database management system that includes a wide variety of commands for working with data and program flow. Some of the most commonly used commands in Visual FoxPro 6.0 and their syntax include:

- SELECT: opens a table or a query and makes it the current table. Syntax: SELECT [table name]
- USE: opens a table and makes it the current table. Syntax: USE [table name]
- BROWSE: opens a table in a browsable window. Syntax: BROWSE [table name]
- CLOSE: closes a table or a query. Syntax: CLOSE [table name]
- COPY TO: creates a copy of a table. Syntax: COPY TO [new table name]
- APPEND FROM: adds the data from one table to another table. Syntax: APPEND FROM [table name]

- DELETE: deletes the current record or a selected set of records. Syntax: DELETE [condition]
- PACK: removes deleted records from a table. Syntax: PACK [table name]
- ZAP: deletes all records from a table and resets the table's structure. Syntax: ZAP [table name]
- INDEX ON: creates an index on one or more fields of a table. Syntax: INDEX ON [field name] TO [index name]
- SET ORDER TO: sets the order of the records in a
- INDEX ON <fields> TAG <index name>: creates an index on one or more fields of a table.
- SET ORDER TO <index name>: sets the order of the records in a table.
- GO TOP: moves to the first record of a table.
- GO BOTTOM: moves to the last record of a table.
- SKIP <number of records>: moves a specified number of records forward or backward.
- SEEK <value>

Practice Question

1. What are the different datatypes supported by Visual FoxPro and how are they used in programming?
2. How does Visual FoxPro handle databases and what is the proprietary format used for storing data?
3. Can you explain the structure of a table in Visual FoxPro and the difference between a record and a field?
4. How does the query system work in Visual FoxPro and what are some examples of common query commands?
5. What is the role of commands in Visual FoxPro and can you provide examples of commonly used commands?
6. How does Visual FoxPro handle relationships between tables in a database?
7. Can you explain how to create and modify a table in Visual FoxPro?
8. What are the different types of datatypes in Visual FoxPro?

9. How does Visual FoxPro handle databases and tables, and what are the differences between records and fields?
10. Can you explain the use of queries in Visual FoxPro, and provide examples of some common commands used in the language?

Computer Notes