



MATLAB

Database Toolbox

What Is the Database Toolbox?

- The Database Toolbox is one of an extensive collection of toolboxes for use with MATLAB . The Database Toolbox enables you to move data (both importing and exporting) between MATLAB and popular relational databases .
- With the Database Toolbox, you can bring data from an existing database into MATLAB, use any of MATLAB's computational and analytic tools, and store the results back in the database or in another database. You read from the database, importing the data into the MATLAB workspace.
- For example, a financial analyst working on a mutual fund could import a company's financial data into MATLAB, run selected analyses, and store the results for future tracking. The analyst could then export the saved results to a database.

How Databases Connect to MATLAB?

- The Database Toolbox connects MATLAB to a database using MATLAB functions. Data is retrieved from the database as a string, parsed into the correct data types, and stored in a MATLAB cell array. At that point, you use MATLAB's extensive set of tools to work with the data. You can include Database Toolbox functions in MATLAB M-files. To export the data from MATLAB to a database, you use MATLAB functions.
- The Database Toolbox also comes with the Visual Query Builder (VQB), an easy-to-use graphical user interface for retrieving data from your database. With the VQB, you build queries to retrieve data by selecting information from lists rather than by entering MATLAB functions. The VQB retrieves the data into a MATLAB cell array so you then can process the data using MATLAB's suite of functions. With the VQB, you can display the retrieved information in relational tables, reports, and charts.

Features of the Database Toolbox

- Data types are automatically preserved in MATLAB – No data massaging or manipulation is required. The data is stored in cell arrays, which support mixed data types.
- Different databases can be used in a single session – Import data from one database, perform calculations, and export the modified or unmodified data to another database. Multiple databases can be open during a session.
- Database connections remain open until explicitly closed – Once connection to a database has been established, it remains open during the entire MATLAB session until you explicitly close it. This improves access and reduces the number of functions necessary to import/export data.
- Retrieval of large data sets or partial data sets – You can retrieve large data sets from a database in a single fetch or in discrete amounts using multiple fetches.

Features of the Database Toolbox

- Retrieval of database metadata – You do not need to know the table names, field names, and properties of the database structure to access the database, but can retrieve that information using Database Toolbox functions.
- Visual Query Builder – If you are unfamiliar with SQL, you can retrieve information from databases via this easy-to-use graphical interface.

Installing the Database Toolbox

- **Setting Up a Data Source :**

Before you can connect from the Database Toolbox to a database, you need to set up a data source, such as [driver](#), [directory](#), [server](#), or network names. You assign a name to each data source.

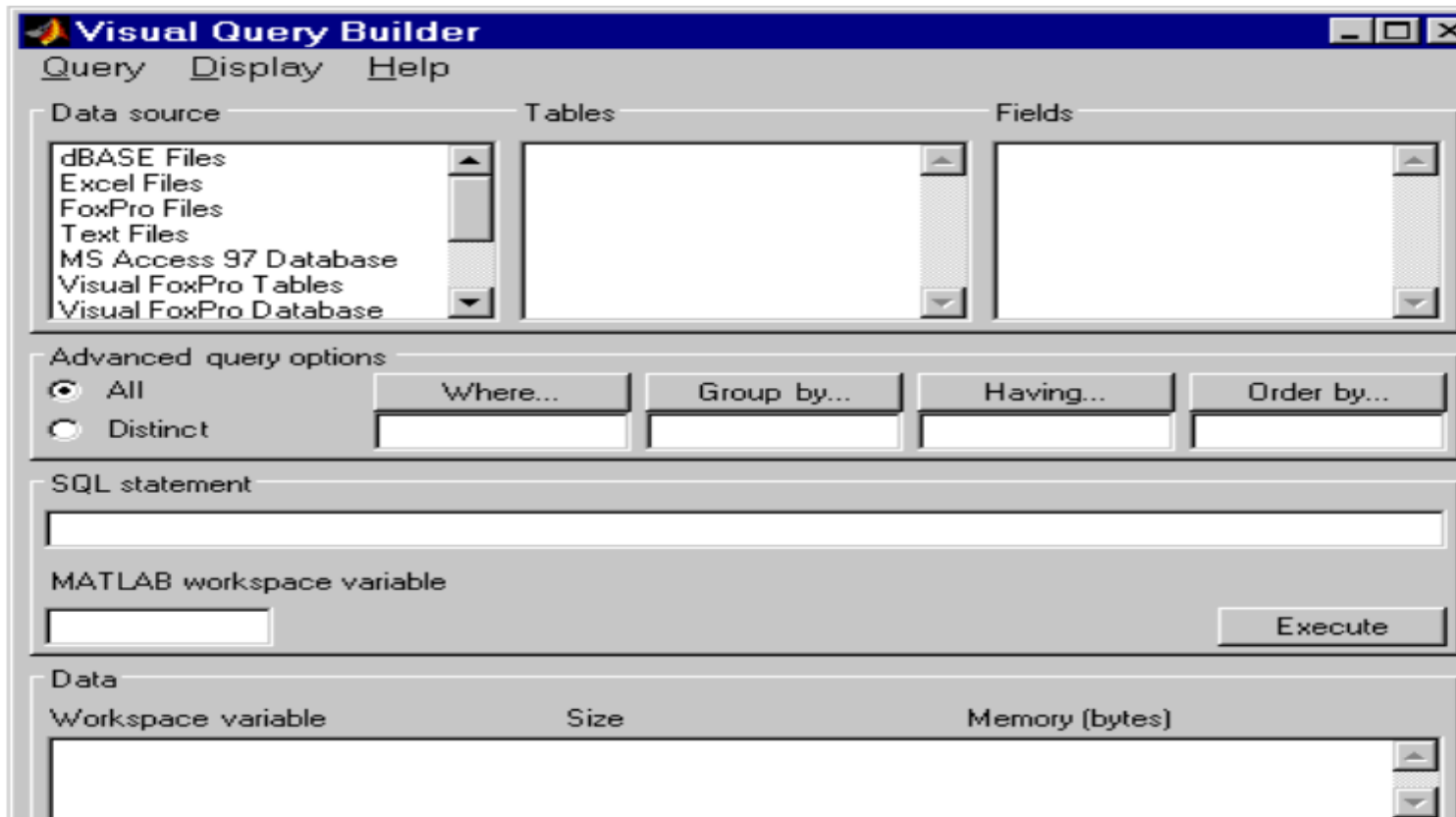
- **The instructions for setting up a data source differ slightly depending on your configuration. Use one of these sets of instructions:**
- For MATLAB PC platforms whose database resides on that PC, use “Setting Up a Local Data for ODBC Drivers” on page 1-6.
- For MATLAB PC platforms whose database resides on another system to which the PC is networked, use “Setting Up a Remote Data Source for ODBC Drivers” on page 1-8.
- For MATLAB platforms that connect to a database via a JDBC driver, use “Setting Up a Data for JDBC Drivers” on page 1-12.

Starting the Database Toolbox

- To use the Database Toolbox functions, just type the function you want to use. For more information, see “Tutorial for Functions” on page 3-1.
- To start the Visual Query Builder, type query builder . For more information, see “Visual Query Builder Tutorial” on page 2-1.

Starting the Visual Query Builder

The **Visual Query Builder** dialog box appears.



To Quit : from Query ,Select **EXIT**

Visual Query Builder Interface Tutorial

9 View query results in table, chart, and report formats.

10 Save, load, and run queries.

1 Select the data source.

2 Select the tables.

3 Select the fields you want to retrieve.

4 Refine the query, if needed.

5 View the SQL statement.

6 Assign a variable for the results.

7 Run the query.

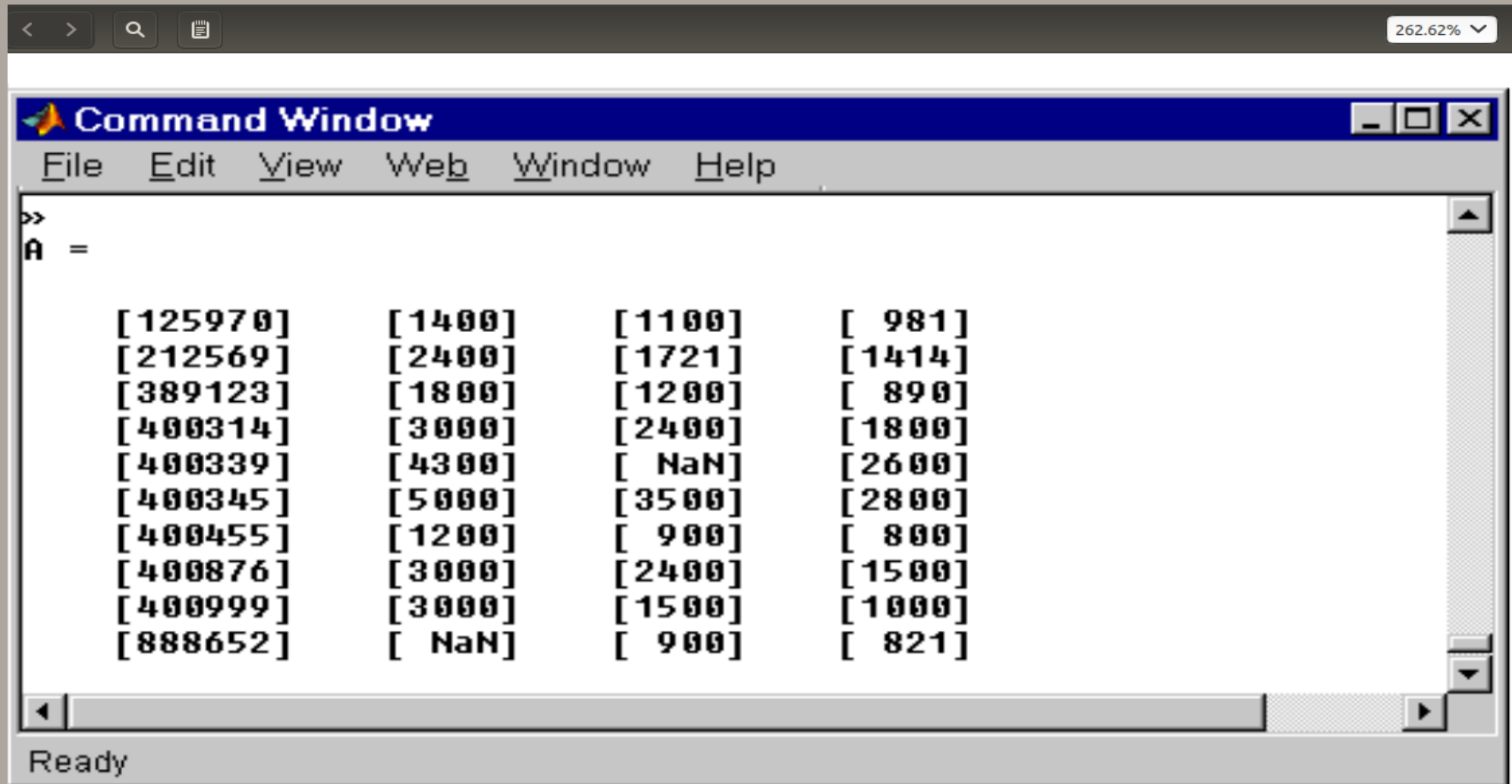
8 Double-click to view query results in the MATLAB command window.

The screenshot shows the Visual Query Builder window with the following components and annotations:

- Data source:** A list box containing 'FoxPro Files', 'Text Files', 'MS Access 97 Database', 'Visual FoxPro Tables', 'Visual FoxPro Database', 'dbtoolboxdemo' (selected), and 'SampleDB'. Annotation 1 points to this list.
- Tables:** A list box containing 'inventoryTable', 'productTable', 'salesVolume' (selected), 'suppliers', 'yearlySales', and 'display'. Annotation 2 points to this list.
- Fields:** A list box containing 'StockNumber' (selected), 'January', 'February', 'March', 'April', 'May', and 'June'. Annotation 3 points to this list.
- Advanced query options:** Includes radio buttons for 'All' (selected) and 'Distinct'. Below them are buttons for 'Where...', 'Group by...', 'Having...', and 'Order by...'. The 'Where...' button has a dropdown showing 'StockNumber >'. Annotation 4 points to the 'All' radio button.
- SQL statement:** A text box containing the query: 'SELECT ALL StockNumber,March FROM salesVolume WHERE StockNumber > 400000'. Annotation 5 points to this text box.
- MATLAB workspace variable:** A text box containing 'A'. Annotation 6 points to this text box.
- Execute:** A button labeled 'Execute'. Annotation 7 points to this button.
- Data:** A table showing the results of the query. It has three columns: 'Workspace variable', 'Size', and 'Memory (bytes)'. The first row shows 'A' with size '7x2' and memory '1400'. Annotation 8 points to the 'A' in the first row.

Workspace variable	Size	Memory (bytes)
A	7x2	1400

Visual Query Builder Interface Tutorial



Viewing Query Results

- After running a query in the Visual Query Builder, you can view :
- The retrieved data in the MATLAB command window, as described “Building, Running, and Saving a Query” .
- A “Relational Display of Data” on page 2-13.
- A “Chart Display of Results” on page 2-16; for example, a pie chart.
- A “Report Display of Results in a Table” on page 2-19.
- A “Display of Results in the Report Generator” on page 2-20

Viewing Query Results

- **1- Relational Display of Data :**

1 After executing a query, select Data from the Display menu. The query results appear in a figure window.

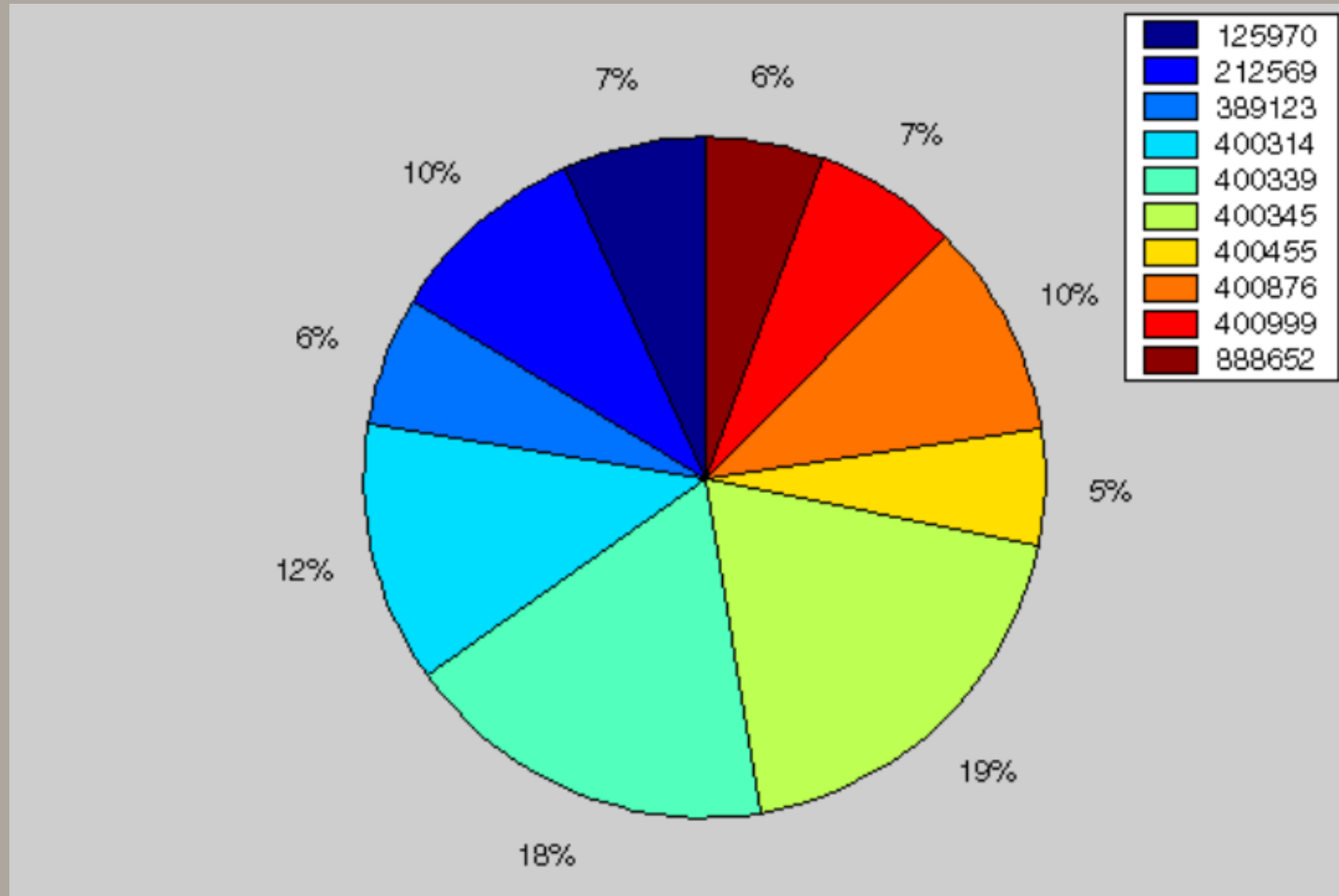
StockNumber	January	February	March
125970	0	0	800
212569	1200	900	821
389123	1400	1100	890
400314	1800	1200	981
400339	2400	1500	1000
400345	3000	1721	1500
400455	4300	2400	1800
400876	5000	3500	2600
400999			2800
888652			

Click on a text object

Viewing Query Results

- **2- Chart Display of Results :**

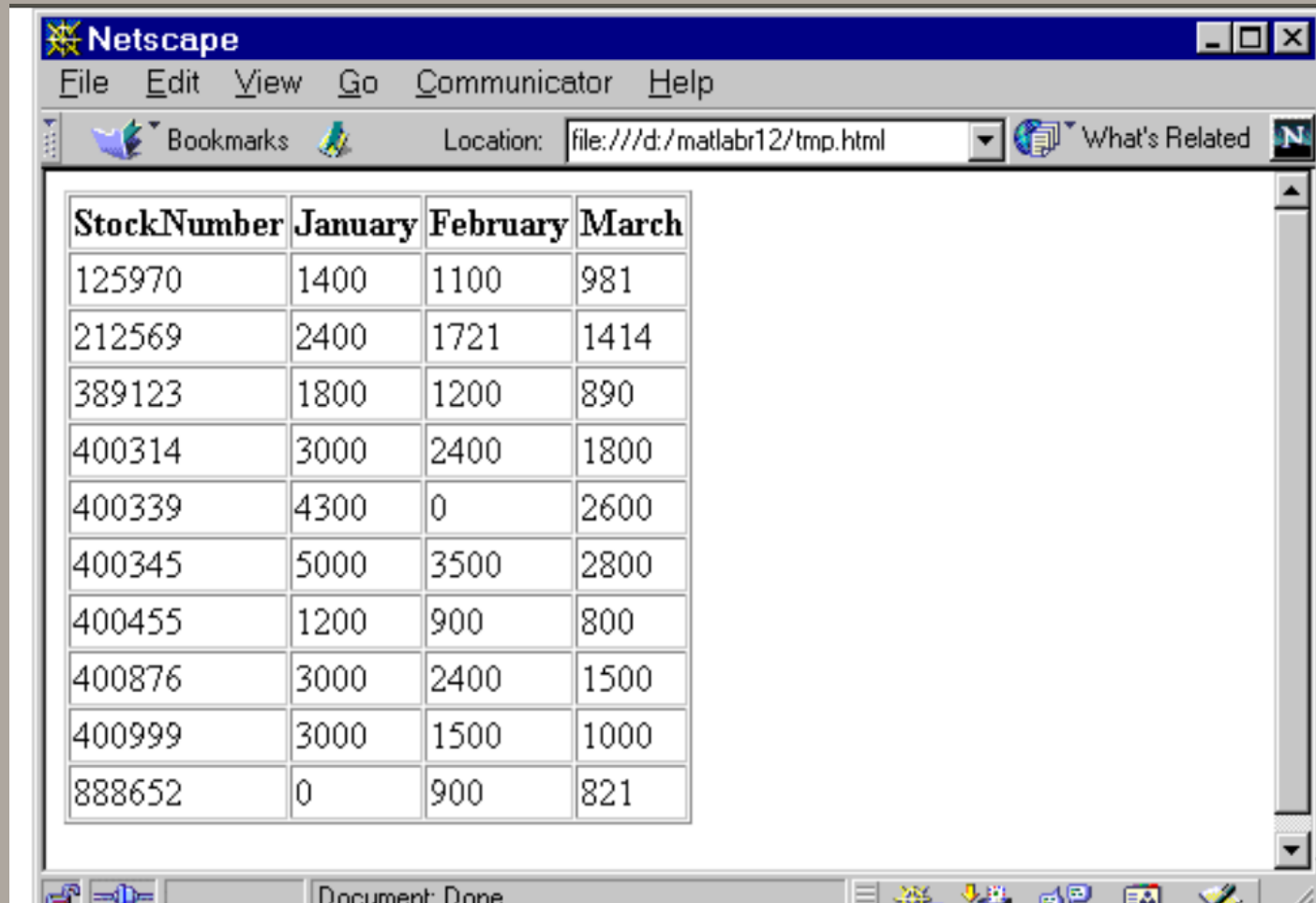
After executing a query, select Chart from the Display menu. The Charting dialog box appears.



Viewing Query Results

- **3-Report Display of Results in a Table :**

The report display presents the results in your system's default Web browser.



The screenshot shows a Netscape web browser window. The title bar reads "Netscape". The menu bar includes "File", "Edit", "View", "Go", "Communicator", and "Help". The address bar shows "Location: file:///d:/matlabr12/tmp.html". The main content area displays a table with the following data:

StockNumber	January	February	March
125970	1400	1100	981
212569	2400	1721	1414
389123	1800	1200	890
400314	3000	2400	1800
400339	4300	0	2600
400345	5000	3500	2800
400455	1200	900	800
400876	3000	2400	1500
400999	3000	1500	1000
888652	0	900	821

The status bar at the bottom shows "Document: Done" and various icons.

