

IBM SPSS Data Collection Data Model 6 Installation Guide



Note: Before using this information and the product it supports, read the general information under Notices on p. 29.

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Preface

Welcome to the *IBM® SPSS® Data Collection Data Model 6 Installation Guide*. This guide provides information on installing the IBM® SPSS® Data Collection Data Model. For information about using the Data Model, refer to the *Data Model* section in the *IBM® SPSS® Data Collection Developer Library*.

Adobe Portable Document Format (.pdf) versions of the guides are available on the *Data Model* CD-ROM. Viewing and printing the documents requires Adobe Reader. If necessary, you can download it at no cost from www.adobe.com. Use the Adobe Reader online Help for answers to your questions regarding viewing and navigating the documents.

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IBM SPSS Data Collection Data Model 6 installation instructions

Before you start

Before you install IBM® SPSS® Data Collection Data Model, read these installation instructions.

What you need to run IBM SPSS Data Collection Data Model

The minimum hardware and software requirements for IBM® SPSS® Data Collection Data Model are as follows:

Operating systems

- Microsoft® Windows® XP Professional (x86 32-bit edition) with Service Pack 3, Microsoft Windows XP Tablet PC Edition 2005 (x86 32-bit edition) with Service Pack 2, Microsoft Windows Vista Business or Enterprise Edition (x86 32-bit or x64 64-bit edition), or Microsoft Windows 7 Professional or Enterprise Edition (x86 32-bit or x64 64-bit edition).

Software

For Microsoft XP Systems:

- Microsoft .NET Framework 3.5 SP1 (available from the [Microsoft download site](http://www.microsoft.com/downloads/details.aspx?familyid=ab99342f-5d1a-413d-8319-81da479ab0d7&display=details) (<http://www.microsoft.com/downloads/details.aspx?familyid=ab99342f-5d1a-413d-8319-81da479ab0d7&display=details>))
- Microsoft Internet Explorer 6.0 or 7.0
- Microsoft Data Access Components 2.8 or later (included with the Data Model installation). The installation automatically installs the English language version, but if you are running a different language version of Windows you need to install the appropriate language version.

For Microsoft Vista or 7 Systems:

- Microsoft .NET Framework 3.5 SP1
- Microsoft Internet Explorer 7.0

Hardware

- Pentium®-class processor operating at 800MHz or faster.
- 512MB RAM
- A hard disk with at least 50MB of available disk space.

- CD-ROM drive required for installation.

Documentation for IBM SPSS Data Collection Data Model

The documentation for IBM® SPSS® Data Collection Data Model is provided in the IBM® SPSS® Data Collection Developer Library, (DDL) which is available on the Data Model installation CD as a separate installation. It is also available as a free download from <http://www.spss.com>.

For more information, see the topic [Installing the IBM SPSS Data Collection Developer Library](#) on p. 4.

Required software checklist

IBM® SPSS® Data Collection Data Model requires the following software in order to run.

Automatic installation

The Data Model installation procedure checks for the following software and installs it if it is not already installed.

- [Microsoft Data Access Components 2.8 \(English language version\)](#)
- Microsoft XML Core Services 4.0

Download and install separately

The following required software must be downloaded and installed separately before Data Model can be installed.

- [Internet Explorer 6.0 or above](#)
- [Microsoft .NET Framework 3.5 SP1](#)

Installing Microsoft .NET Framework 3.5 SP1

Before you can install IBM® SPSS® Data Collection Data Model 6 on a Windows XP system, you need to install Microsoft .NET Framework 3.5 SP1. If you attempt to install when Microsoft .NET Framework 3.5 SP1 is not installed, the installation program will display a message explaining that you need to install Microsoft .NET Framework 3.5 SP1 it before you can proceed with the Data Model 6 installation.

Note: Installing Microsoft .NET Framework 3.5 SP1 upgrades a number of Windows components.

Installing Microsoft .NET Framework 3.5 SP1

- ▶ Download and install Microsoft .NET Framework 3.5 SP1 from the [Microsoft download site](http://www.microsoft.com/downloads/details.aspx?familyid=ab99342f-5d1a-413d-8319-81da479ab0d7&displaylan) (<http://www.microsoft.com/downloads/details.aspx?familyid=ab99342f-5d1a-413d-8319-81da479ab0d7&displaylan>)
- ▶ Follow the instructions on the screen.

- ▶ Restart your computer. This is recommended even if the installation program does not request it.

Installing Internet Explorer 6.0 or above

Before you can install IBM® SPSS® Data Collection Data Model, you need Internet Explorer 6.0 or above to be installed on your computer.

Internet Explorer is available in many languages from
<http://www.microsoft.com/windows/ie/downloads/default.aspx>.

Microsoft Data Access Components 2.8

The IBM® SPSS® Data Collection Data Model installation automatically installs the English language version of Microsoft Data Access Components (MDAC) 2.8. If you are running a different language version of Windows, you need to install the appropriate language version, which is available on the Data Model CD-ROM.

For more information on MDAC 2.8, see
<http://www.microsoft.com/Windows/downloads/default.aspx>.

Installing IBM SPSS Data Collection Data Model 6

Important

- Before you can install IBM® SPSS® Data Collection Data Model 6 on a Windows XP system, you need to install Microsoft .NET Framework 3.5 SP1. If you attempt to install when Microsoft .NET Framework 3.5 SP1 is not installed, the installation program will display a message explaining that you need to install it before you can proceed with the installation. For more information, see the topic [Installing Microsoft .NET Framework 3.5 SP1](#) on p. 2.
- Before you can install IBM® SPSS® Data Collection Data Model, you need Microsoft Internet Explorer 6.0 or above to be installed on your computer. For more information, see the topic [Installing Internet Explorer 6.0 or above](#) on p. 3.

Manually starting the installation program

The Windows AutoPlay feature should detect and start the installation program when you insert the Data Model 6 installation CD into the CD-ROM drive. If this does not happen, follow these steps to manually start the installation program:

- ▶ Insert the Data Model 6 installation CD into the CD-ROM drive.
- ▶ From the Windows Start menu, choose Run.

- ▶ In the Run dialog box, type `d:\autoplay` where `d:\` is the CD-ROM drive.

This opens the Data Model 6 Installer window.

Installing IBM SPSS Data Collection Data Model 6

- ▶ From the Installer window, choose Install Data Model 6.
This starts the Data Model 6 Setup wizard.
- ▶ On the License Agreement page, read the license agreement.
- ▶ If you accept the agreement, click I accept the terms in the license agreement and click Next.

Installing the IBM SPSS Data Collection Developer Library

The documentation for IBM® SPSS® Data Collection Data Model is provided in the IBM® SPSS® Data Collection Developer Library, (DDL) which is available on the Data Model installation CD as a separate installation. It is also available as a free download from <http://www.spss.com>.

The Data Collection Developer Library (DDL) is a collection of tools for developing your own applications and for modifying existing IBM® SPSS® Data Collection products. The documentation that comes with the DDL provides a host of valuable technical information about how the Data Collection products work. It includes sections about Data Model.

The IBM® SPSS® Data Collection Interviewer Server Administration section includes the following topics.

- Security.
- Interviewer Server Administration and IBM® SPSS® Data Collection Survey Tabulation load balancing.
- Wizards and the Interviewer Server Administration Application Framework for building your own Interviewer Server Administration applications.
- Distributed Property Management (DPM) and DPM Explorer.
- File management.
- Files that control how Interviewer Server Administration works.
- Object models.

The IBM® SPSS® Data Collection Interviewer Server section includes the following topics.

- The function of and interaction between Interviewer Server components.
- Procedures for starting and stopping interviews, time-outs, and activation.
- Database tables.
- Log files.
- Sample Management.
- The Project Cache.

- The Image Cache.
- Interview Engine load balancing.
- Object models.

You may find it useful when installing Data Model because it contains sample data sets that users can use while learning Data Model, as well as step-by-step instructions for installing these data sets.

Data Model users may also like to have the *Data Collection Developer Library* available to them as it provides technical information about Data Model and the Data Model that is not available in the Data Model Help.

Installing the IBM SPSS Data Collection Developer Library

- ▶ Verify you meet all system requirements. See [System requirements](#) and [Samples and tools](#).
- ▶ From the Data Model Installer window, choose Install Data Collection Developer Library. Follow the instructions on each screen.

Notes

- The DDL is available as a separate installation on all Data Collection product installation CDs.
- To view the DDL Release Notes, browse the CD and open *Release Notes.htm* from the DDL folder. You can also view the Release Notes after installation in the DDL installation directory (*[INSTALL_FOLDER]\IBM\SPSS\DataCollection\6\DDL\Release Notes.htm*).
- If you have installed an earlier version of the DDL, it is recommended that you remove it before installing the new version.
- You may experience missing help topics when the Data Collection Developer Library is installed after the Data Collection applications are installed. You can restore the missing topics by manually deleting the IBM Eclipse Help System's cache files:
 1. Navigate to the Windows Control Panel > Administrative Tools > Services and stop the *DataCollectionHelpCenterService* service.
 2. Go to *C:\Program Files\Common Files\IBM\SPSS\DataCollection\6\Documentation\ibm_help\eclipse* and delete the *workspace* directory.
 3. Open the *configuration* directory and delete the four child directories (*org.eclipse.core.runtime*, *org.eclipse.equinox.app*, *org.eclipse.osgi*, and *org.eclipse.update*). Take care that you DO NOT delete the file *config.ini*.
 4. Restart the *DataCollectionHelpCenterService* service. All of the help system topics should now display as expected.
- If you do not have Visual C++ 6.0 installed, the installation program will not install the Visual C++ CDSC wizard. However, this will not affect the rest of your installation. If you subsequently install Visual C++ 6.0, you can install the Visual C++ CDSC wizard by modifying your DDL installation via Add/Remove Programs in the Control Panel.

System requirements

Operating systems

- A 32-bit version of Microsoft® Windows® XP Professional with Service Pack 2, a 32-bit or 64-bit version of Microsoft Windows Vista Ultimate Edition, or 32-bit version of Windows Server™ 2003 Standard or Enterprise Edition with Service Pack 2

Software

- Microsoft Internet Explorer 6.0 or above
- A program for extracting files from a ZIP archive

Hardware

- Pentium-class processor operating at 90 MHz or faster
- 64 MB RAM minimum
- A hard disk with at least 150 MB available space, plus an additional 150 MB if installing the optional browser-based version of the DDL documentation
- CD-ROM drive required for installation
- A graphics adapter with 1024 x 768 resolution or higher
- Minimum 16-bit color quality setting

Samples and tools

If installing the IBM® SPSS® Data Collection Developer Library (DDL), refer to the following information to take full advantage of the DDL. You can install the DDL by clicking Install Data Collection Developer Library from the Autoplay menu.

The DDL includes a number of samples and tools. All of these require IBM® SPSS® Data Collection Data Model 6, and some have additional requirements:

- Three C# wizards that can be used with Visual Studio .NET to simplify the creation of an IBM® SPSS® Data Collection Interviewer Server Administration activity. The wizards require installation of IBM® SPSS® Data Collection Interviewer Server 6 or IBM® SPSS® Data Collection Survey Tabulation 6.
- A Visual C++ wizard that simplifies the creation of a case data source component (CDSC). This requires installation of Visual C++ 6.0 with Service Pack 4 or later.
- The Visual C++ source code for the XML CDSC. To compile this source code, you must have Microsoft Visual C++ 6.0 with Service Pack 4 or later, Microsoft Data Access Components (MDAC) 2.8 or later, and Microsoft Windows Template Library from the Microsoft Platform SDK.
- The Visual Basic source code for the following tools and applications: a skeleton Visual Basic CDSC project, an example Visual Basic CDSC, a CDSC test tool, DM Query, DSC Explorer, IBM® SPSS® Data Collection Metadata Model Explorer, and a tool for creating aliases in an MDM document. These require Visual Basic 6.0. Executable files are provided for DM Query and Metadata Model Explorer so you can use them even if you do not have Visual Basic.

- The source code and executable files for three Visual Basic .NET applications: DM Query, WinDMSRun, and DPM Explorer.NET. To run the WinDMSRun executable file, you need IBM® SPSS® Data Collection Base Professional 6, and to run DPM Explorer.NET, you need Interviewer Server 6 or Survey Tabulation 6. To compile the source code, you need these products and Visual Basic .NET.
- Numerous sample DataManagementScript (DMS) files. To run these files, you must install Base Professional 6.
- Numerous sample mrScriptBasic files. To run these files, you must have Data Model 6. Some of these samples have additional requirements, such as Microsoft Office, Base Professional 6, or IBM® SPSS® Data Collection Author Professional 6.
- A number of sample mrScriptMetadata files. To use these files, you must have Data Model 6.
- The Short Drinks sample comes in the form of an SQL Server backup of a relational MR (RDB) database. You need SQL Server Client Tools to restore and use this database.

Removing IBM SPSS Data Collection Data Model

Important

To remove IBM® SPSS® Data Collection Data Model, you should use the Windows uninstall feature. If you simply delete the files and folders associated with the product, the program is not properly removed and you may have problems installing or removing later versions.

Note that if you have any other products that use Data Model on your computer, Data Model will not be removed from your computer until the last product that uses it is uninstalled. However, it is not necessary to uninstall any products before upgrading to a new version of the Data Model.

Removing IBM SPSS Data Collection Data Model

- ▶ Log on as the user that you used for installing Data Model, or as any user in the administrators group.
- ▶ Open Control Panel and choose Add/Remove Programs.
- ▶ Choose IBM® SPSS® Data Collection Data Model
- ▶ Click Add/Remove or Change/Remove.
This starts the Data Collection Data Model Setup wizard.
- ▶ On the Welcome page, choose Remove and then click Next.
- ▶ Confirm your request when prompted to do so.
- ▶ On the Maintenance Complete page, click Finish.
- ▶ Restart your computer when prompted to do so. If you do not restart you will not be able to re-install Data Model.

IBM SPSS Data Collection JDBC Driver guide

The IBM® SPSS® Data Collection JDBC Driver allows you to read Data Collection case data in applications that support Java Database Connectivity (JDBC). The Data Collection JDBC Driver contains the following components:

- **JDBC Service Driver.** This component is only available for Windows platforms. The service driver provides a bridge between the JDBC client and the Data Collection IBM® SPSS® Data Collection Data Model component. The service driver handles data requests from the service client driver, and can be installed on the same computer or on one or more remote computers. This allows you to configure one service driver that can be used by many clients. The service driver can reduce network traffic when your case data is located on the same computer where the service driver is installed (all queries occur on the same server). Only the resulting cases are sent to the service client. There may also be performance improvements when the server has a faster processor or more RAM than the service client machines.
- **Client Service Driver.** This component is available for Windows, UNIX, and Linux operating systems. The service client driver provides an interface between the client application, that needs to read the Data Collection case data, and the service driver that handles the data request.

IBM SPSS Data Collection JDBC Driver system requirements

The minimum system requirements for the IBM® SPSS® Data Collection JDBC Driver are:

JDBC Service Driver

- Microsoft® Windows® XP Professional (x86 32-bit edition) with Service Pack 3, Microsoft Windows Server 2003 or 2008 Standard or Enterprise Edition (x86 32-bit or x64 64-bit edition) with Service Pack 2, Microsoft Windows Vista Business or Enterprise Edition (x86 32-bit or x64 64-bit edition), or Microsoft Windows 7 Professional or Enterprise Edition (32-bit or x64 64-bit edition)
- Approximately 100MB of available hard disk space.
- Data Collection IBM® SPSS® Data Collection Data Model 6 must be installed prior to installing the JDBC service driver.

Client Service Driver

Windows

- Microsoft® Windows® XP Professional (x86 32-bit edition) with Service Pack 3, Microsoft Windows Server 2003 or 2008 Standard or Enterprise Edition (x86 32-bit or x64 64-bit edition) with Service Pack 2, Microsoft Windows Vista Business or Enterprise Edition (x86 32-bit or x64 64-bit edition), or Microsoft Windows 7 Professional or Enterprise Edition (32-bit or x64 64-bit edition)

Linux

- Linux®

Sun Solaris

- Sun Solaris 9 (2.9) (32-bit or 64-bit SPARC), Sun Solaris 10 (32-bit or 64-bit SPARC)

HP-UX

- HP-UX 11 (64-bit Itanium)

AIX

- AIX®

J2SE 1.4.2 (or higher)

- Must be installed prior to installing the Client service driver.

Installation instructions***Installing the JDBC service driver***

1. Navigate to the *\JDBC Driver\Server* directory on the IBM® SPSS® Data Collection Data Model installation CD.
2. Double-click the file *IBM SPSS Data Collection JDBC Service Driver.exe*.
3. This starts the IBM® SPSS® Data Collection JDBC Service Driver Setup wizard. Click Next.
4. The License Agreement page displays the software license agreement. If you accept the agreement, click I accept the terms in the license agreement. Click Next to continue.
5. The Service Configuration page displays the system port number that the JDBC service driver will use. Enter an appropriate port number, or keep the default setting of **19999**, and click Next.

Important: You must change the default setting if port 19999 is in use by another application.

6. The Destination Folder page displays the path where the JDBC service driver will be installed. You can change the path or keep the default location. Click Next to continue.
7. The Ready to Install the Program page displays the selected installation options. Click Next to begin the installation.
8. After the installation is complete, click Finish.

Note: The JDBC service driver requires the file *mrOledb.dll* to retrieve data from Data Collection applications. It is recommended that you install the Data Collection IBM® SPSS® Data Collection Data Model 6 before installing the driver.

Uninstalling the JDBC service driver

1. Open the Windows Control Panel and double-click the Add or Remove Programs icon.
2. Select Data Collection JDBC Service Driver, and click Remove.
3. Click Yes on the Add or Remove programs warning popup.

Installing the client service driver

1. Navigate to the `\JDBC Driver\Client` directory on the installation CD.
 - **PHjc.jar** - the driver JAR file that is used directly in Java applications. The driver class is: `com.spss.datacollection.jdbc.openaccess.OpenAccessDriver`
 - **dcjcininstall.package** - the installation package for IBM® SPSS® Collaboration and Deployment Services Package Manager. You can install the driver as a IBM SPSS Collaboration and Deployment Services component.

Installing the client service driver for BIRT Report Designer for IBM SPSS

1. Navigate to the `\JDBC Driver\Client` directory on the Data Model installation CD.
2. Double-click the file *IBM SPSS Data Collection JDBC Client Service Driver for BIRT Report Designer.exe*. This starts the Client Service Driver for BIRT Report Designer for IBM® SPSS® Setup wizard. Click Next to continue.
3. The License Agreement step displays the software license agreement. Select I accept the terms in the license agreement and click Next to continue.
4. The Destination Folder step displays the path where the client service driver will be installed. By default, this path is the default BIRT Report Designer for IBM SPSS 4.0 installation directory. If BIRT Report Designer for IBM SPSS is installed in another directory, or the version is not 4.0, change this path to match the correct BIRT Report Designer for IBM SPSS path. Click Next to continue.
5. Click Next on the Ready to Install the Program step to begin the installation.
6. click Finish. After the installation is complete.

Connection string

There are a number of connection properties that need to be specified when you access data using the JDBC Driver. When you access data using the IBM® SPSS® Data Collection products, this is generally invisible, because the products automatically set up all of the connection properties for you. However, when you use the JDBC Driver to access data, the connection properties need to be defined.

```
<connection-string> ::= jdbc:paswdatacollection://<hostname>:<port>; CustomProperties=(<properties>
<properties> ::= <property>; | <property>; <properties>
<property> ::= <property-keyword> = ["<property-value>"]
<property-keyword> ::= <identifier>
<property-value> ::= character-string
```

Example

```
jdbc:paswdatacollection://dc-server:19999;CustomProperties=(Data Source=mrXmlDsc;Location=household.xml;
Initial Catalog=[INSTALL_FOLDER]\IBM\SPSS\DataCollection\6\DDL\Data\XML\household.mdd)
```


Refer to the *Connection Properties* and *Connecting to the IBM® SPSS® Data Collection Data Model* topics in the IBM® SPSS® Data Collection Developer Library for more information regarding connection properties.

Standard connection properties

Property Name	Description	Data Type
Connect Timeout	The length of time, in seconds, to wait for the initialization to complete. (not required)	A 32-bit, signed integer.
Data Source	The CDSC name to be used with the connection. This is the component name of the CDSC <i>ProgID</i> (for example, <i>mrRdbDsc</i>). The JDBC driver can automatically select the CDSC. (not required)	String
Initial Catalog	The name or location of the metadata source. For file or directory-based data stores, this is the path to the file or directory. The provider will treat a relative path as being relative to the metadata file specified in the Initial Catalog property. If Initial Catalog is not set, the provider will treat a relative path as being relative to the current directory. The provider resolves a relative path to an absolute path before passing it to the CDSC. For OLE DB-based data stores, this is the OLE DB connection string. See the <i>Connecting to a Relational MR Database</i> topic in the Data Collection Developer Library for more information. (required)	String
Location	The name or location of the data source. For file or directory-based data stores, this is the path to the file or directory. (not required)	String
Mode	This is used internally to filter the CDSCs in the Data Link Properties dialog box (for example, so that only read-enabled CDSCs are listed when the Mode setting is read). Other uses of this property are reserved for future use. (not required)	String
Password	The password to connect to the data source. This property should not be a blank string. (required)	String
User ID	The user ID to connect to the data source. The user ID should have the appropriate authority to logon to the workstation where the service driver is installed. (required)	String

Note: Connection string property values cannot include parenthesis characters ().

Updating the JDBC Service Driver to support custom connection property prefixes

By default, custom connection properties that are prefixed by *MR* or *MR Init* are not supported in the connection string. If you want to specify these custom connection properties they must be manually declared in the JDBC Service Driver's configuration:

1. After installing the JDBC Service Driver, go to the Windows Control Panel > Administrative Tools > Services.
2. In the Services list, locate and select the service DataCollectionJDBCDriverService.

3. Select Stop from the Action menu.
4. Navigate to the \cfg directory in the JDBC Service Driver installation path (default path is: [INSTALL_FOLDER]\IBM\SPSS\DataCollection\6\JDBC Server).
5. Open the file *oadm.ini* with a text editor (Notepad for example).
6. Search for the keyword *DataSourceIPCustomProperties*; the default value is:

```
User ID=;Password=;Data Source=;Initial Catalog=;Location=;Mode=Read;Connect Timeout=;
```
7. Append the appropriate property name at the end of the value. For example, if you want to add the property MR Init Category Names, the value should be written as:

```
User ID=;Password=;Data Source=;Initial Catalog=;Location=;Mode=Read;Connect Timeout=;MR Init Category Names=;
```
8. Save the *oadm.ini* file.
9. Go back to the Services dialog.
10. In the Services list, locate and select the service DataCollectionJDBCService.
11. Select Start from the Action menu and close the Services dialog.

IBM SPSS Data Collection JDBC Driver specification

The section outlines the IBM® SPSS® Data Collection JDBC Driver specification, and is composed of the following topics:

- [SQL syntax](#)
- [Database metadata](#)
- [IBM SPSS Data Collection data types](#)
- [Query from VDATA](#)
- [Query from HDATA](#)
- [Return category value](#)
- [Return level field](#)

SQL syntax

Tables

The IBM® SPSS® Data Collection JDBC Driver supports the VDATA, HDATA and SYS.* tables.

VDATA and HDATA are supported by the Data Collection OLE DB provider. After a query, the JDBC driver returns a standard JDBC result set (the JDBC driver converts results returned by the Data Collection OLE DB provider into a JDBC result set). The transformation can result in multiple tables being returned. Refer to [Query from VDATA](#) and [Query from HDATA](#) for more information.

- **VDATA** – a single, flat table that contains a column for each variable that can be presented in a flattened form.
- **HDATA** – a set of hierarchical tables (the top-level table is called HDATA). Each lower-level table represents the data in a loop or grid.

Refer to the *Virtual Tables* topic in the IBM® SPSS® Data Collection Developer Library for more information.

SQL Syntax

The JDBC driver works in pass-through mode. Refer to the *SQL Queries* section in the Data Collection Developer Library for more detailed information regarding SQL query statements. The section provides topics for the following:

- Basic SQL Queries
- Advanced SQL Queries
- Hierarchical SQL Queries
- Advanced Hierarchical SQL Queries

Expression Evaluation

The Data Collection Evaluate component implements expression parsing and evaluation. The component is used by the Case Data Model (CDM), the Metadata Model (MDM), and the mrScript engine. The Evaluate component supports standard expression grammar. The parser is unique, however, in its support for categorical variables and its optional support for single or double-quoted string literals. Expression evaluation is documented in detail in the *Expression Evaluation* section in the Data Collection Developer Library. The section provides links to the following topics:

- **Operator Precedence.** Describes the order in which operators are evaluated when there are multiple operators in an expression.
- **Arithmetic Operators.** Describes the behavior of the addition (+), subtraction (-), multiplication (*), division (/), and modulus (Mod) arithmetic operators on Data Model variables of various types.
- **Categorical Set Logic.** Summarizes the set operations for categorical variables.
- **Comparison Operators.** Describes the behavior of the equal to (=), not equal to (<>), less than (<), less than or equal to (<=), greater than (>), and greater than or equal to (>=) comparison operators on Data Model variables of various types.
- **Categorical Comparison Operators.** Summarizes how comparison operators work with categorical variables.
- **Like Operator.** Describes the Like operator, which is a special comparison operator that can be used to compare two text values.
- **Logical Operators.** Describes the And, Or, Xor, and Not logical operators.

- **Complex Expressions.** Provides some examples of using more than one operator in an expression.
- **Null Values.** Describes how the Evaluate component handles NULL values.

IBM SPSS Data Collection Function Library

The Data Collection Function Library supplements basic expression evaluation with more advanced operations. The Function Library is documented in detail in the *Data Collection Function Library* section in the Data Collection Developer Library.

The functions are divided into the following groups:

- **Categorical Functions.** Functions that operate on categorical data only.
- **Text, Categorical, or Array Functions.** Functions that operate on text or categorical data, or arrays.
- **Text Functions.** Functions that operate on text data only.
- **Date and Time Functions.** Functions that operate on date and time data only.
- **Conversion Functions.** Functions that convert data from one data type to another.
- **Random Number Functions.** Functions for generating random numbers.
- **List Functions.** Functions for ordering, and retrieving items from, category lists, arrays, and collections of objects.
- **Mathematical Functions.** A number of mathematical functions.
- **Miscellaneous Functions.** Functions that do not apply to any of the other groups.

Aggregate functions

The Case Data Model provides support for a number of aggregate functions. These functions can be used in SQL queries to summarize information from multiple rows. Supported aggregate functions are shown in the following table.

Aggregate Function	Description
AVG(expr)	Returns the average of the values defined in the expression. This function can be used with numeric data only.
BASE(expr)	Returns the total number of cases included in the expression. Generally, the base includes every case for which the value is not NULL. However, if the <code>IsInBase</code> attribute has been set to True, the case is included in the base regardless of the value. Conversely, if the <code>IsInBase</code> attribute has been set to False, the case is excluded from the base regardless of the value.
COUNT(expr)	Returns a count of the cases in a column.
SUM(expr)	When used with numeric data, returns the sum of the values. When used with categorical data, it returns the union of the categorical values.
MIN(expr)	Returns the lowest value defined in the expression.

Aggregate Function	Description
MAX(expr)	Returns the highest value defined in the expression.
STDEV(expr)	Returns the standard deviation of the values defined in the expression. This function can be used with numeric data only. The standard deviation is a measure of dispersion around the mean. In a normal distribution, 68% of cases fall within one standard deviation of the mean and 95% of cases fall within 2 standard deviations. For example, if the mean age is 45 with a standard deviation of 10, then 95% of the cases would be between 25 and 65 in a normal distribution.

Database metadata

The IBM® SPSS® Data Collection JDBC driver supports the following metadata:

getColumnns

Retrieves a description of table columns available in the specified catalog. Only column descriptions matching the catalog, schema, table and column name criteria are returned. The results are ordered by TABLE_CAT, TABLE_SCHEM, TABLE_NAME, and ORDINAL_POSITION.

```
ResultSet getColumnns(String catalog,
    String schemaPattern,
    String tableNamePattern,
    String columnNamePattern)
    throws SQLException
```

The JDBC driver ignores all parameters and returns all columns. The driver returns all fields in VDATA, HDATA, array objects, and grid objects. The field name can be used in SQL.

getSchemas

Retrieves the available database schema names. The results are ordered by TABLE_CATALOG and TABLE_SCHEM.

```
ResultSet getSchemas()
    throws SQLException
```

getTables

Retrieves a description of the tables available in the given catalog. Only table descriptions matching the catalog, schema, table name, and type criteria are returned. The results ordered by TABLE_TYPE, TABLE_CAT, TABLE_SCHEM, and TABLE_NAME.

```
ResultSet getTables(String catalog,
    String schemaPattern,
    String tableNamePattern,
    String[] types)
    throws SQLException
```

The JDBC driver ignores all parameters and returns all tables.

getTypeInfo

Retrieves a description of all the supported database data types. The results are ordered by DATA_TYPE and then by how closely the data type maps to the corresponding JDBC SQL type.

If the database supports SQL distinct types, then `getTypeInfo()` will return a single row with a TYPE_NAME of DISTINCT and a DATA_TYPE of TYPES.DISTINCT. If the database supports SQL structured types, then `getTypeInfo()` returns a single row with a TYPE_NAME of STRUCT and a DATA_TYPE of Types.STRUCT. If SQL distinct or structured types are supported, then information on the individual types can be obtained from the `getUDTs()` method.

Data Collection TYPE_NAME	Data Collection Data Type	JDBC Metadata DATA_TYPE	JDBC Metadata TYPE_NAME	Java Class
DOUBLE	5	8	double	java.lang.Double
LONG	3	4	integer	java.lang.Integer
DATE	7	93	timestamp	java.sql.Timestamp
BOOLEAN	11	-7	boolean	java.lang.Boolean
TEXT	130	-1	longvarchar	java.lang.String
CATEGORICAL	129	12	varchar	java.lang.String
OBJECT	128	Ignore		
LEVEL	136	-2	BINARY	byte[]

IBM SPSS Data Collection data types

Refer to the sections in the IBM® SPSS® Data Collection Developer Library for more information:

- Data Types
- MDM Document Structure
- Variable Type Overview

Query from VDATA

When querying data from VDATA, the JDBC driver converts data from the IBM® SPSS® Data Collection OLE DB provider to the JAVA result set using the following rules:

Data Collection Data Type	Description	JAVA Result Set
Double	A 64-bit floating-point number with at least 15 digits of precision.	A single column: Double
Long	A 32-bit signed integer.	A single column: Integer

Data Collection Data Type	Description	JAVA Result Set
Text	A character string. The maximum length of a text variable is dependent on the DSC. The string may or may not support Unicode, depending on how the CDSC has implemented its storage. The Provider implements all strings using Unicode.	A single column: String
Categorical	A single or multiple categorical response type. The maximum number of responses available varies between DSCs. A categorical response is implemented in the Provider as a string. The responses are formatted within curly braces, ({, }), with each response delimited by a comma. For example, {2,3,8} represents the responses 2, 3, and 8. Depending on how the data was collected, the order of responses in the string can be the order in which they were chosen in response to the question. This can be important for analysis.	Column.Type is Categorical 129. The type is returned as a <code>getTypeInfo</code> method of <code>DatabaseMetadata</code> . The return value is determined by the connection properties. For more information, see the topic Return category value on p. 24.
Date	A 64-bit OLE date. The OLE date type contains both date and time and it is represented using the DATE type.	A single column: DATE
Object	Not implemented.	N/A
Boolean	A Boolean value of either True or False. This is implemented internally using <code>VARIANT_BOOL</code> . However, when a Boolean is converted to a Long or a Double, it will be converted to 1 for True and 0 for False.	A single column: Boolean
Level	A hierarchical value. A level contains a child recordset.	N/A for VDATA; a single BINARY column for HDATA
Array	Also called a Loop. These represent loops, grids, and levels. The Array object defines a question or set of questions that are to be asked more than once.	Multiple columns. Refer to the <i>Query Array field in VDATA</i> or <i>Query Array field in HDATA</i> section for more information.
Class	These represent a grid question. A Grid object can be considered a special case of the Array object.	Multiple columns. Refer to the <i>Query Class field in VDATA</i> or <i>Query Class field in HDATA</i> section for more information.

Data Collection Data Type	Description	JAVA Result Set
Compound	These group categorical and grid questions that share a category list, typically for presentation in a paper questionnaire.	Multiple columns. Refer to the <i>Query Compound field in VDATA</i> or <i>Query Compound field in HDATA</i> section for more information.
Grid	These are used to group questions.	Multiple columns. Refer to the <i>Query Grid field in VDATA</i> or <i>Query Grid field in HDATA</i> section for more information.

Query array field in VDATA

If an array is unbound, it is not possible to query data from VDATA, but it is possible to query flattened data from HDATA. You cannot query an array field such as `SELECT person FROM VDATA`. You can however query sub-fields in an array field because although array fields are not columns in VDATA, sub-fields are treated as columns. If the array field is a bound array, the result set is converted into multiple columns, such as:

`ArrayField[M].subfield, ArrayField[M+1].subfield, ..., ArrayField[N].subfield`

M is the lower-bound value and N is upper-bound value.

Example

In the following example (based on data from the IBM® SPSS® Data Collection Developer Library *household.mdd* example), the *person* field is an array that includes the *age* sub-field. The *person* field is bound from 1 to 6. To query the *age* field data, the query statement would be:

```
SELECT person[1].age
, person[2].age
, person[3].age
, person[4].age
, person[5].age
, person[6].age
FROM VDATA
```

The result data is:

person[1].age	person[2].age	person[3].age	person[4].age	person[5].age	person[6].age
25	(null)	(null)	(null)	(null)	(null)
45	43	15	12	(null)	(null)
72	81	(null)	(null)	(null)	(null)
32	9	2	(null)	(null)	(null)
29	31	(null)	(null)	(null)	(null)
63	(null)	(null)	(null)	(null)	(null)
38	39	8	7	4	(null)
25	23	26	(null)	(null)	(null)
42	7	(null)	(null)	(null)	(null)

Query class field in VDATA

A class field is a block of sub-fields. You cannot query a class field such as `SELECT Respondent FROM VDATA`. You can however query sub-fields in a class field because although class fields are not columns in VDATA, sub-fields are treated as columns.

Example

In the following example (based on data from the Data Collection Developer Library *museum.mdd* example), the *Respondent* field is a class that includes the *Serial* and *Origin* sub-fields. The *person* field is bound from 1 to 6. To query the *Serial* and *Origin* field data, the query statement would be:

```
SELECT Respondent.Serial
, Respondent.Origin
FROM VDATA
```

The result data is:

Respondent.Serial	Respondent.Origin
1	(null)
2	(null)
3	(null)

Query grid field in VDATA

You cannot query a grid field such as `SELECT rating FROM VDATA`. You can however query sub-fields in a grid field because although grid fields are not columns in VDATA, sub-fields are treated as columns. There are typically three kinds of grids: single response grids, multiple responses grids, and numeric grids.

Single response grids and multiple responses grids

You can use `gridName[{elementName}].gridSubField` to obtain a sub-field's value. Refer to [Return category value](#) for more information returning categorical values in JDBC.

Example

In the following example (based on data from the Data Collection Developer Library *museum.mdd* example), *rating* is a multiple response grid:

```
SELECT
rating[{Dinosaurs}].Column
, rating[{Conservation}].Column
, rating[{Fish_and_reptiles}].Column
FROM VDATA
```

The result data is:

rating[{{Dinosaurs}}].Column	rating[{{Conservation}}].Column	rating[{{Fish_and_reptiles}}].Column
{52}	{51}	{52}
{51}	{}	{50}
{48}	{}	{51}
{51}	{51}	{51}

Numeric grids

You can use `gridName [{{elementName}}].numericName` to obtain a sub-field's value.

Example

Using data from the Data Collection Developer Library *short_drinks.mdd* example:

```
SELECT
numdrksz[{{TEA}}].mond
, numdrksz[{{COFFEE}}].mond
, numdrksz[{{TEA}}].tuesd
, numdrksz[{{COFFEE}}].tuesd
FROM VDATA
```

The result data is:

numdrksz[{{TEA}}].mond	numdrksz[{{COFFEE}}].mond	numdrksz[{{TEA}}].tuesd	numdrksz[{{COFFEE}}].tuesd
5	2	4	3
3	4	3	3
6	0	6	0
0	3	0	2

Query compound field in VDATA

A compound field is a class that includes multiple grid fields. All grids share a same set of categorical elements that are stored in the compound field. You cannot query a compound field such as `SELECT plans FROM VDATA`. Compound fields are not columns in VDATA.

You can use `compoundName.gridName[{{elementName}}].gridSubFieldName` to obtain a sub field's value.

Summary

VDATA is a flat view; all columns can be obtained via the `getColumns` method. The negative aspects of using VDATA are:

- Bound array fields and grid fields are presented in expanded mode.
- You cannot query unbound array data.

Query from HDATA

When you query data from HDATA, the IBM® SPSS® Data Collection JDBC Driver converts data from the Data Collection OLE DB Provider to the JAVA result set using the following rules:

Data Collection Data Type	Description	JAVA Result Set
Double	A 64-bit floating-point number with at least 15 digits of precision.	A single column: Double
Long	A 32-bit signed integer.	A single column: Integer
Text	A character string. The maximum length of a text variable is dependent on the DSC. The string may or may not support Unicode, depending on how the CDSC has implemented its storage. The Provider implements all strings using Unicode.	A single column: String
Categorical	A single or multiple categorical response type. The maximum number of responses available varies between DSCs. A categorical response is implemented in the Provider as a string. The responses are formatted within curly braces, ({, }), with each response delimited by a comma. For example, {2,3,8} represents the responses 2, 3, and 8. Depending on how the data was collected, the order of responses in the string can be the order in which they were chosen in response to the question. This can be important for analysis.	Column.Type is Categorical 129. The type is returned as a <code>getTypeInfo</code> method of <code>DatabaseMetadata</code> . The return value is determined by the connection properties. For more information, see the topic Return category value on p. 24.
Date	A 64-bit OLE date. The OLE date type contains both date and time and it is represented using the DATE type.	A single column: DATE
Object	Not implemented.	N/A
Boolean	A Boolean value of either True or False. This is implemented internally using <code>VARIANT_BOOL</code> . However, when a Boolean is converted to a Long or a Double, it will be converted to 1 for True and 0 for False.	A single column: Boolean
Level	A hierarchical value. A level contains a child recordset.	N/A for VDATA; a single BINARY column for HDATA
Array	Also called a Loop. These represent loops, grids, and levels. The Array object defines a question or set of questions that are to be asked more than once.	Multiple columns. Refer to the <i>Query Array field in VDATA</i> or <i>Query Array field in HDATA</i> section for more information.

Data Collection Data Type	Description	JAVA Result Set
Class	These represent a grid question. A Grid object can be considered a special case of the Array object.	Multiple columns. Refer to the <i>Query Class field in VDATA</i> or <i>Query Class field in HDATA</i> section for more information.
Compound	These group categorical and grid questions that share a category list, typically for presentation in a paper questionnaire.	Multiple columns. Refer to the <i>Query Compound field in VDATA</i> or <i>Query Compound field in HDATA</i> section for more information.
Grid	These are used to group questions.	Multiple columns. Refer to the <i>Query Grid field in VDATA</i> or <i>Query Grid field in HDATA</i> section for more information.

Query array field in HDATA

In HDATA, array fields are considered level. Querying a level field is same as querying all sub-fields of the level field. For more information, see the topic [Return level field](#) on p. 25.

You can query array object sub-fields from the array table. Refer to the example below for more information.

Array objects contain the specialty field `LevelID`, which is a sequential number in the current level.

Example

Using data from the IBM® SPSS® Data Collection Developer Library *household.mdd* example:

```
SELECT
  ^.housetype
  , ^.address
  , levelid
  , age
  , person
FROM HDATA.person
```

The result data is:

^.housetype	^.address	levelid	age	person
{59}	15B Park Avenue, Harrogate, HG1 4TY	1	25	1
{61}	46 Freedom Lane, Brighton, BN2 3YT	1	45	2
{61}	46 Freedom Lane, Brighton, BN2 3YT	2	43	3
{61}	46 Freedom Lane, Brighton, BN2 3YT	3	15	4
{61}	46 Freedom Lane, Brighton, BN2 3YT	4	12	5
{60}	The Meadows, Clifton Heights, BS34 3EG	1	72	6
{60}	The Meadows, Clifton Heights, BS34 3EG	2	81	7
{62}	23 Steep Hill, Norfolk, CB64 5TY	1	32	8
{62}	23 Steep Hill, Norfolk, CB64 5TY	2	9	9

^.housetype	^.address	levelid	age	person
{62}	23 Steep Hill, Norfolk, CB64 5TY	3	2	10
{61}		1	29	11
{61}		2	31	12
...

Query grid field in HDATA

In HDATA, grid fields are considered level. Querying a level field is same as querying all sub-fields of the level field. For more information, see the topic [Return level field](#) on p. 25.

You can query grid object sub-fields from the array table. Refer to the examples below for more information.

Grid objects contain the specialty field LevelID, which is an element value of the current grid.

Single response grids and multiple responses grids

Refer to the topic [Return category value](#) for information on returning categorical values in JDBC.

Example

Using data from the Data Collection Developer Library *museum.mdd* example:

```
SELECT
^.name
,levelid
,column
FROM HDATA.RATING
```

The result data is:

^.name	levelid	column
MyName	{31}	{52}
MyName	{32}	{}
MyName	{33}	{}
MyName	{34}	{}
MyName	{35}	{}
MyName	{36}	{}
MyName	{37}	{}
MyName	{38}	{51}
MyName	{39}	{52}
MyName	{40}	{}
MyName	{41}	{50}
MyName	{42}	{51}
MyName	{43}	{}
MyName	{44}	{51}
MyName	{45}	{}

^.name	levelid	column
MyName	{18}	{}

Numeric grids

Example

Using data from the Data Collection Developer Library *short_drinks.mdd* example:

```
SELECT
  Levelid
,mond
,tuesd
FROM HDATA.numdrksz
```

The result data is:

LevelID	mond	tuesd
{48}	5	4
{49}	2	3
{50}	0	0
{51}	0	0
{52}	0	1
{53}	0	0
{54}	0	0
{48}	3	3
{49}	4	3
{50}	0	0
{51}	0	0
{52}	0	0
{53}	0	0
{54}	0	0
...	...	

Return category value

Single Response Category

Return category as a string, such as {100}.

Multiple Response Category

Return category as a string, such as {100,102}.

Return level field

In HDATA, array fields and grids field are considered level (hierarchical table).

If the query statement is `SELECT * FROM HDATA`, the current level is HDATA. If the query statement is `SELECT * FROM HDATA.person`, the current level is HDATA.person.

In the IBM® SPSS® Data Collection OLE DB Provider, when querying fields are the same as the current level (or upper, then current level), the field's result should be considered as a normal field; otherwise querying fields are returned as a sub-table (level object).

Example: query content level fields and parent level fields

Using data from the IBM® SPSS® Data Collection Developer Library *household.mdd* example:

```
SELECT
  ^.housetype
, ^.address
, levelid
, age
, person
FROM HDATA.person
```

The result data is:

^.housetype	^.address	levelid	age	person
{59}	15B Park Avenue, Harrogate, HG1 4TY	1	25	1
{61}	46 Freedom Lane, Brighton, BN2 3YT	1	45	2
{61}	46 Freedom Lane, Brighton, BN2 3YT	2	43	3
{61}	46 Freedom Lane, Brighton, BN2 3YT	3	15	4
{61}	46 Freedom Lane, Brighton, BN2 3YT	4	12	5
{60}	The Meadows, Clifton Heights, BS34 3EG	1	72	6
{60}	The Meadows, Clifton Heights, BS34 3EG	2	81	7
{62}	23 Steep Hill, Norfolk, CB64 5TY	1	32	8
{62}	23 Steep Hill, Norfolk, CB64 5TY	2	9	9
{62}	23 Steep Hill, Norfolk, CB64 5TY	3	2	10
{61}		1	29	11
{61}		2	31	12
...

housetype	Address	levelid	age	person
{59}	15B Park Avenue, Harrogate, HG1 4TY	1	25	1
{61}	46 Freedom Lane, Brighton, BN2 3YT	1	45	2
		2	43	3
		3	15	4
		4	12	5
{60}	The Meadows, Clifton Heights, BS34 3EG	1	72	6
		2	81	7

housetype	Address	levelid	age	person
{62}	23 Steep Hill, Norfolk, CB64 5TY	1	32	8
		2	9	9
		3	2	10
{61}		1	29	11
		2	31	12
...

Return level object

Since the JDBC Driver only supports basic JDBC types, when the driver receives a level object from the Data Collection OLE DB Provider, the driver transports the level object as a binary array. At the Java client site, users are able to identify column values as a level of a sub-table by using the data type. If you want to place data inside a sub-table, you must query data directly from the table (for example, `SELECT * FROM HDATA.person`).

Troubleshooting

After installing the JDBC Service Driver, how can I verify that it is functioning properly? Is there a log that can help debug potential problems?

There is a Windows service named *DataCollectionJDBCService* that runs even when the Data Model is not installed on your machine. When problems occur, you can check the *DataCollectionJDBCService* service log in the Windows Event Viewer. You can access the Event Viewer from the Windows Control Panel:

Start > Control Panel > Administrative Tools > Event Viewer

What permissions are required to use the JDBC Client Driver?

The account referenced in the connection string should be a Windows user, and must have permission to log onto the JDBC Service Driver machine. Note that blank passwords are not accepted.

How can I convert category values, such as {25,26}, to readable strings via the JDBC Client Driver?

By default, the JDBC Client Driver returns category values for the type CATEGORICAL. You can use the method `FormatValue()` to convert the values to a label. For example, if you want to convert a column named `location` in an HDATA table, you can write a query such as:

```
SELECT FormatValue(location, location, 'b') from HDATA
```

Note that the first location in the above query is the variable name defined in the metadata and the second location is the column name in HDATA. Refer to the topic “FormatValue” in the *IBM® SPSS® Data Collection Developer Library* for more information.

How to obtain the category element label

Use the metadata mechanisms and, if required, use the *DefinedCategories* function. Metadata should be supplied via the standard JDBC metadata mechanism, not new SQL syntax. SQL syntax should be used as a pass-through to mrOleDB.

Example for multi-response categoricals

```
// Categorical string (unique values):
SELECT Museums FROM VDATA
```

```
// Categorical string (category names):
SELECT Museums.Format('a') FROM VDATA
```

```
// Categorical string (category labels):
SELECT Museums.Format('b') FROM VDATA
```

```
// Category set (unique values)
SELECT Museums.GetAnswer(0), Museums.GetAnswer(1), Museums.GetAnswer(2), Museums.GetAnswer(3), Museums.GetAnswer(4) FR
```

```
// Category set (category names)
SELECT Museums.GetAnswer(0).Format('a'), Museums.GetAnswer(1).Format('a'), Museums.GetAnswer(2).Format('a'), Museums.GetAns
```

```
// Dichotomy set
SELECT Museums.HasAnswer({national_museum_of_science}) As national_museum_of_science,
Museums.HasAnswer({museum_of_design}) As museum_of_design,
Museums.HasAnswer({institute_of_textiles_and_fashion}) As institute_of_textiles_and_fashion,
Museums.HasAnswer({archeological_museum}) As archeological_museum,
Museums.HasAnswer({national_art_gallery}) As national_art_gallery,
Museums.HasAnswer({northern_gallery}) As northern_gallery,
Museums.HasAnswer({other}) As other,
Museums.HasAnswer({not_answered }) As not_answered FROM VDATA
```

The labels for all elements can be returned from mrOleDB. For example: `SELECT Museums.DefinedCategories().Format('b') FROM VDATA`

Troubleshooting**Running a logged installation**

If you have problems during installation you cannot resolve, your SPSS Inc. Technical Support representative may request that you run a logged installation and send SPSS Inc. the log file. You should not need to do this under normal circumstances.

Running a logged installation

- ▶ Open a command prompt. For example, in Windows XP, click Start and go to All Programs > Accessories > Command Prompt

- ▶ At the command prompt, type the following:

```
IBM SPSS Data Collection Desktop 6.exe /s /v"/qn /l*v \"  
<location and name of log file>" installldir=\"C:\MyInstallFolder\" addlocal=All"
```

For example, the following command creates a file called *mylog.txt* in the *C:\temp* folder:

```
IBM SPSS Data Collection Desktop 6.exe /s /v"/qn /l*v \"C:\Temp\mylog.txt\"  
installldir=\"C:\MyInstallFolder\" addlocal=All"
```

- ▶ Follow the instructions for installing IBM® SPSS® Data Collection Data Model, but skip the first step. For more information, see the topic [Installing IBM SPSS Data Collection Data Model](#) 6 on p. 3.

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