Using the database connection

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Using the Database Connection, demo based webinar

1. Basic: Minimal startup
    1. Declare database table and connect
    2. Read from table and write to table
2. Intermediate: Row filtering
3. Intermediate: Instance selection
4. Intermediate: Making the connection flexible
    1. String parameters for connection and table
    2. Mapping column names to AIMMS identifiers
5. Advanced: leveraging database procedures
6. Advanced: Data Protected and environment query
    1. Create connection function
    2. Directly executing SQL commands
7. (No demo) Advanced: Querying environment

1. Database table for ProductDatabase

Database

AIMMS

Key column	Non key column

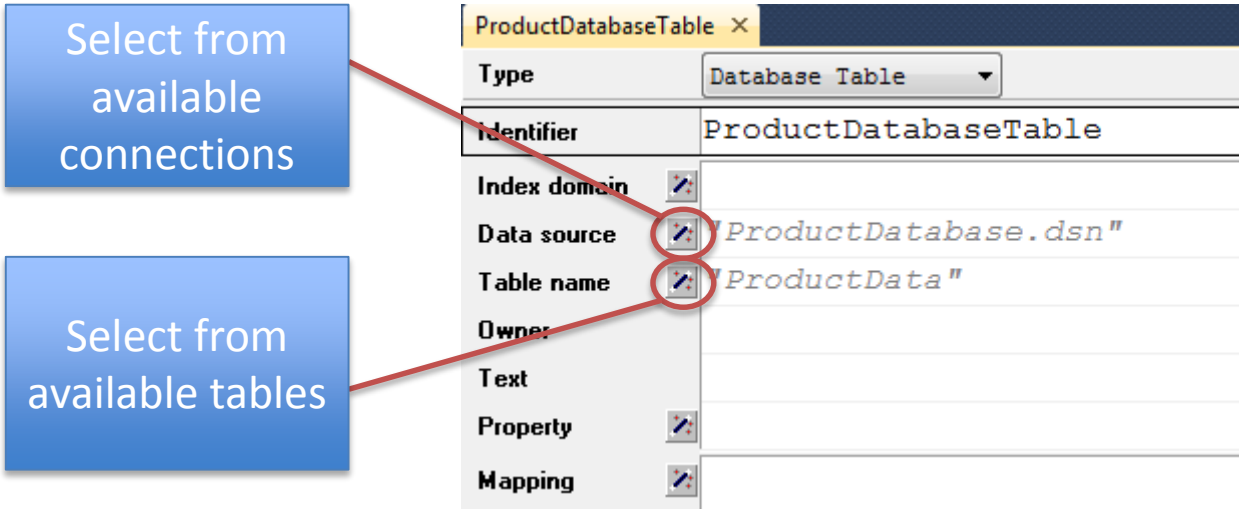
ProductData

ProductName	ExpectedDemand
Laptops	3
Radios	10
TVs	20
*	0

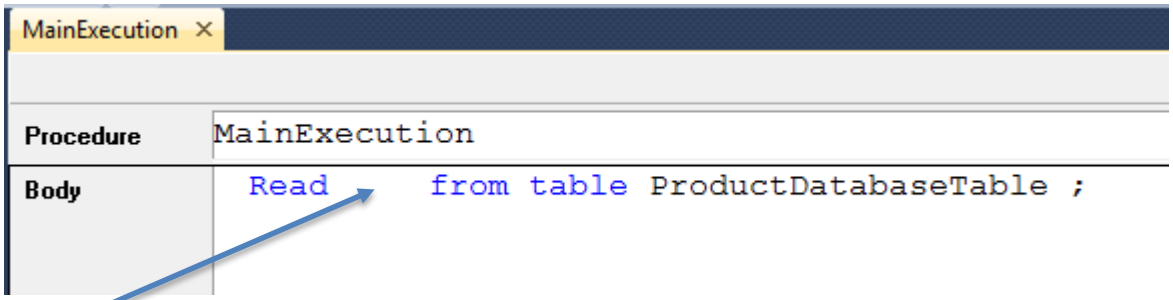
Set	Parameter

Summary demo 1:

- Create an AIMMS identifier of type database table and connect it:

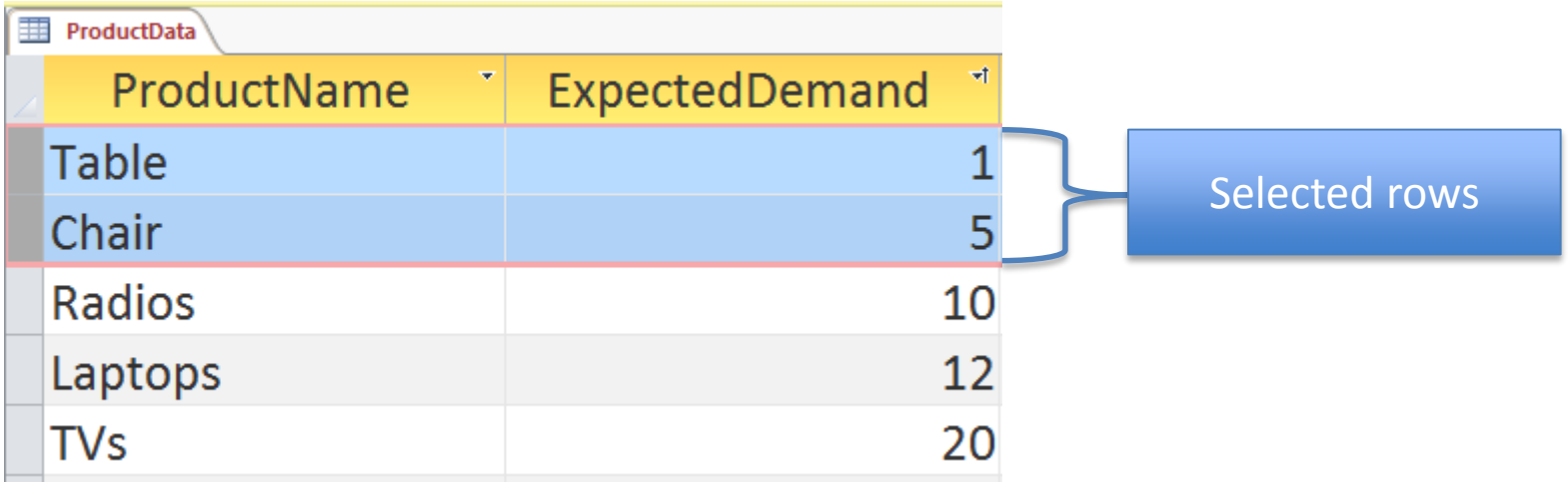


- Read from that table:



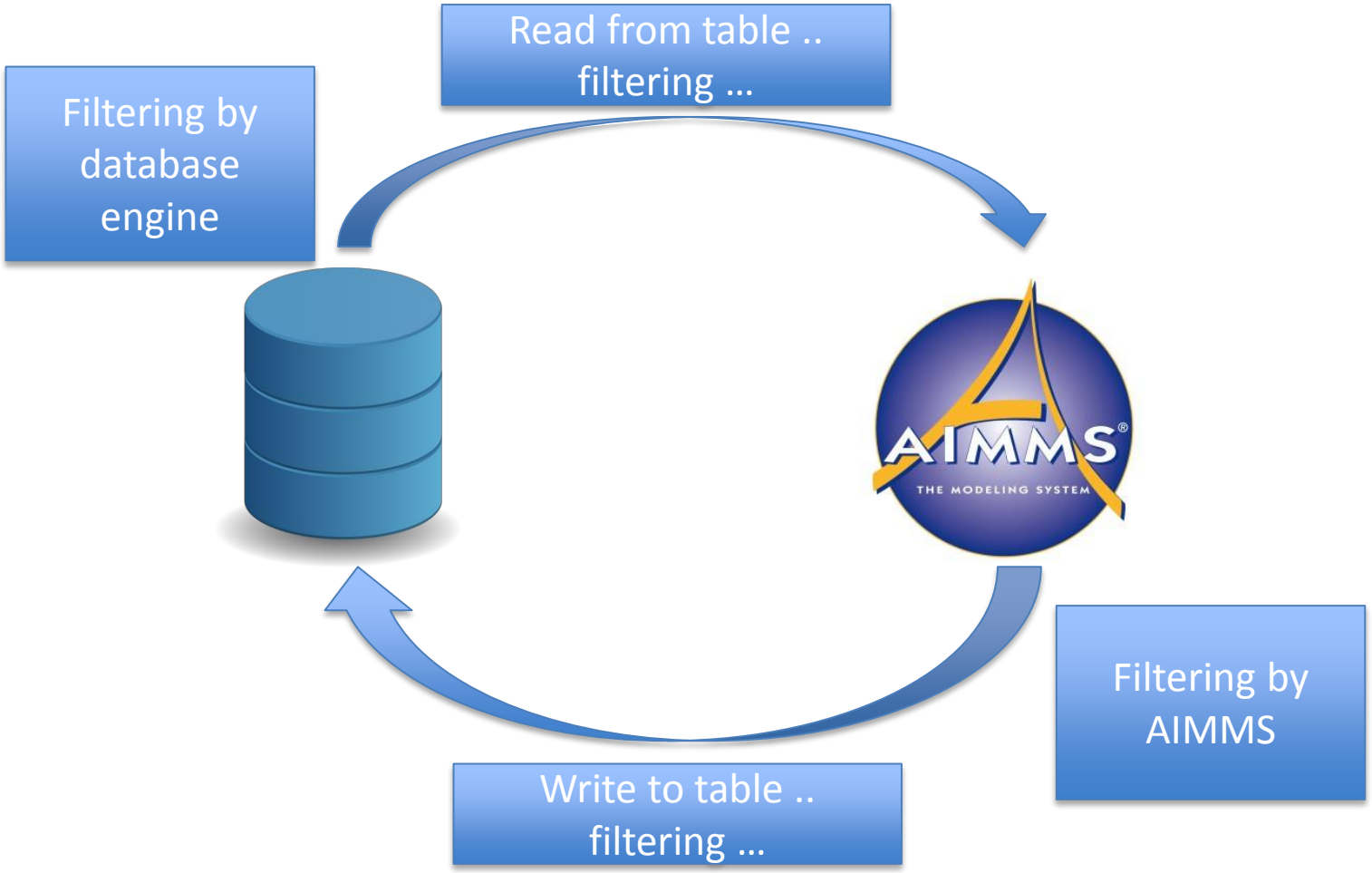
Column names are mapped to AIMMS identifiers with the same name

2. Intermediate: Row filtering




```
! Set ProductName = data { Table, Chair }
read from table ProductTable
    filtering ProductName ;
```

3. Filtering at origin: reduce communication overhead



3. Intermediate: Instance selection

ArchiveProductDatabaseTable

YearNumber	ProductName	ExpectedDemand
2008	Radios	10
2008	Laptops	12
2008	TVs	20
2014	Phones	70
2014	Laptops	50
2014	TVs	20

Obtain collection of instances:

```
Read YearNumber from Table ArchiveProductDatabaseTable ;
```

Select an instance:

```
e_YearNo := first( YearNumber );
```

Actually read that data instance:

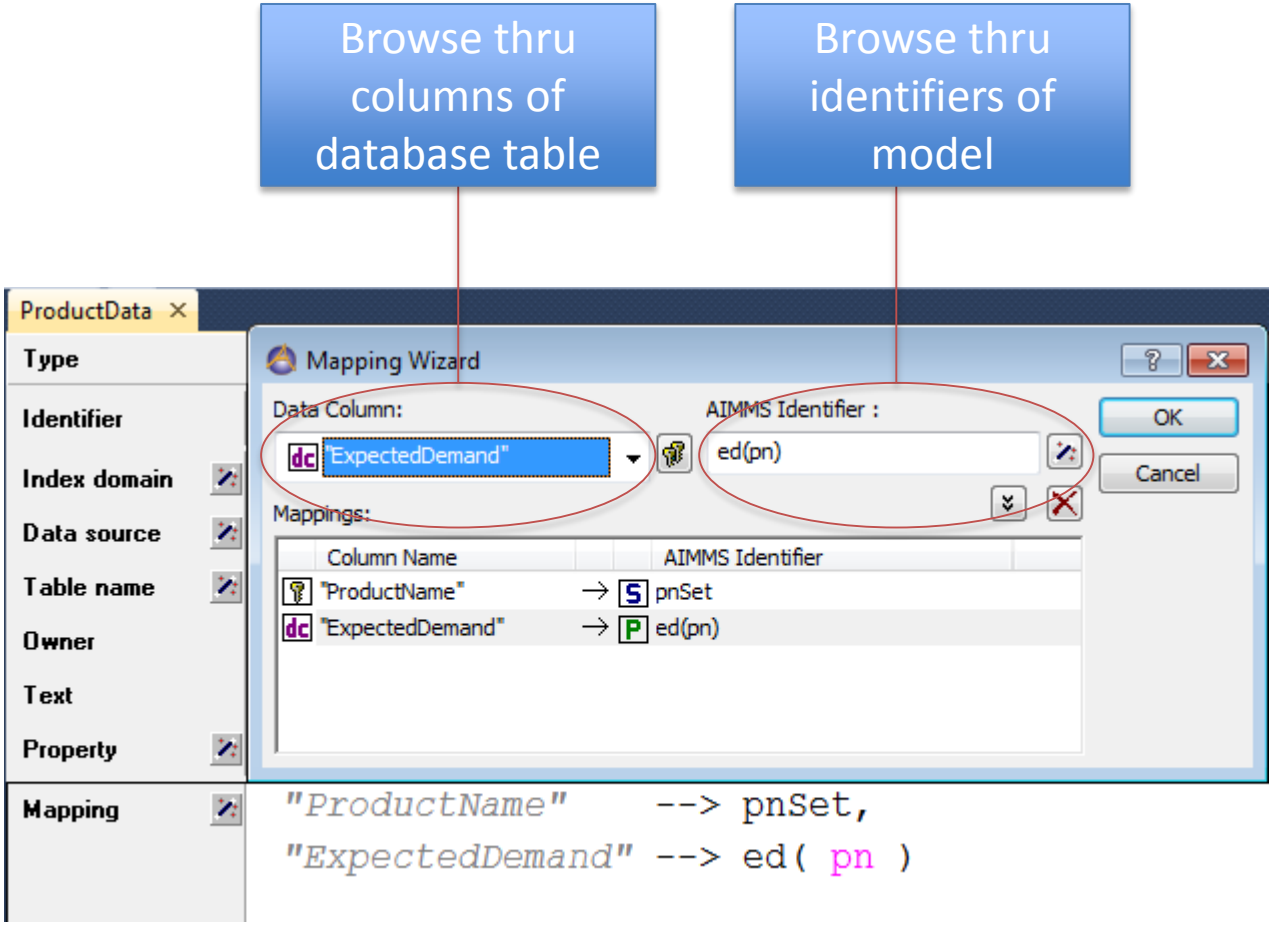
```
Read ExpectedDemand from
    Table IndexedArchiveProductDatabaseTable(e_YearNo);
```

4. Make connection flexible; use string parameters

- Use a string parameter to control the database selected; when the AIMMS app is installed at a different location, the database connection may have a different name as well.

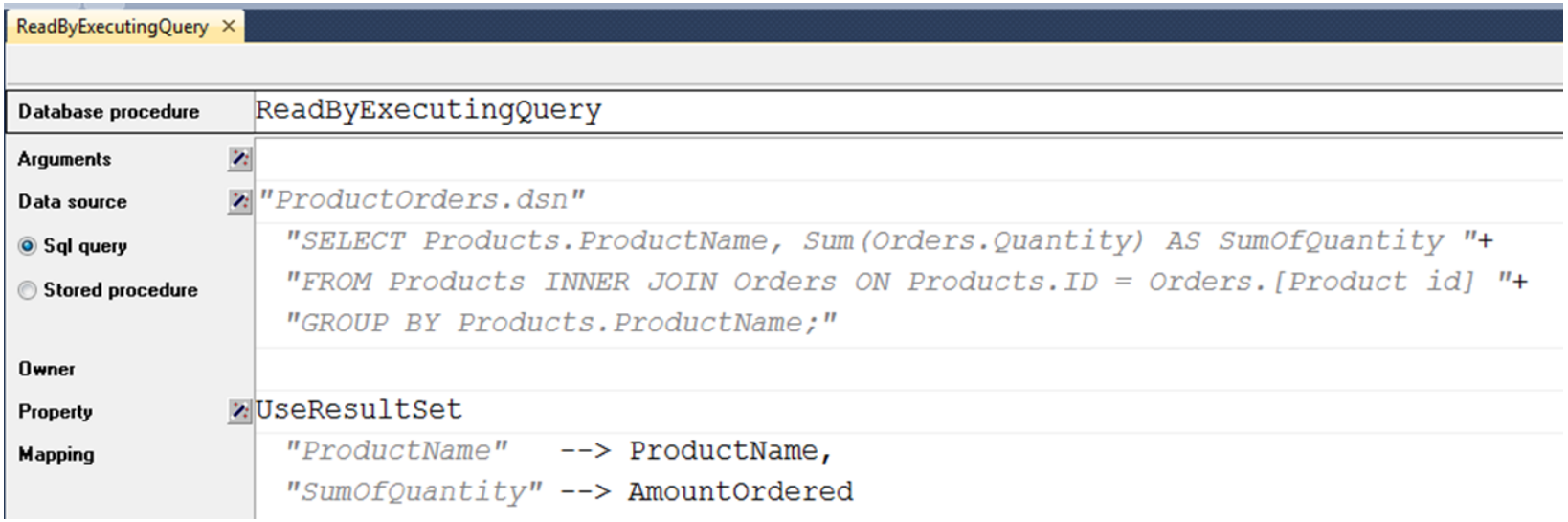
4. Intermediate: Making connection flexible

- Use a mapping attribute to map database columns to AIMMS identifiers. For instance, a space is allowed in a database column name, but not in the name of an AIMMS identifier.



5. Advanced: Leveraging database procedures

- The result set of SQL SELECT queries can be used to read data

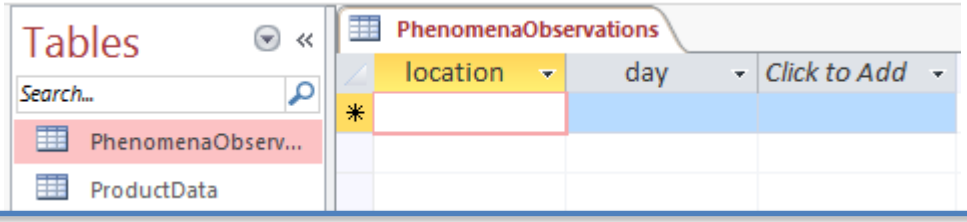


  - Set property `UseResultSet`
  - Use statement "`Read from table ReadByExecutingQuery`"

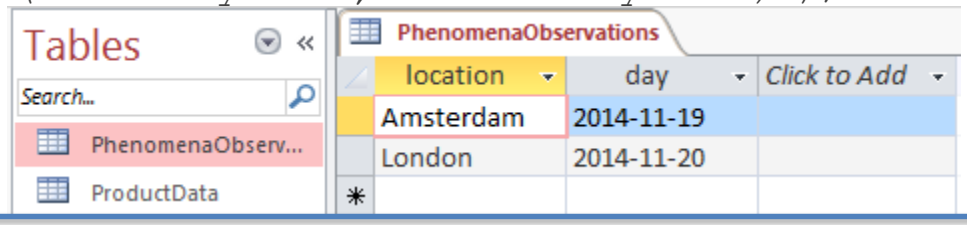
- Without result set, just call as any other procedure.

6. DirectSQL: Executing allowed SQL statements

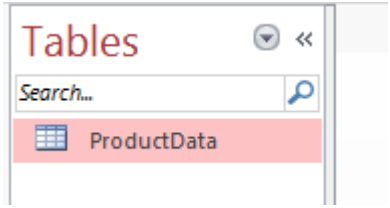
- `ok := DirectSQL( protected_connection_string, "CREATE TABLE PhenomenaObservations(location varchar(255), day varchar(255), PRIMARY KEY(location, day))" );`



- `ok := DirectSQL(protected_connection_string, "INSERT INTO PhenomenaObservations(location, day) VALUES ('" + city + "','" + someDay + "')");`



- `ok := DirectSQL( protected_connection_string, "DROP TABLE PhenomenaObservations" );`



No demo, advanced: Query environment

There are AIMMS intrinsic procedures to:

- Query number and name of drivers:

```
noDriverNames := SQLNumberOfDrivers('ODBC');
while LoopCount <= noDriverNames do
    DriverName := SQLDriverName('ODBC', LoopCount);
    SetElementAdd(DriverNames,eDriverName,DriverName);
endwhile;
```

- Query number and name of tables and views given a database connection

```
SQLNumberOfTables, SQLTableName, SQLNumberOfViews,
SQLViewName
```

- Query number and name, type of columns given a database table or view.

```
SQLNumberOfColumns, SQLColumnData
```

Related documentation:

- AIMMS Language reference:
  - Chapter 26: The READ and WRITE Statements
  - Chapter 27: Communicating With Databases

- AIMMS Function reference:
  - Chapter 16: Database Functions

- The tech blog of AIMMS:
  - http://techblog.aimms.com/2012/08/28/connect-to-access-database-file-via-odbc-connection-string/
  - http://techblog.aimms.com/2014/10/27/installing-32-bit-and-64-bit-microsoft-access-drivers-next-to-each-other/
  - http://techblog.aimms.com/2012/01/20/inspecting-sql-statements-created-by-aimms/

Announcement of next webinar

- The next webinar in this series, titled “Catch the errors with the AIMMS error hander”, will be presented by Haraldur Haraldsson, AIMMS Specialist.

Join us – December 17, 2014:

10 AM CET and

8AM PDT/11AM EDT

Questions?