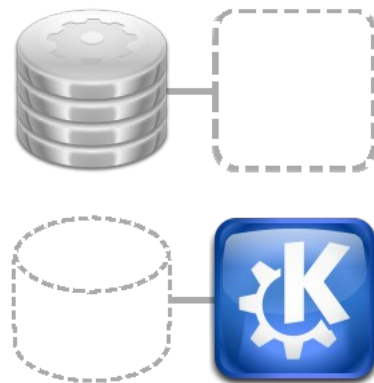




**Kexi - Data(base) Environment  
Universal Data Layer for KDE**



# **Kexi - Data(base) Environment Universal Data Layer for KDE**





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**Introducing the new codename:**

**Predicate**

**Target: KDE 4.1 or 4.2**



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## Overview

- **Problems to address**
- **Introduction to Predicate**
- **Predicate and KDE, Qt**
- **Kexi and Predicate plans**





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## Problems you can solve with Predicate

Opening document... Estimated time: 15 minutes.  
Please get some cafe or something...



- **Opening depends on document size even if you want to add one character**
- **Saving can take even longer**



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## **Predicate – what's in the box?**

- **SQLite, MySQL and PostgreSQL support**
- **Cost of data opening and saving - independent of total size (unlike the case with big XML files)**



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## **Database connectivity ...for human beings?**

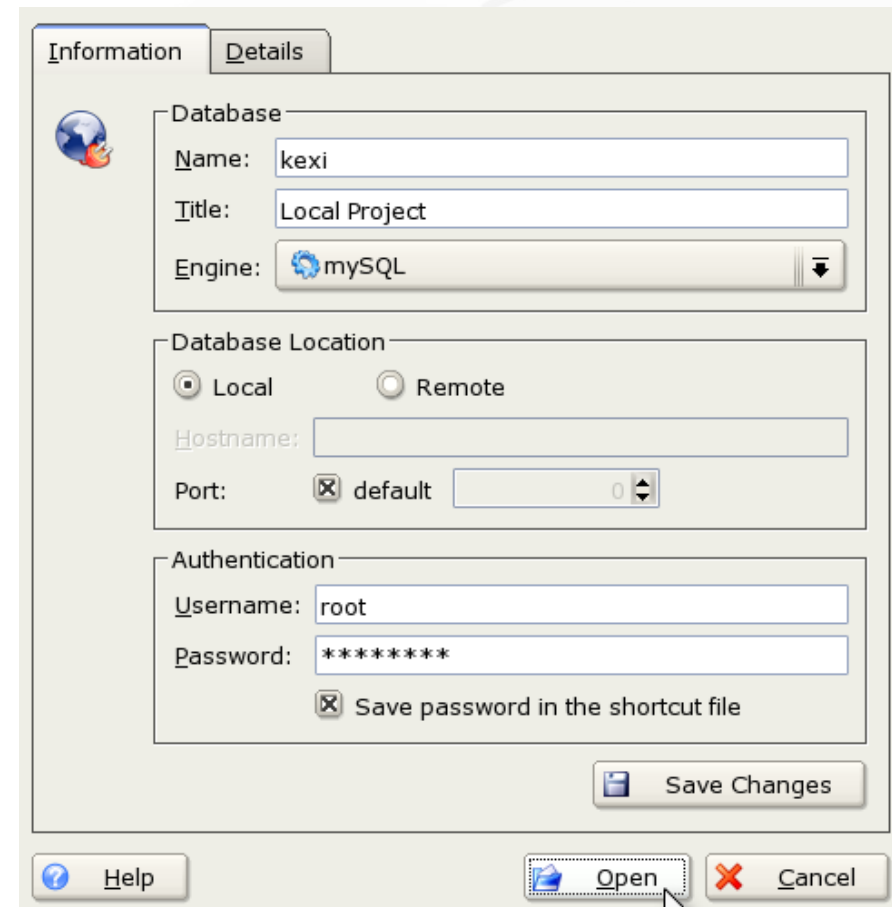
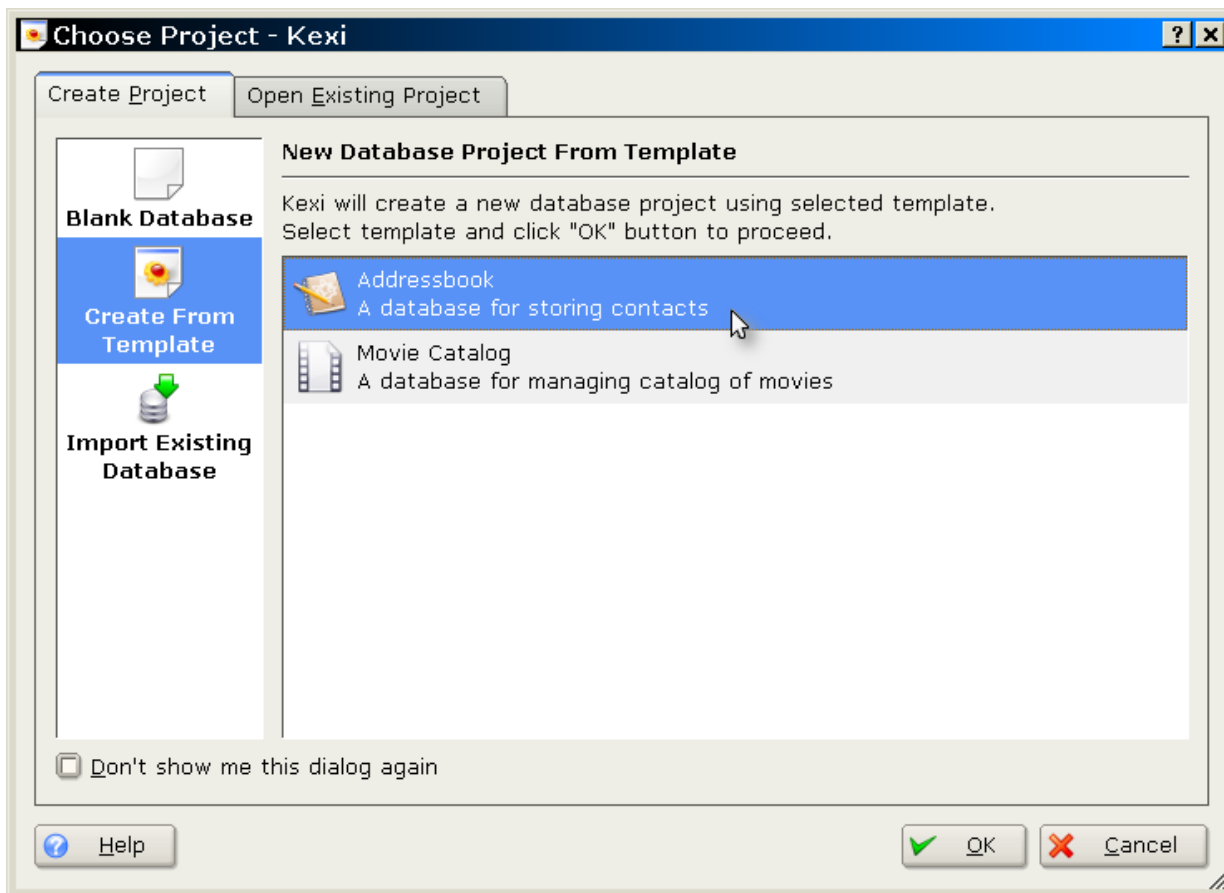
- It should take a minute to start working with new data...**



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## Startup assistants to the rescue





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## Unified database connection files

```
[Connection1]  
caption=Tunnel to the main server  
encryptedPassword=*****  
engine=mysql  
port=3333  
type=connection  
useLocalSocketFile=false  
user=test
```



- **Admin defines server connections**
- **Users refer to them by name from any app**

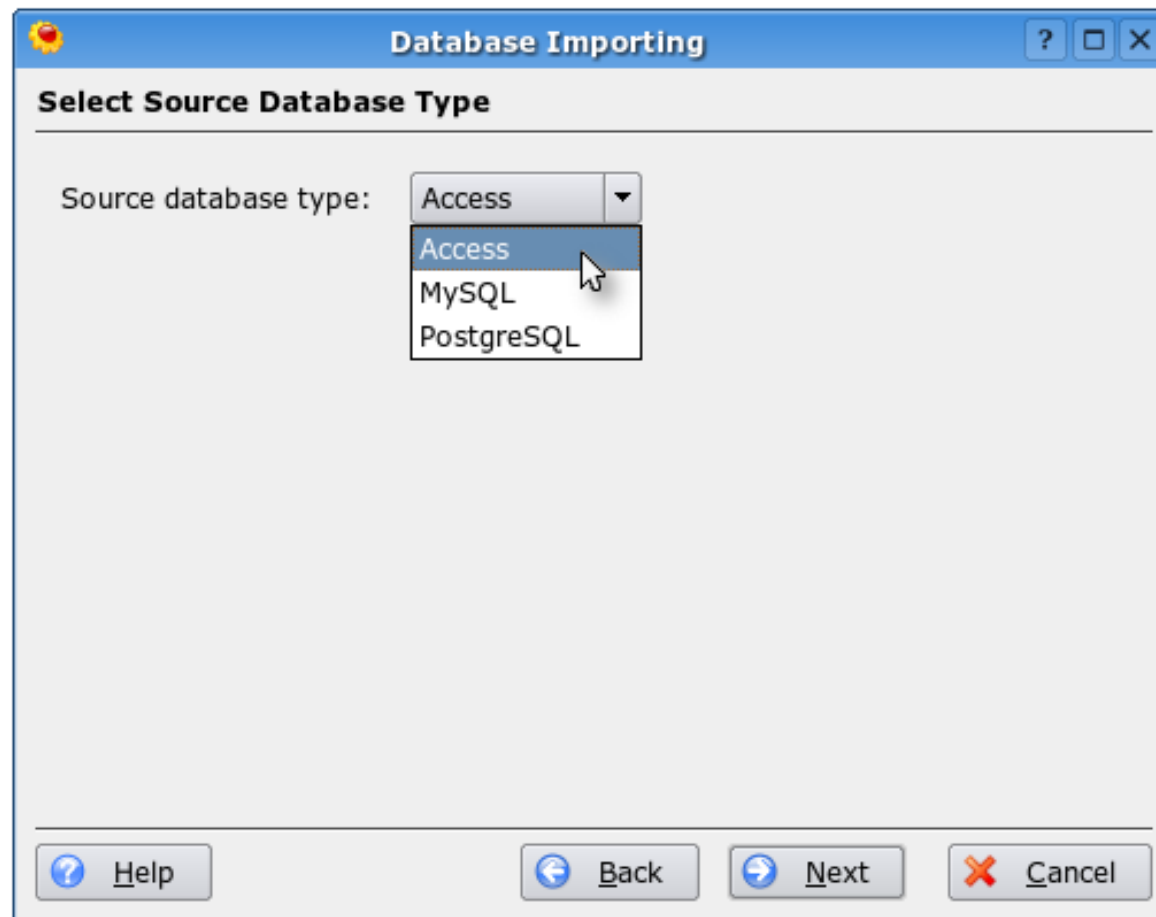




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## “Database import/export” assistants





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## **Database connectivity for ...human beings?**

- **Want more users?**

**Do not expect database  
administration skills.**





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## Problems you can solve with Predicate (2)

- **Don't export, don't import. Share.  
(If possible)**
- **Document files come from  
the pre-network and pre-Internet era**
- **Avoid creating multiple  
versions of the same document**





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## **Database connectivity for ...human beings?**

- **The solution: local database files with ability of migrating to a server**
- **Implementation: SQLite 3**



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*SQLite*

- **Self-contained C library acting as SQL server for application it links to**
- **Features:**
  - **Transactions**
  - **Fast, constant access time (binary format)**
  - **Command line interface**
  - **Widely adopted**



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*SQLite*

- **SQLite in KDE:**

- **Default Kexi (and thus, Predicate) database format**
- **Redland RDF's storage used by Soprano, which is used by NEPOMUK-KDE**
- **KDE PIM's Akonadi file-based storage**
- **Amarok's music collection**
- **Apps using QSql can already use SQLite**



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SQLite 

**in other software**

- **File format of Adobe Lightroom and Adobe Integrated Runtime**
- **Unified storage backend for Mozilla 2 components and extensions**
- **Included in Python, PHP and RealBasic**
- **Used by Google Desktop for the Mac**
- **Storage for AJAX apps in Google Gears**



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## **SQLite** **as system component in OS-es**

- **Part of Mac OS X 10.4 as embedded db engine; also used in Apple Mail and Aperture**
- **Integral part of Symbian 9.5**
- **Service Management Facility replacing /etc/inittab in Solaris 10**





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## **Can Predicate work for my app?**

- **Many applications are internally already database-like**
  - **especially those employing MVC design pattern**
- **There's no need to deal with database internals (SQL, backend specifics)**



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## **By the way: Predicate and KIO**

- **Predicate is like KIO interface  
but for database and data structures**



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KDE Interface:	KIO	Predicate
Data model	Hierarchical (tree/directed graph)	Relational, possible object-relational and hierarchical extensions
Basic concepts	inode (file/directory)	Record, column, table, relation
Relation between objects	one parent-many children/many-many (links)	record-in-table/view, relationships between records (graph)
Types and properties	File, directory (file types not handled at this level), file/directory attributes	Column type (simple data types)
Permissions	At file level, optionally for part of file	Up to individual cell, by controlling access to tables, records and columns
Namespaces	URI scheme name, mount points, elements of path	Data source/schema/table or view name/column name/alias
Generalized Family of abstracted	Anything supporting URI schemas: filesystem/URL-based network protocol (app. layer)/virtual filesystems	SQL databases/tabular data sources (CSV, XML)



## Predicate – what's in the box? (2)

- Tools for creating data models are available at API level – no need to hardcode SQL statements and implement GUI

```
t = new TableSchema("ownership");  
f = new Field("id", Integer);  
t->addField(f)  
f->setPrimaryKey(true);  
f = new Field("owner", Integer);  
t->addField(f);  
f = new Field("model", Integer);  
t->addField(f);  
f = new Field("since", Integer);  
t->setLookupFieldSchema("owner",
```

The screenshot shows the Kexi database tool interface. The top window displays the table schema for 'ownership' with columns: Id (Integer Number, primary key), Owner (Integer Number), Car (Integer Number), and Since (Integer Number). The 'Owner' field is selected, and a dropdown menu is open showing a list of names. The bottom window shows the data view for the 'ownership' table with the following data:

Id	Owner	Car	Since
1	Foster	Fiat	2004
2	Shelley	Syrena	1982
3	Gates™	Chrysler	2002
4	Smith	Volvo	2005
5	Пушкин	Volvo	2006

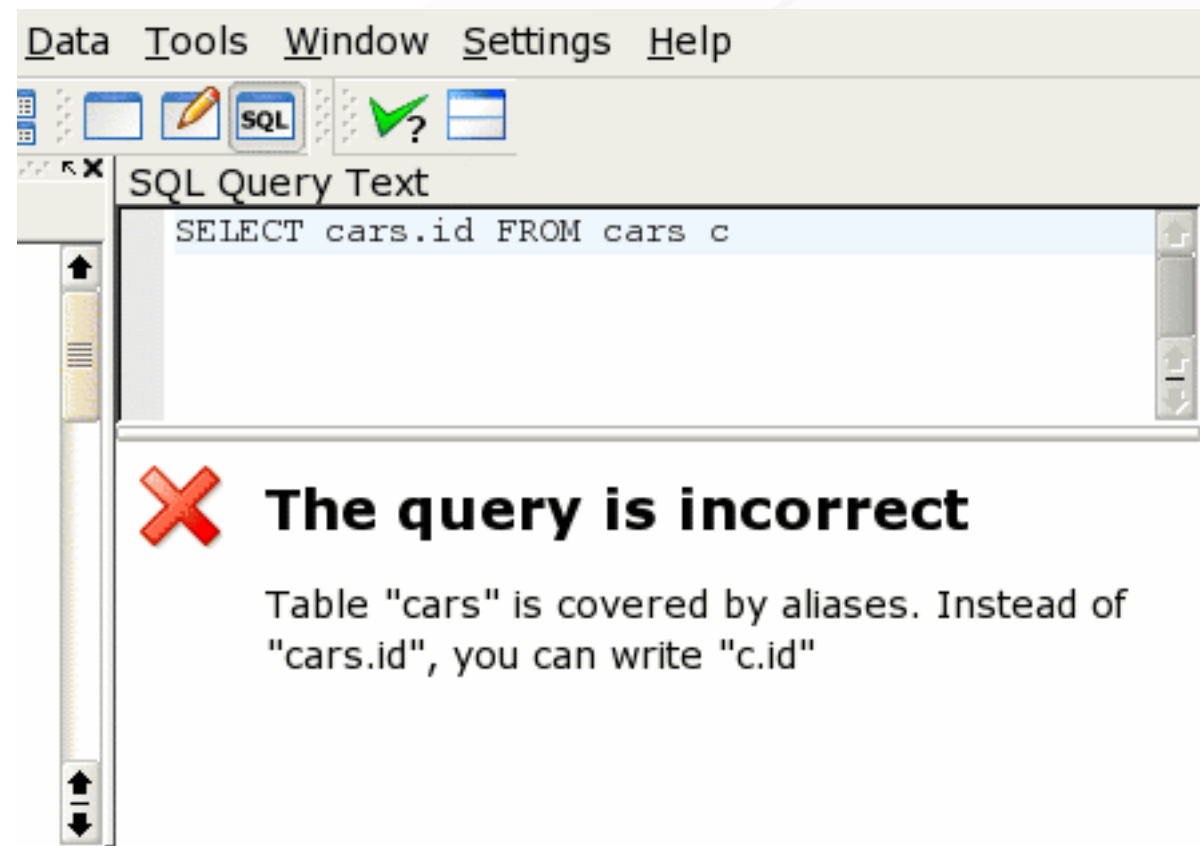


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## Predicate – what's in the box?

- **Built-in SQL parser provides probably the only Qt-based framework for employing type-safe SQL queries within applications**





## Predicate – what's in the box? (3)

- Strong data typing and constraints (general feature of databases)
  - Types and support for constraints generalized for typical usage

	Id	Place	Date	Photo	Private
	1	Michał	2006-03-22		
	2	Augustów	2006-06-20		
	3	OpenSUSE	2006-13-20		
	12 (autonumber)				

Error: Date?



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## Predicate and QSql

API features	QtSql	Predicate
Data Definition Language		+
Data Manipulation Language		+
SQL	+	+
SQL Parsing		+
Data & Project Migration		+
MVC API	+	+



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## **Predicate and ODBC**

- **ODBC specification is good but its implementation is simplistic (you may need to depend on 3<sup>rd</sup> party commercial drivers)**
- **ODBC is not a solution as your appetite for generic data API increases**
- **So there's a plan for Predicate to wrap ODBC**





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## Predicate – what's in the box? (4)

- MS Access data import
- Database import from PostgreSQL and MySQL servers to a file

Microsoft Access window showing a table with columns: Supplier ID, Company Name, Contact Name, Contact Title, and Address. The table contains 11 rows of data.

Kexi window showing a table with columns: supplierid, companyname, and contactname. The table contains 18 rows of data.

MS Access





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## **Predicate – what's not included?**

- **Database administering and tuning tools  
(use dedicated for particular db backend)**

**MySQL  
Administrator**

**pgAdmin**  
PostgreSQL Tools



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## **Predicate – how to get it?**

- **KDE SVN: [trunk/koffice/kexi/kexidb/](http://trunk/koffice/kexi/kexidb/)**
- **will be moved to [trunk/???.predicate/](http://trunk/???.predicate/)**

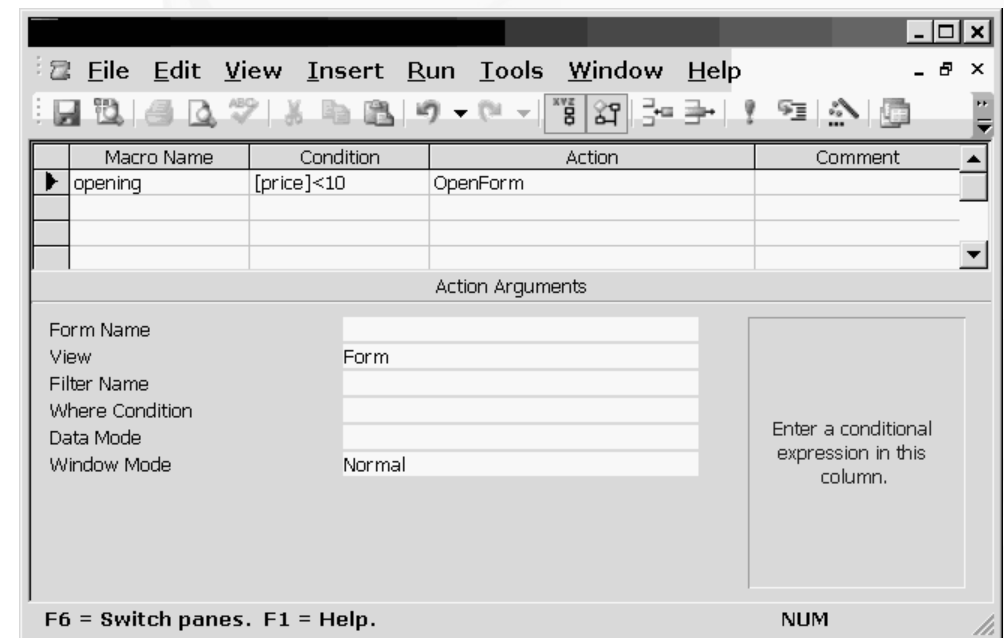


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## Predicate - Plans

- **Providing Kexi plugins for other KDE apps: designer tools for tables, queries and forms, data widget, simple printouts**
- **Macros framework (in MS Access style) - a good companion for Kross**



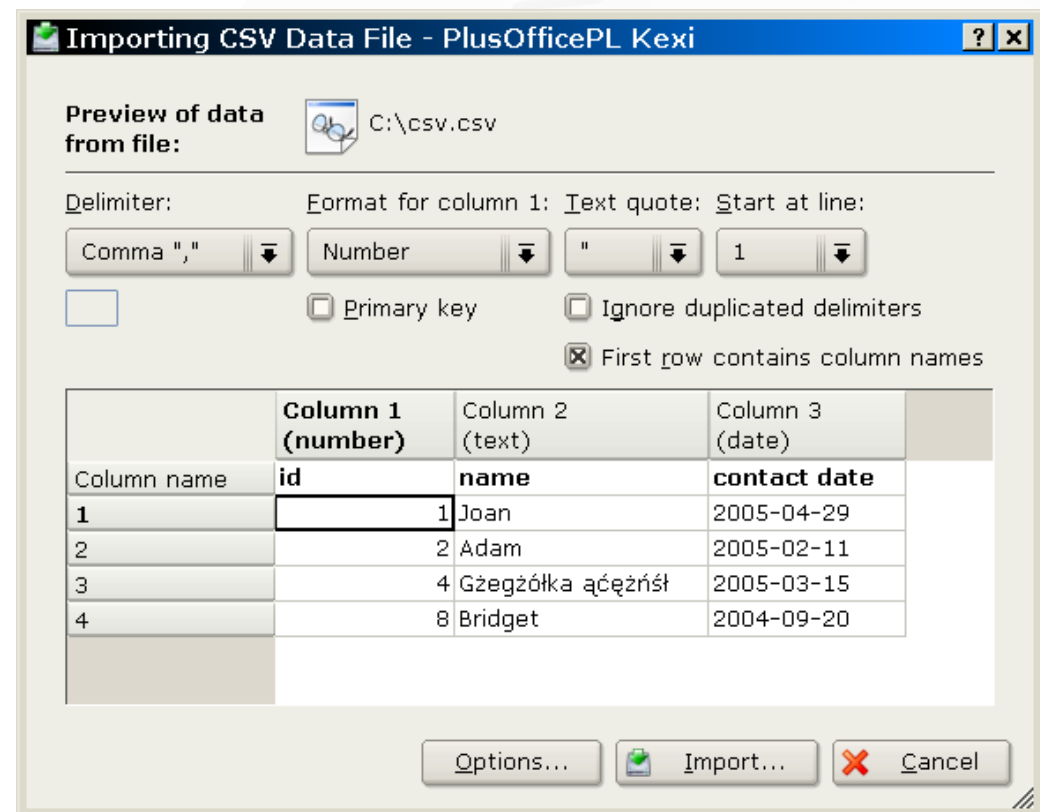


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## Predicate – Plans

- **Providing Kexi plugins for other KDE apps:**
  - **table, query and form designer tools**
  - **data-aware widgets**
  - **simple printouts**
  - **CSV import/export**





## **Predicate – Plans**

- **A way for dealing with native data sources and queries:  
deal with them as black boxes not available for direct data binding to the GUI, etc.**
- **Advantage: proprietary or not yet supported features can be used out of the box by knowledgeable users**
- **Side effects: executing native DML queries can introduce inconsistencies**



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## **Kexi 2 - Plans**

- **More SQL features (grouping, improving the parser, alter table)**
- **Full text search, bindings to the upcoming KDE search facilities**
- **Reports using KOffice text layout engine with support for ODF**



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## **Kexi 2 – Plans (2)**

- **Multithreading – optimization for large data sets**
- **Live data sharing ala (MS DDE) Dynamic Data Exchange, hopefully a companion to D-BUS**
- **Think about Qt-only and/or non-Qt users of the facilities?**





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**Thank you.**  
**Questions?**  
**Ideas?**

**More info:**

- <http://www.kexi-project.org>
- <http://www.koffice.org/kexi>

**API Docs:**

- <http://www.kexi-project.org/predicate>

