

# Datenbanksysteme 2011

Anfang von Kapitel 10:  
Datenbankapplikationen  
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# Datenbankapplikationen

ODBC

MS Visio

MS Access

Embedded SQL

JDBC Application

SQLJ

SQLite / HSQLDB

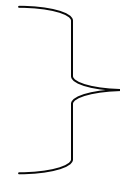
JDBC Applet

Java Servlet

Java Server Pages

PHP

Ruby on Rails



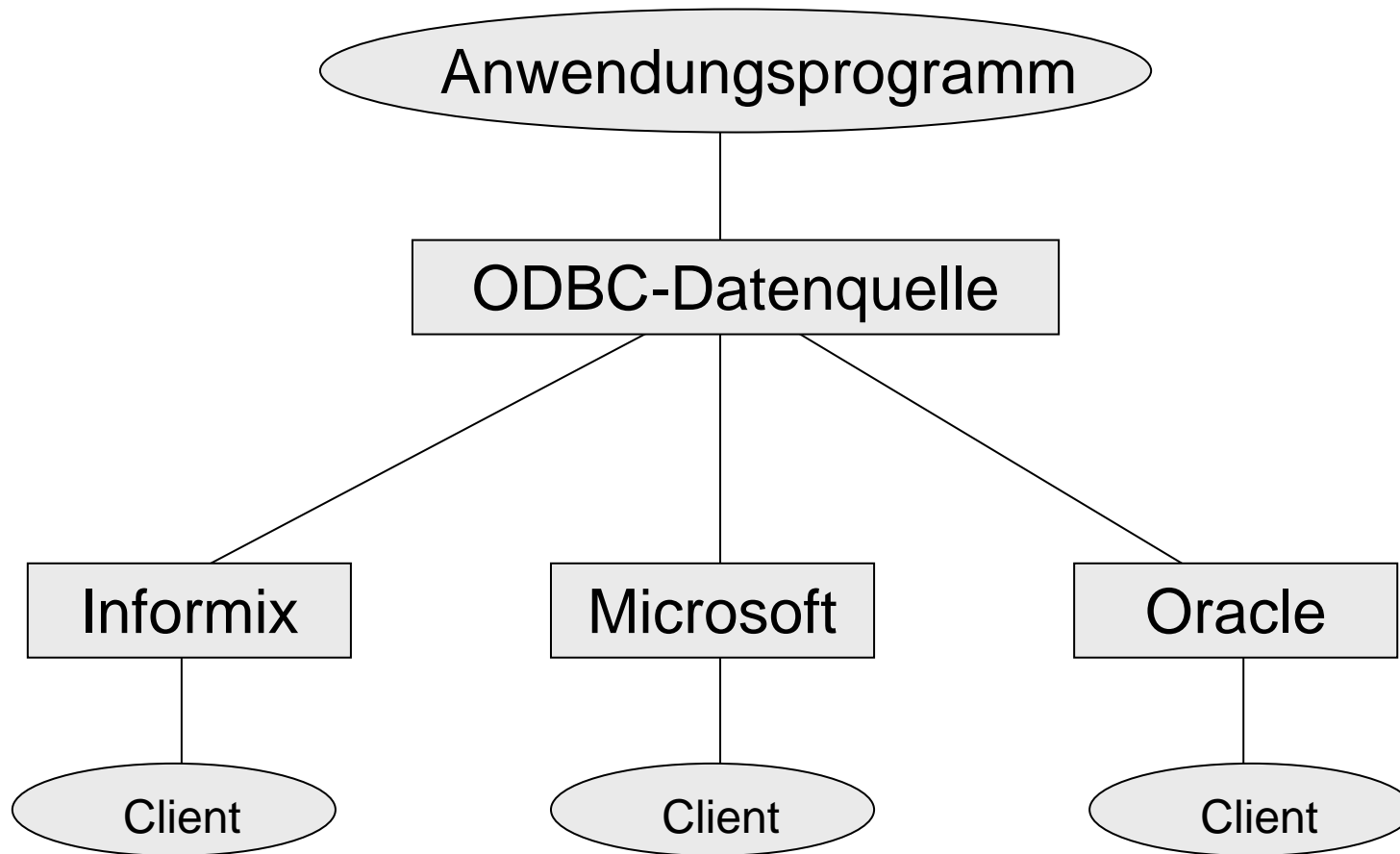
DQ im  
Client



DB-Server-Protokoll

# ODBC

Open Data base connectivity



# MySQL Connector

<http://www.mysql.com/products/connector/>

The screenshot shows a Mozilla Firefox browser window displaying the MySQL Connectors page. The browser's address bar shows the URL <http://www.mysql.com/products/connector/>. The page features the MySQL logo and the Sun Microsystems logo. A navigation menu includes links for Products, Downloads, Documentation, Services, Customers, Why MySQL?, News & Events, and How to Buy. A sidebar on the left lists various MySQL products, with MySQL Connectors highlighted. The main content area is titled "MySQL Connectors" and contains a table of driver options.

**MySQL Connectors**

MySQL provides standards-based drivers for JDBC, ODBC, and .Net enabling developers to build database applications in their language of choice. In addition, a native C library allows developers to embed MySQL directly into their applications.

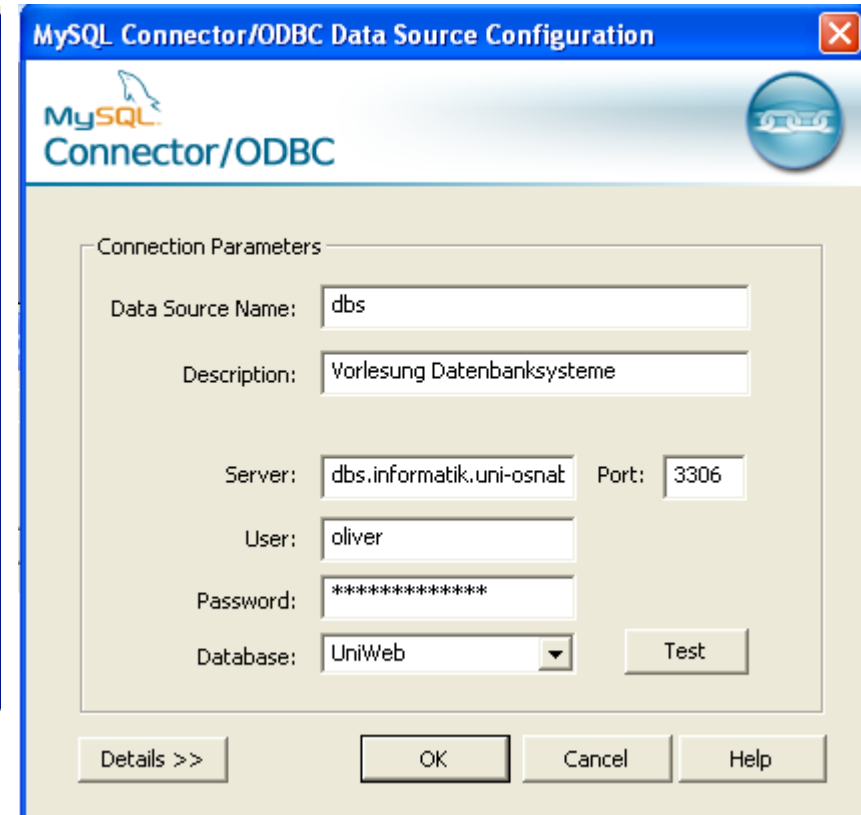
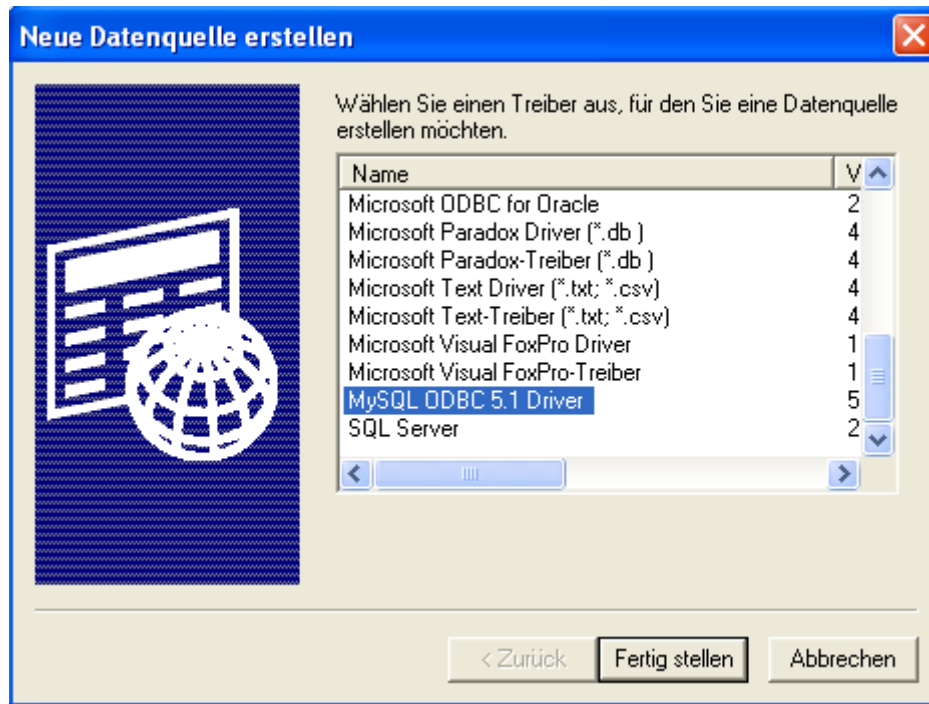
Developed by MySQL			
<b>ADO.NET Driver for MySQL (Connector/NET)</b>	<a href="#">Download</a>	<a href="#">Documentation</a>	<a href="#">Discussion</a>
<b>ODBC Driver for MySQL (Connector/ODBC)</b>	<a href="#">Download</a>	<a href="#">Documentation</a>	<a href="#">Discussion</a>
<b>JDBC Driver for MySQL (Connector/J)</b>	<a href="#">Download</a>	<a href="#">Documentation</a>	<a href="#">Discussion</a>
<b>MXJ Driver for MySQL (Connector/MXJ)</b>	<a href="#">Download</a>	<a href="#">Documentation</a>	<a href="#">Discussion</a>
<b>C++ Driver for MySQL (Connector/C++)</b>	<a href="#">Download</a>	<a href="#">Documentation</a>	<a href="#">Discussion</a>
<b>C Driver for MySQL (Connector/C)</b>	<a href="#">Download</a>	<a href="#">Documentation</a>	<a href="#">Discussion</a>
<b>C API for MySQL (mysqlclient)</b>	<a href="#">Download</a>	<a href="#">Documentation</a>	<a href="#">Discussion</a>

**Contact Sales**

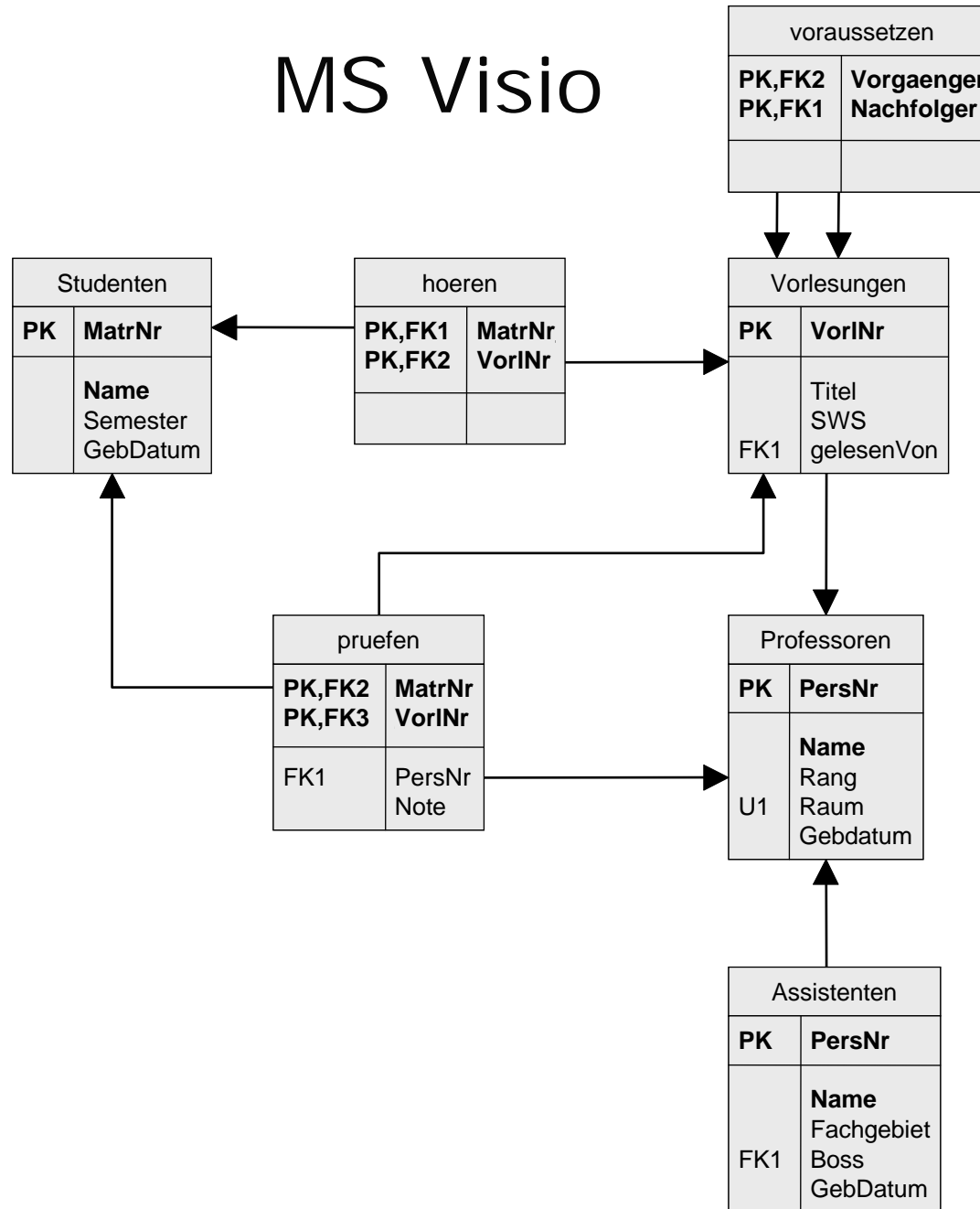
USA - Toll Free: +1-866-221-0634  
USA - From abroad:  
+1-208-327-6494  
USA - Subscription Renewals:  
+1-866-221-0634  
Latin America: +1 512 535 7751

<http://dev.mysql.com/downloads/connector/j/>

# Datenquelle hinzufügen



# MS Visio



# MS Access

Stand-alone Datenbanksystem

Frontend per ODBC für relationale Datenbank

- Schemadesign
- Beziehungen
- Queries
- Berichte
- Formulare
- VBA-Skript

# MS Access Tabelle

**Person : Tabelle**

Feldname	Felddatentyp	Beschreibung
persnr	AutoWert	Personalnummer
name	Text	Name der Person
rang	Text	Besoldungsstufe
gebdatum	Datum/Uhrzeit	Geburtsdatum
gehalt	Währung	Gehalt
foto	OLE-Objekt	Passbild

Feldeigenschaften

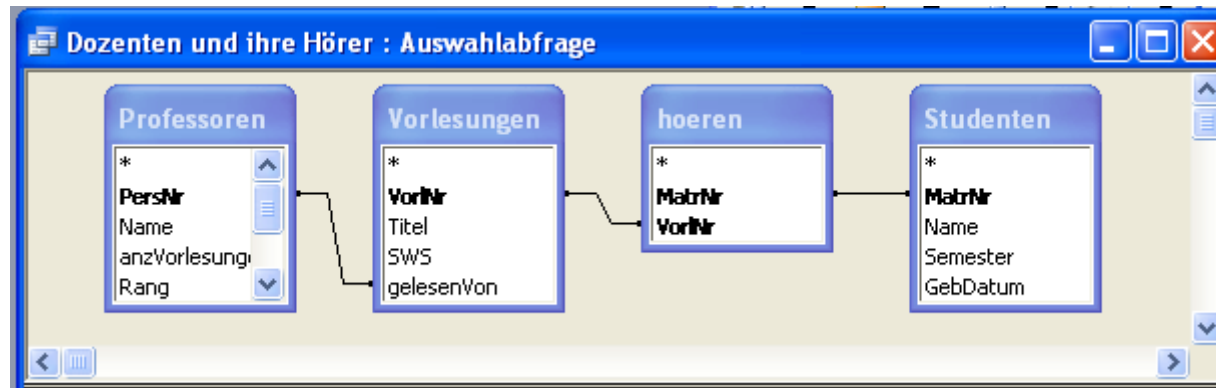
Allgemein | **Nachschlagen**

Feldgröße	2
Format	
Eingabeformat	
Beschriftung	
Standardwert	
Gültigkeitsregel	'C2' oder 'C3' oder 'C4'
Gültigkeitsmeldung	Bitte auf Rang achten !!
Eingabe erforderlich	Nein
Leere Zeichenfolge	Ja
Indiziert	Nein
Unicode-Kompression	Ja
IME-Modus	Keine Kontrolle
IME-Satzmodus	Keine
Smarttags	

Ein Ausdruck, der die Werte einschränkt, die in das Feld eingegeben werden können.



# MS Access Abfrage



```
SELECT Professoren.Name AS Dozenten, Studenten.Name AS Hörer
FROM ((Vorlesungen INNER JOIN hoeren ON
Vorlesungen.VorlNr= hoeren.VorlNr)
INNER JOIN Studenten ON hoeren.MatrNr=Studenten.MatrNr)
INNER JOIN Professoren ON
Vorlesungen.gelesenVon=Professoren.PersNr;
```

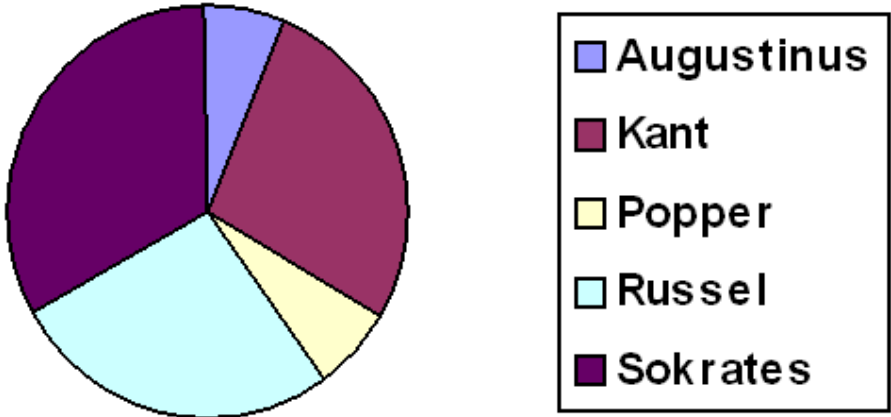
# MS Access Bericht



The screenshot shows a Microsoft Access report window titled "prof+stud.doc". The report is titled "Dozenten und ihre Hörer" in a blue, italicized font. It is divided into two columns: "Professor" and "Student".

<i>Professor</i>	<i>Student</i>
Augustinus	Feuerbach
	Jonas
Kant	Feuerbach
	Fichte
	Schopenhauer
	Theophrastos
Popper	Carnap
Russel	Carnap
Sokrates	Carnap
	Schopenhauer
	Theophrastos

Lehrbelastung



# MS Access Formular

Prof+Assi : Formular

**Stammdaten der Professoren**

PersNr:

Name:

Rang:

Raum:

**Stammdaten der zugehörigen Assistenten**

Personalnummer	Name	Fachgebiet
<input type="text" value="3005"/>	<input type="text" value="Rethikus"/>	<input type="text" value="Planetenbewegung"/>
<input type="text" value="3006"/>	<input type="text" value="Newton"/>	<input type="text" value="Keplersche Gesetze"/>
* <input type="text"/>	<input type="text"/>	<input type="text"/>

Datensatz:  von 7

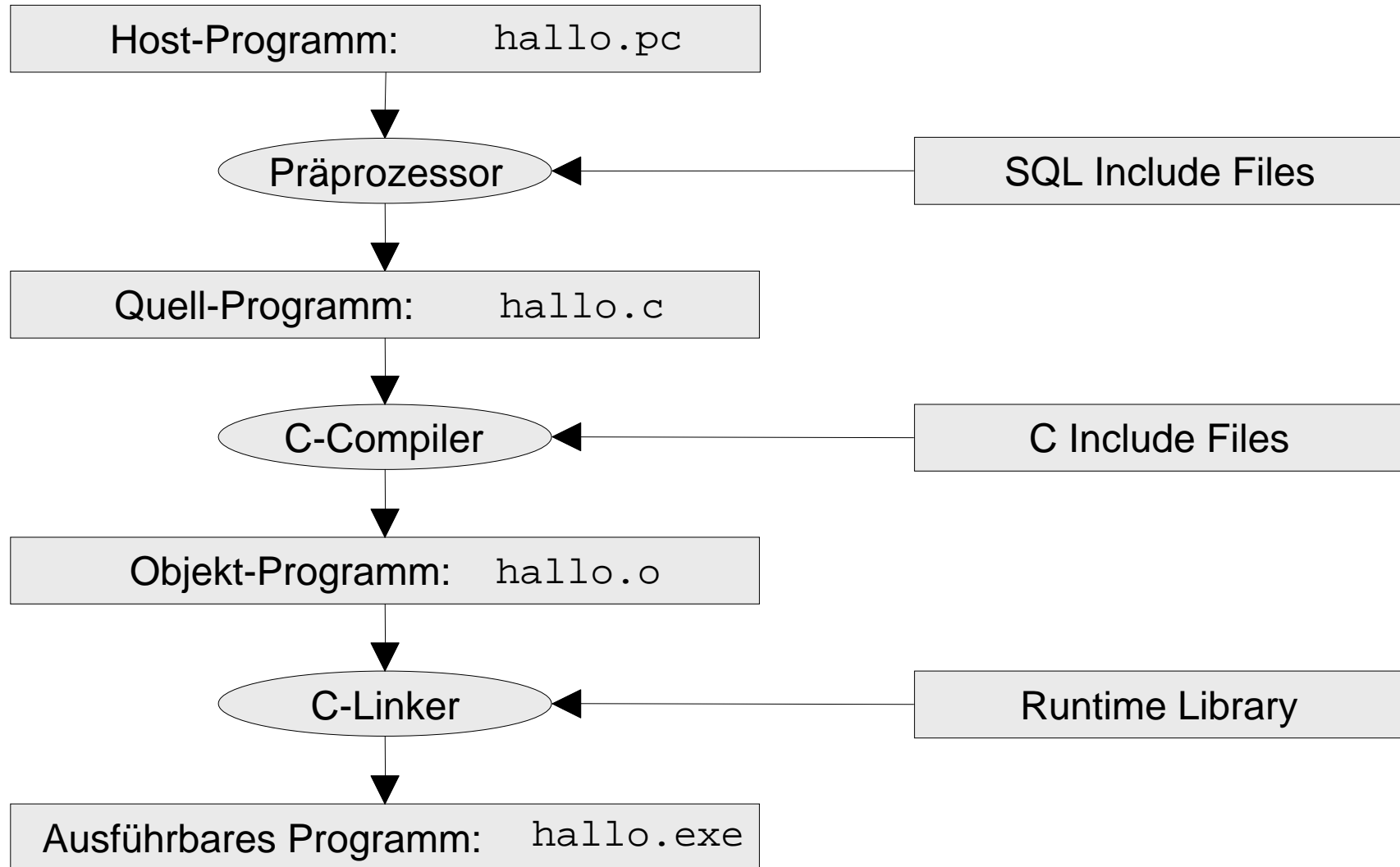
# MS Access Visual Basic for Applications

```
Private Sub berechne_Click()  
Dim rang As String  
Select Case gehaltsgruppe.Value  
Case 1  
    rang = "C2"  
Case 2  
    rang = "C3"  
Case 3  
    rang = "C4"  
Case Else  
    rang = " "  
End Select  
If rang = " "  
    Then MsgBox ("Rang fehlt !!!")  
Else  
Dim rs As Recordset  
Set rs = CurrentDb.OpenRecordset("Select name, gebdatum from professoren " & _  
"where gebdatum = (select min(gebdatum) from professoren " & _  
"where rang = '" & rang & "'")  
ausgabe.Value = rs.Fields("name").Value & ", geboren am " & rs.Fields("gebdatum")  
End If  
End Sub
```

# Datenbankapplikationen

- MS Visio
- MS Access
- Embedded SQL im C-Programm
- JDBC / SQLJ Application
- SQLite / HSQLDB
- JDBC Applet
- Java Servlet
- Java Server Pages
- PHP
- Ruby on Rails

# Embedded SQL (Microsoft)



# Hostvariable

```
int    persnr;           // Personalnummer
char   name[20];        // Name
char   rang[3];         // Rang
int    raum;            // Raum
char   gebdatum[17];    // Geburtsdatum

short  raum_ind;        // Raum-Indikator
```

Innerhalb von SQL-Statements:  
Doppelpunkt (:) voranstellen !

# Select

```
EXEC SQL SELECT persnr, raum
        INTO :persnr, :raum INDICATOR :raum_ind
        FROM Professoren
        WHERE PersNr = 2125;
```

```
if (raum_ind == -1)
printf("Personalnummer %d ohne Raumangabe \n",persnr);
```

<http://www-lehre.inf.uos.de/~dbs/2011/ESQL-Microsoft/beispiel.sqc>

<http://www-lehre.inf.uos.de/~dbs/2011/ESQL-Microsoft/beispiel.c>



# beispiel.exe

```
C:\WINNT\System32\cmd.exe
Datenträgernummer: 0112-0BC0

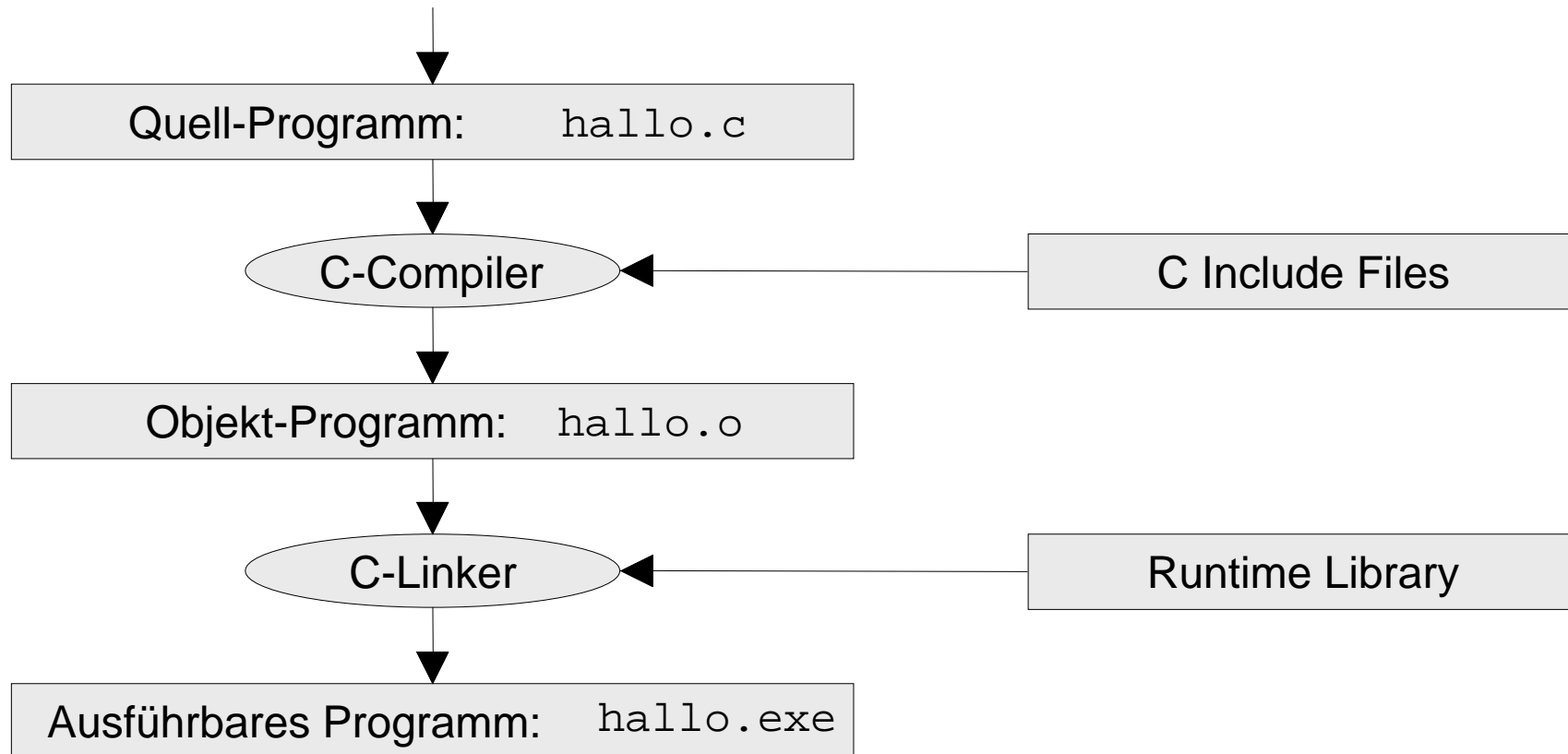
Verzeichnis von L:\dbs\2003\Developer\Skript\ESQL-Microsoft

26.05.2003  11:07      <DIR>          .
28.05.2003  09:56      <DIR>          ..
23.01.2003  14:38                272  readme.txt
23.01.2003  14:38           126.976  sqlakw32.dll
23.01.2003  14:38           162.733  unzip_esqlc.exe
23.01.2003  14:38             3.244  beispiel.sqc
23.01.2003  14:38           45.056  beispiel.exe
                5 Datei(en)           338.281 Bytes
                2 Verzeichnis(se), 10.792.992.768 Bytes frei

L:\dbs\2003\Developer\Skript\ESQL-Microsoft>beispiel
Verbindung zum SQL Server aufgebaut!
Bitte Rang eingeben: C4
Mit Rang C4 gespeichert:
2125 Sokrates      C4 226 23 08 1923  0:00
2126 Russel       C4 232 10 07 1934  0:00
2136 Curie        C4  36 10 05 1929  0:00
2137 Kant         C4   7 04 04 1950  0:00

L:\dbs\2003\Developer\Skript\ESQL-Microsoft>
```

# Embedded SQL (MySQL)



# beispiel.c [Teil 1]

```
#include <mysql.h>
#include <stdio.h>
main() {
    MYSQL      *conn;
    MYSQL_RES  *res;
    MYSQL_ROW  row;
    char *server    = "dbs.informatik.uni-osnabrueck.de";
    char *user      = "erika";
    char *password  = "mustermann";
    char *database  = "UniWeb";
    char query[80] = "select * from Professoren where rang =";
    char rang[3];
    conn = mysql_init(NULL);
    mysql_real_connect(conn, server, user, password,
                      database, 0, NULL, 0));
```

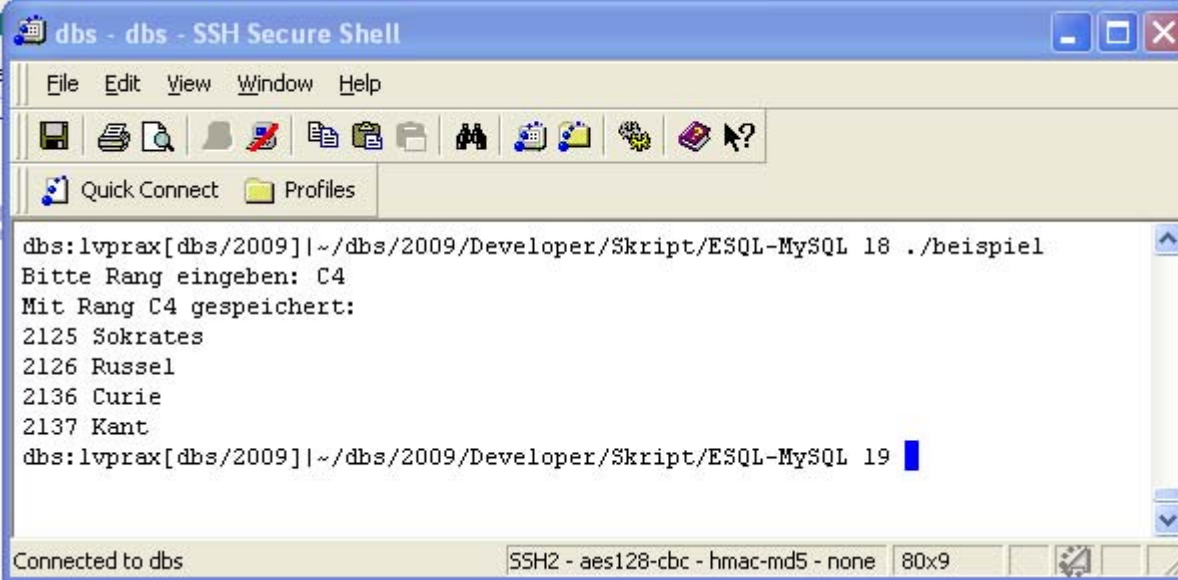
## beispiel.c [Teil 2]

```
printf("Bitte Rang eingeben: ");
scanf("%s", rang);
printf("Mit Rang %s gespeichert:\n", rang);
strcat(query, "'"); strcat(query, rang);
strcat(query, "'");
mysql_query(conn, query);
res = mysql_use_result(conn);
while ((row = mysql_fetch_row(res)) != NULL)
    printf("%s %s \n", row[0], row[1]);
mysql_free_result(res);
mysql_close(conn);
}
```

<http://www-lehre.inf.uos.de/~dbs/2011/ESQL-MySQL/beispiel1.c>

# beispiel.exe

```
gcc -o beispiel `mysql_config --cflags` beispiel.c `mysql_config --libs`
```



The screenshot shows a terminal window titled "dbs - dbs - SSH Secure Shell". The terminal content is as follows:

```
dbs:lvprax[dbs/2009]|~/dbs/2009/Developer/Skript/ESQL-MySQL 18 ./beispiel
Bitte Rang eingeben: C4
Mit Rang C4 gespeichert:
2125 Sokrates
2126 Russel
2136 Curie
2137 Kant
dbs:lvprax[dbs/2009]|~/dbs/2009/Developer/Skript/ESQL-MySQL 19
```

The terminal window also shows a menu bar (File, Edit, View, Window, Help), a toolbar with various icons, and a status bar at the bottom indicating "Connected to dbs" and "SSH2 - aes128-cbc - hmac-md5 - none 80x9".

SSH