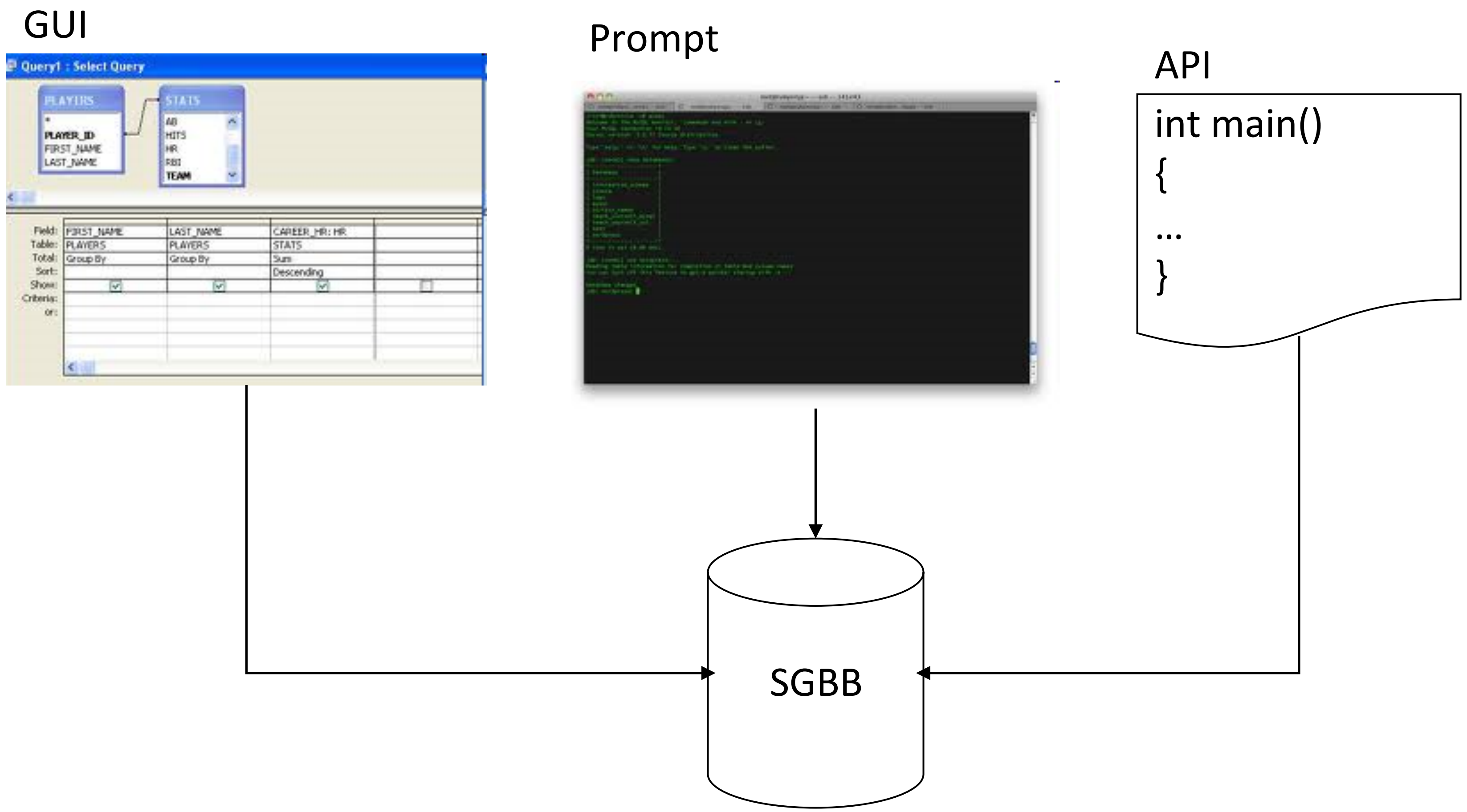
Programando em BD

Lubia Vinhas

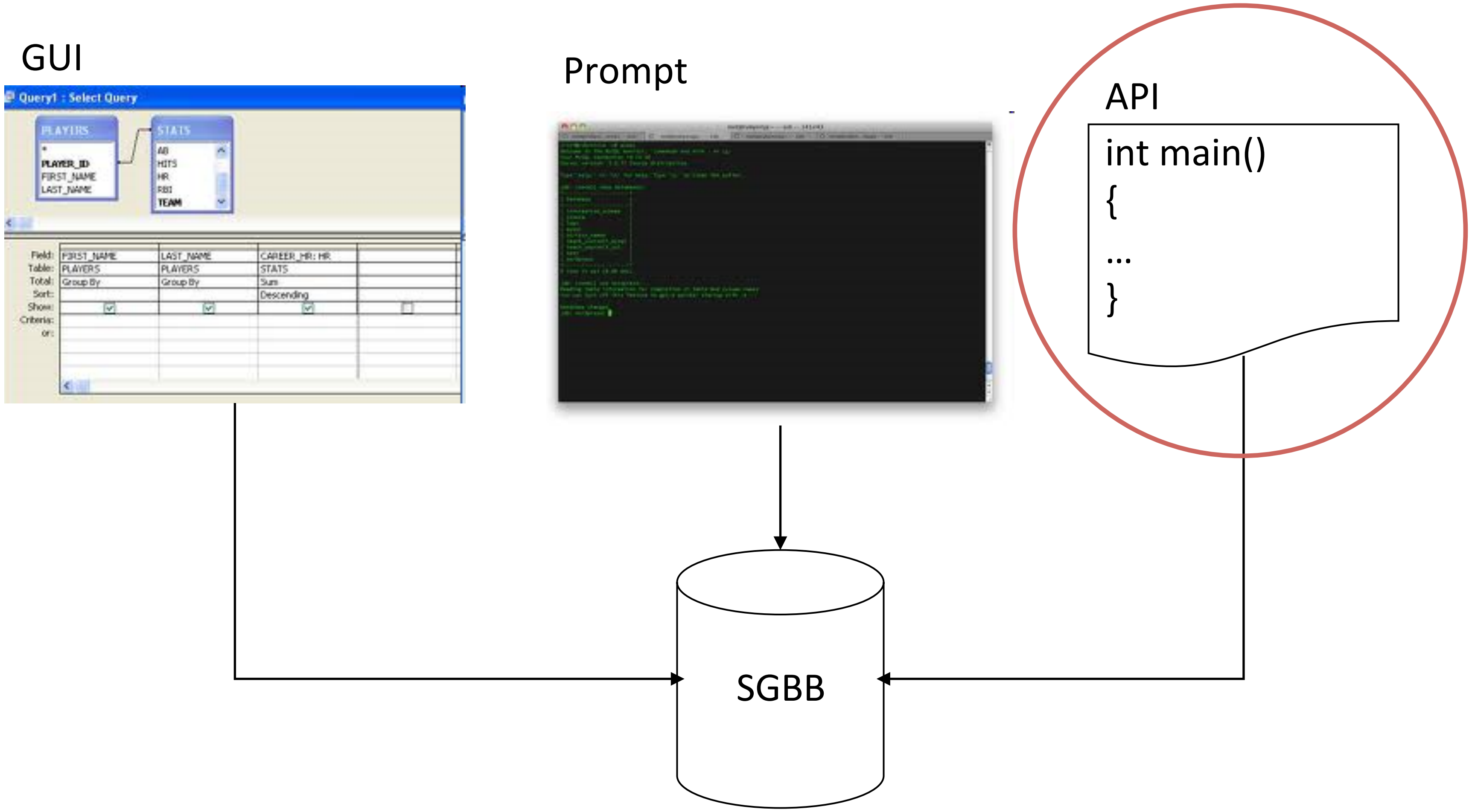
Interfaces SGBD



Field:	FIRST_NAME	LAST_NAME	CAREER_HR: HR	
Table:	PLAYERS	PLAYERS	STATS	
Total:	Group By	Group By	Sum	
Sort:			Descending	
Show:	✓	✓	✓	☐
Criteria:				
or:				

```
int main()
{
…
}
```

Interfaces SGBD



Query1 : Select Query

PLAYERS: *, PLAYER_ID, FIRST_NAME, LAST_NAME

STATS: AB, HITS, HR, RBI, TEAM

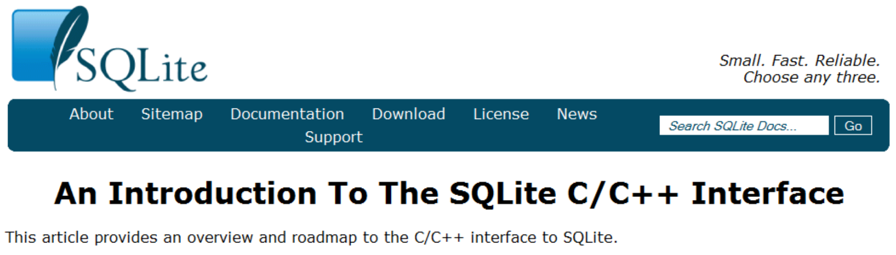
Field:	FIRST_NAME	LAST_NAME	CAREER_HR: HR	
Table:	PLAYERS	PLAYERS	STATS	
Total:	Group By	Group By	Sum	
Sort:			Descending	
Show:	✓	✓	✓	☐
Criteria:				
or:				

```
int main()
{
…
}
```

API para SGBD

- Uma API é uma biblioteca de código em alguma linguagem de programação de forma que você possa criar um programa que converse com o banco
- Pra isso você precisa de um ambiente de edição, compilação e linking para aquela linguagem

Exemplos



SQLite

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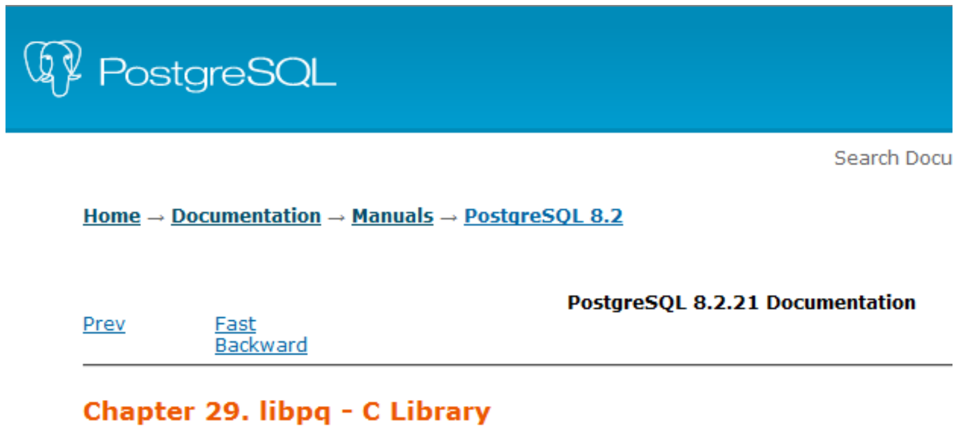
An Introduction To The SQLite C/C++ Interface

This article provides an overview and roadmap to the C/C++ interface to SQLite.



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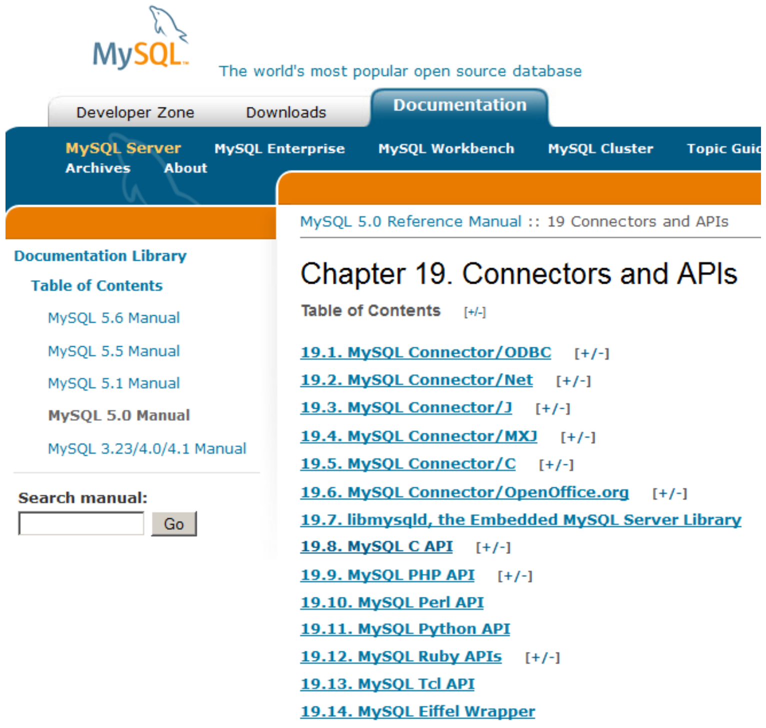

MySQL

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Chapter 19. Connectors and APIs

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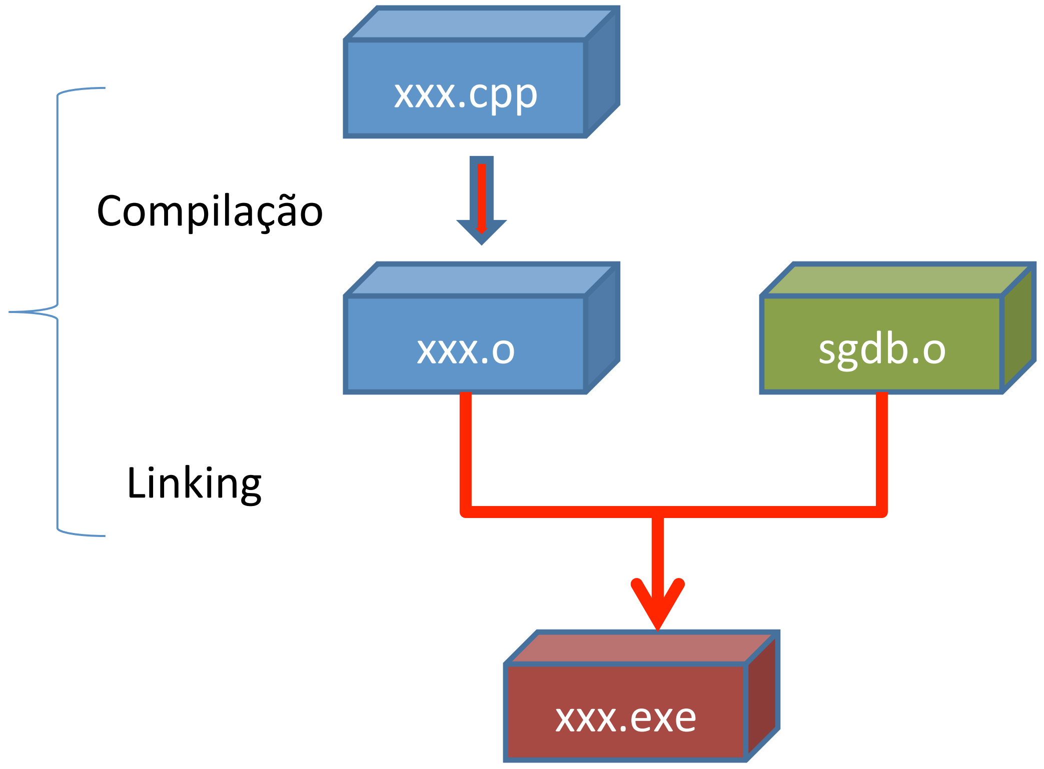
API para SGBD

Ambiente:
editor,
compilador,
linker.
...



APIs para SGBD

- Objetos: quais são os objetos que representam os diferentes componentes do SBGD
- Funções: quais as funções sobre esses objetos

Exemplo: SQLite

- Objetos:

  `sqlite3` : representa uma conexão ao SGBD

  `sqlite3_stmt`: representa um comando a ser submetido ao SGBD

- Funções:

```
sqlite3_open()
sqlite3_prepare()
sqlite3_step()
sqlite3_column()
sqlite3_finalize()
sqlite3_close()
```

Exemplo: SQLite e C++

```
#include <stdio.h>
#include <sqlite3.h>

int main(int argc, char* argv[])
{
   sqlite3 *db;
   char *zErrMsg = 0;
   int rc;

   rc = sqlite3_open("test.db", &db);

   if( rc ){
      fprintf(stderr, "Can't open database: %s\n", sqlite3_errmsg(db));
      exit(0);
   }else{
      fprintf(stderr, "Opened database successfully\n");
   }
   sqlite3_close(db);
}
```

```
$gcc test.c -l sqlite3
$./a.out
Opened database successfully
```

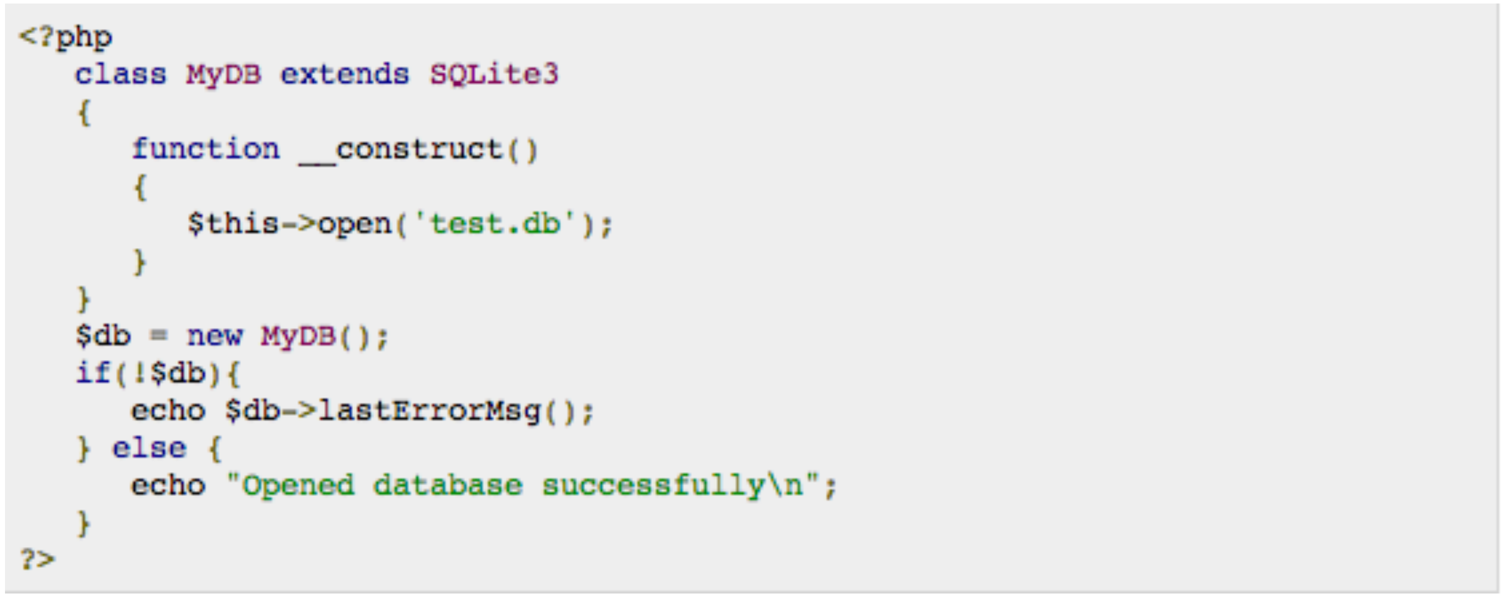
Exemplo: SQLite e JAVA

```java
import java.sql.*;

public class SQLiteJDBC
{
  public static void main( String args[] )
  {
    Connection c = null;
    try {
      Class.forName("org.sqlite.JDBC");
      c = DriverManager.getConnection("jdbc:sqlite:test.db");
    } catch ( Exception e ) {
      System.err.println( e.getClass().getName() + ": " + e.getMessage() );
      System.exit(0);
    }
    System.out.println("Opened database successfully");
  }
}
```

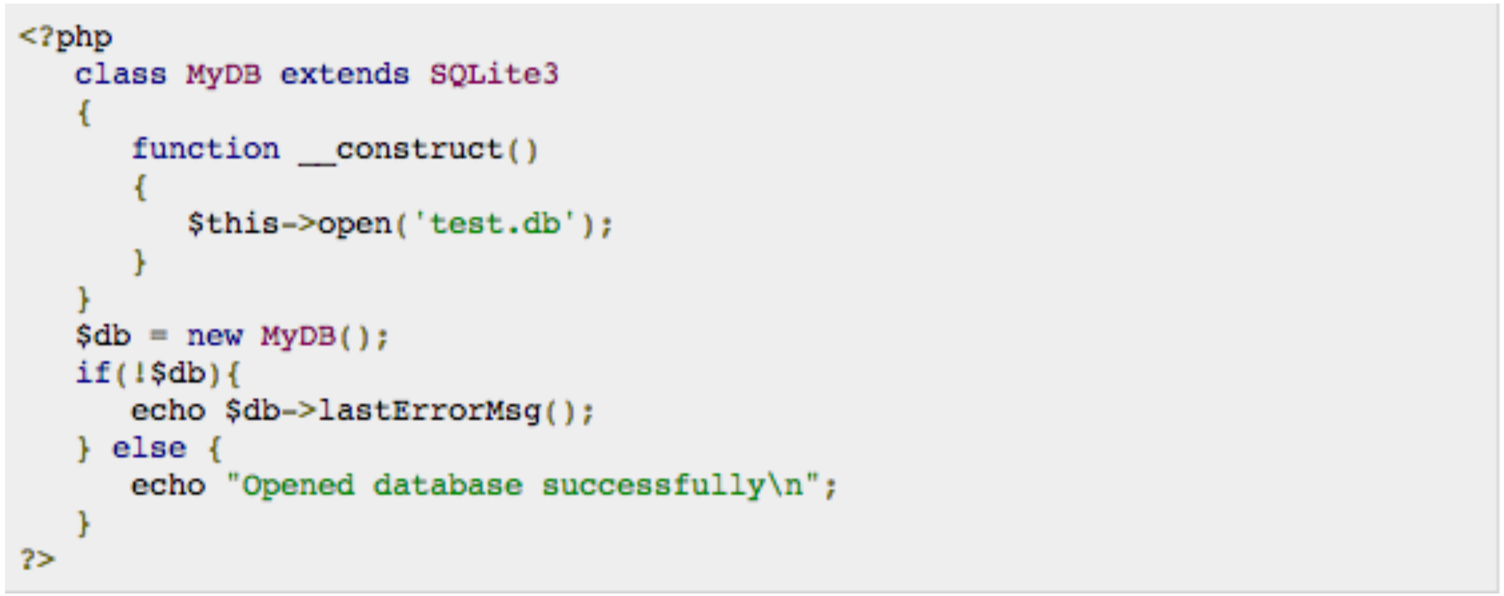
```
$javac SQLiteJDBC.java
$java -classpath ".:sqlite-jdbc-3.7.2.jar" SQLiteJDBC
Open database successfully
```

Exemplo: SQLite e PHP



```
<?php
   class MyDB extends SQLite3
   {
      function __construct()
      {
         $this->open('test.db');
      }
   }
   $db = new MyDB();
   if(!$db){
      echo $db->lastErrorMsg();
   } else {
      echo "Opened database successfully\n";
   }
?>
```

Exemplo: SQLite e PHP



```php
<?php
   class MyDB extends SQLite3
   {
      function __construct()
      {
         $this->open('test.db');
      }
   }
   $db = new MyDB();
   if(!$db){
      echo $db->lastErrorMsg();
   } else {
      echo "Opened database successfully\n";
   }
?>
```

Exemplo: SQLite e Python

```
#!/usr/bin/python

import sqlite3

conn = sqlite3.connect('test.db')

print "Opened database successfully";
```

```
$chmod +x sqlite.py
$./sqlite.py
Open database successfully
```

```
  try {
    /*
    * Load the JDBC driver and establish a connection.
    */
    Class.forName("org.postgresql.Driver");
    String url = "jdbc:postgresql://localhost:5432/database";
    conn = DriverManager.getConnection(url, "postgres", "");
    /*
    * Add the geometry types to the connection. Note that you
    * must cast the connection to the pgsql-specific connection
    * implementation before calling the addDataType() method.
    */
    ((org.postgresql.PGConnection)conn).addDataType("geometry",Class.forName("org.postgis.PGgeometry"));
    ((org.postgresql.PGConnection)conn).addDataType("box3d",Class.forName("org.postgis.PGbox3d"));

    /*
    * Create a statement and execute a select query.
    */
    Statement s = conn.createStatement();
    ResultSet r = s.executeQuery("select geom,id from geomtable");
    while( r.next() ) {
      /*
      * Retrieve the geometry as an object then cast it to the geometry type.
      * Print things out.
      */
      PGgeometry geom = (PGgeometry)r.getObject(1);
      int id = r.getInt(2);
      System.out.println("Row " + id + ":");
      System.out.println(geom.toString());
    }
    s.close();
    conn.close();
  }
catch( Exception e ) {
  e.printStackTrace();
```