[Android] SQLite数据库之增删改查基础操作



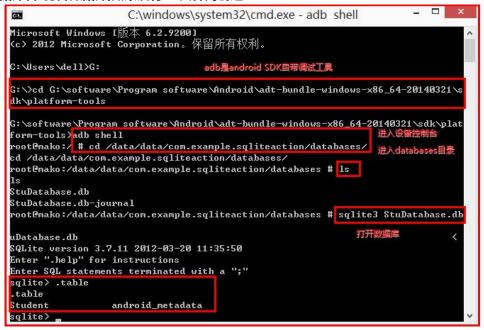
在编程中经常会遇到数据库的操作,而Android系统内置了SQLite,它是一款轻型数据库,遵守事务ACID的关系型数据库管理系统,它占用的资源非常低,能够 支持Windows/Linux/Unix等主流操作系统, 同时能够跟很多程序语言如C#、PHP、Java等相结合.下面先回顾SQL的基本语句,再讲述Android的基本操作.

一. adb shell回顾SQL语句

首先,我感觉自己整个大学印象最深的几门课就包括《数据库》,所以想先回顾SQL增删改查的基本语句.而在Android SDK中adb是自带的调试工具,它存放在sdk的platform-tools目录下,通过adb shell可以进入设备控制台,操作SQL语句.

```
G:
cd G:\software\Program software\Android\adt-bundle-windows-x86_64-20140321\sdk\platform-tools
adb shell
cd /data/data/com.example.sqliteaction/databases/
sqlite3 StuDatabase.db
.table
.schema
```

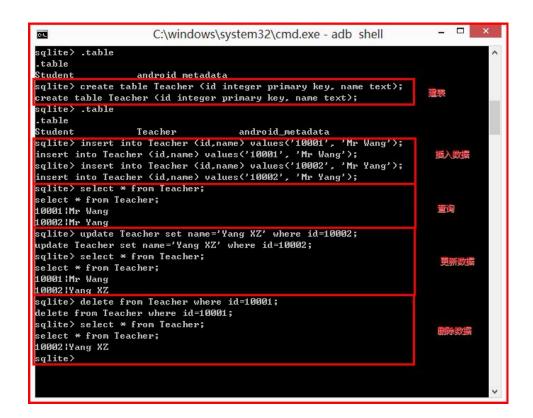
如下所示我先创建了SQLiteAction工程,同时在工程中创建了StuDatabase.db数据库.输入adb shell进入设备控制台,调用"sqlite3+数据库名"打开数据库,如果没有db文件则创建.



然后如下图所示,可以输入SQL语句执行增删改查.注意很容易写错SQL语句,如忘记")"或结束";"导致cmd中调用出错.

```
-- 创建Teacher表
create table Teacher (id integer primary key, name text);
-- 向表中插入数据
insert into Teacher (id,name) values('10001', 'Mr Wang');
```

```
insert into Teacher (id,name) values('10002', 'Mr Yang');
select * from Teacher;
-- 更新数据
update Teacher set name='Yang XZ' where id=10002;
-- 删除数据
delete from Teacher where id=10001;
```



二. SQLite数据库操作

下面讲解使用SQLite操作数据库:

1.创建打开数据库

使用openOrCreateDatabase函数实现,它会自动检测是否存在该数据库,如果存在则打开,否则创建一个数据库,并返回一个SQLiteDatabase对象.

2.创建表

通过定义建表的SQL语句,再调用execSQL方法执行该SQL语句实现建立表.

3.插入数据

使用insert方法添加数据,其实ContentValues就是一个Map,Key字段名称,Value值.

SQLiteDatabase.insert(

String table, //添加数据的表名

String nullColumnHack,//为某些空的列自动复制NULL ContentValues values //ContentValues的put()方法添加数据

4.删除数据

);

使用delete方法删除表中数据,其中sqlHelper是继承SQLiteDatabase自定义类的实例.

```
SQLiteDatabase.delete(
```

```
String table, //表名
String whereClause, //约束删除行,不指定默认删除所有行
String[] whereArgs //对应数据
);

//方法一 删除身高>175cm
SQLiteDatabase db = sqlHelper.getWritableDatabase();
db.delete("Student", "height > ?", new String[] {"175"});
```

5.更新数据

db.execSQL(deleteData);

//方法二

使用update方法可以修改数据,SQL+execSQL方法就不在叙述.

String deleteData = "DELETE FROM Student WHERE height>175";

```
//小明的身高修改为180

SQLiteDatabase db = sqlHelper.getWritableDatabase();

ContentValues values = new ContentValues();
values.put("height", "180");
db.update("Student", values, "name = ?", new String[] {"XiaoMing"});
```

6.其他操作

下面是关于数据库的其他操作,其中包括使用SQL语句执行,而查询数据Query方法由于涉及ListView显示,请见具体实例.

```
//关闭数据库
SQLiteDatabase.close();
//删除表 执行SQL语句
SQLiteDatabase.execSQL("DROP TABLE Student");
//删除数据库
this.deleteDatabase("StuDatabase.db");
//查询数据
```

三. 数据库操作简单实例

显示效果如下图所示:





首先,添加activity_main.xml文件布局如下:

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"</pre>
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/container"
    android:layout width="match parent"
    android:layout_height="match_parent"
    tools:context="com.example.touchimagetest.MainActivity"
    tools:ignore="MergeRootFrame" >
    <!-- 顶部 -->
    <RelativeLayout
        android:id="@+id/MyLayout_top"
        android:orientation="horizontal"
        android:layout width="fill parent"
        android:layout_height="40dp"
        android:layout alignParentTop="true" >
        <!-- 标题 -->
        <LinearLayout
                        android:orientation="horizontal"
                        android:layout width="fill parent"
                        android:layout height="fill parent"
                        android:gravity="center" >
                        <TextView
                                android:layout_width="wrap_content"
                                android:layout height="wrap content"
                                android:layout_weight="1"
                                android:gravity="center"
                                android:textSize="20sp"
                                android:text="学号" />
                        <TextView
                                android:layout_width="wrap_content"
                                android:layout height="wrap content"
                                android:layout_weight="1"
                                android:gravity="center"
                                android:textSize="20sp"
                                android:text="姓名" />
                        <TextView
                                android:layout_width="wrap_content"
                                android:layout height="wrap content"
```

```
android:layout weight="1"
                            android:gravity="center"
                            android:textSize="20sp"
                                                                                     android:text="电话" />
                    <TextView
                            android:layout_width="wrap_content"
                            android:layout height="wrap content"
                            android:layout_weight="1"
                            android:gravity="center"
                            android:textSize="20sp"
                            android:text="身高" />
            </LinearLayout>
</RelativeLayout>
<!-- 底部按钮 -->
<RelativeLayout
   android:id="@+id/MyLayout bottom"
   android:orientation="horizontal"
   android:layout_width="fill_parent"
   android:layout height="90dp"
   android:layout alignParentBottom="true"
   android:gravity="center">
   <LinearLayout
                    android:orientation="vertical"
                    android:layout width="fill parent"
                    android:layout_height="fill_parent"
                    android:layout alignParentBottom="true" >
            <LinearLayout
                            android:orientation="horizontal"
                            android:layout width="fill parent"
                            android:layout height="40dp"
                            android:gravity="center" >
                            <EditText
                                android:id="@+id/edit id"
                                    android:layout_width="wrap_content"
                                    android:layout height="wrap content"
                                    android:layout weight="1"
                                    android:gravity="center"
                                    android:textSize="20sp"
                                    android:hint="学号" />
                            <EditText
                                android:id="@+id/edit_name"
                                    android:layout width="wrap content"
                                    android:layout_height="wrap_content"
                                    android:layout weight="1"
                                    android:gravity="center"
                                    android:textSize="20sp"
                                    android:hint="姓名" />
                            <EditText
                                android:id="@+id/edit tel"
                                    android:layout_width="wrap_content"
                                    android:layout_height="wrap_content"
                                    android:layout weight="1"
                                    android:gravity="center"
                                    android:textSize="20sp"
                                    android:hint="电话" />
                            <EditText
                                android:id="@+id/edit height"
                                    android:layout_width="wrap_content"
                                    android:layout_height="wrap_content"
                                    android:layout weight="1"
                                    android:gravity="center"
```

```
android:hint="身高" />
                                                                                         </LinearLayout>
                <LinearLayout
                    android:layout_width="match_parent"
                    android:layout height="wrap content"
                    android:orientation="horizontal" >
                        <Button
                        android:id="@+id/button1"
                        android:layout_width="wrap_content"
                        android:layout height="match parent"
                        android:layout_weight="1"
                        android:text="创表" />
                   <Button
                        android:id="@+id/button2"
                        android:layout_width="wrap_content"
                        android:layout_height="match_parent"
                        android:layout weight="1"
                        android:text="插入" />
                        <Button
                        android:id="@+id/button3"
                        android:layout_width="wrap_content"
                        android:layout height="match parent"
                        android:layout_weight="1"
                        android:text="删除" />
                        <Button
                        android:id="@+id/button4"
                        android:layout width="wrap content"
                        android:layout_height="match_parent"
                        android:layout weight="1"
                        android:text="更新" />
                     <Button
                        android:id="@+id/button5"
                        android:layout width="wrap content"
                        android:layout height="match parent"
                        android:layout_weight="1"
                        android:text="查询" />
                  </LinearLayout>
              </LinearLayout>
    </RelativeLayout>
    <!-- 显示列表 -->
    <RelativeLayout
       android:id="@+id/Content_Layout"
        android:orientation="horizontal"
       android:layout_width="fill_parent"
       android:layout_height="fill_parent"
       android:layout above="@id/MyLayout bottom"
       android:layout below="@id/MyLayout top"
       android:background="#EFDFDF" >
                <!-- 显示表内容 -->
       <ListView
            android:id="@+id/listview1"
            android:layout_width="match_parent"
            android:layout height="wrap content"
            android:gravity="center" >
       </ListView>
    </RelativeLayout>
</RelativeLayout>
```

android:textSize="20sp"

然后是在res/layout中添加ListView显示的stu_item.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"</pre>
    android:layout width="match parent"
    android:layout height="match parent"
    android:orientation="horizontal" >
    <TextView
        android:id="@+id/stu id"
                android:layout width="wrap content"
                android:layout_height="wrap_content"
                android:layout weight="1"
                android:textSize="20sp" />
        <TextView
            android:id="@+id/stu name"
                android:layout_width="wrap_content"
                android:layout height="wrap content"
                android:layout_weight="1"
                android:textSize="20sp" />
        <TextView
            android:id="@+id/stu tel"
                android:layout width="wrap content"
                android:layout_height="wrap_content"
                android:layout weight="1"
                android:textSize="20sp" />
        <TextView
            android:id="@+id/stu height"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_weight="1"
                android:textSize="20sp" />
</LinearLayout>
```

再次,添加自定义类MySQLiteOpenHelper:

```
//添加自定义类 继承SQLiteOpenHelper
public class MySQLiteOpenHelper extends SQLiteOpenHelper {
       public Context mContext;
       //创建学生表(学号,姓名,电话,身高) 主键学号
       public static final String createTableStu = "create table Student (" +
                       "id integer primary key, " +
                       "name text, " +
                       "tel text, " +
                       "height real)";
       //抽象类 必须定义显示的构造函数 重写方法
       public MySQLiteOpenHelper(Context context, String name, CursorFactory factory,
                       int version) {
               super(context, name, factory, version);
               mContext = context;
       }
       @Override
       public void onCreate(SQLiteDatabase arg0) {
               // TODO Auto-generated method stub
               arg0.execSQL(createTableStu);
               Toast.makeText(mContext, "Created", Toast.LENGTH_SHORT).show();
       }
```

最后是MainActivity.java文件,代码如下:

```
public class MainActivity extends Activity {
       //继承SQLiteOpenHelper类
       private MySQLiteOpenHelper sqlHelper;
       private ListView listview;
       private EditText edit1;
       private EditText edit2;
       private EditText edit3;
       private EditText edit4;
       @Override
    protected void onCreate(Bundle savedInstanceState) {
       super.onCreate(savedInstanceState);
        setContentView(R.layout.activity main);
       sqlHelper = new MySQLiteOpenHelper(this, "StuDatabase.db", null, 2);
       //建立新表
       Button createBn = (Button) findViewById(R.id.button1);
       createBn.setOnClickListener(new OnClickListener() {
               @Override
               public void onClick(View v) {
                        sqlHelper.getWritableDatabase();
               }
       });
       //插入数据
       Button insertBn = (Button) findViewById(R.id.button2);
       edit1 = (EditText) findViewById(R.id.edit id);
       edit2 = (EditText) findViewById(R.id.edit_name);
       edit3 = (EditText) findViewById(R.id.edit tel);
       edit4 = (EditText) findViewById(R.id.edit height);
       insertBn.setOnClickListener(new OnClickListener() {
               @Override
               public void onClick(View v) {
                        SQLiteDatabase db = sqlHelper.getWritableDatabase();
                        ContentValues values = new ContentValues();
                        //插入第一组数据
                        values.put("id", "10001");
                        values.put("name", "Eastmount");
                        values.put("tel", "15201610000");
                        values.put("height", "172.5");
                        db.insert("Student", null, values);
                        values.put("id", edit1.getText().toString());
                        values.put("name", edit2.getText().toString());
                        values.put("tel", edit3.getText().toString());
                        values.put("height", edit4.getText().toString());
                        db.insert("Student", null, values);
                        Toast.makeText(MainActivity.this, "数据插入成功", Toast.LENGTH_SHORT).show();
                        edit1.setText("");
                        edit2.setText("");
```

```
edit4.setText("");
                               }
               });
               //删除数据
               Button deleteBn = (Button) findViewById(R.id.button3);
               deleteBn.setOnClickListener(new OnClickListener() {
                               @Override
                               public void onClick(View v) {
                                               SQLiteDatabase db = sqlHelper.getWritableDatabase();
                                               db.delete("Student", "height > ?", new String[] {"180"});
                                               Toast.makeText(MainActivity.this, "删除数据", Toast.LENGTH_SHORT).show();
                               }
               });
               //更新数据
               Button updateBn = (Button) findViewById(R.id.button4);
               updateBn.setOnClickListener(new OnClickListener() {
                               @Override
                               public void onClick(View v) {
                                               SQLiteDatabase db = sqlHelper.getWritableDatabase();
                                               ContentValues values = new ContentValues();
                                               values.put("height", "180");
                                               db.update("Student", values, "name = ?", new String[] {"XiaoMing"});
                                               Toast.makeText(MainActivity.this, "更新数据", Toast.LENGTH_SHORT).show();
                               }
               });
               //查询数据
               listview = (ListView) findViewById(R.id.listview1);
               Button selectBn = (Button) findViewById(R.id.button5);
               selectBn.setOnClickListener(new OnClickListener() {
                               @Override
                               public void onClick(View v) {
                                               trv {
                                                               SQLiteDatabase db = sqlHelper.getWritableDatabase();
                                                               //游标查询每条数据
                                                               Cursor cursor = db.query("Student", null, n
                                                               //定义list存储数据
                                                               List<Map<String, Object>> list = new ArrayList<Map<String, Object>>();
                                                               //适配器SimpleAdapter数据绑定
                                                               //错误:构造函数SimpleAdapter未定义 需把this修改为MainActivity.this
                                                               SimpleAdapter adapter = new SimpleAdapter(MainActivity.this, list,
R.layout.stu item,
                                                                                              new String[]{"id", "name", "tel", "height"},
                                                                                              new int[]{R.id.stu id, R.id.stu name, R.id.stu tel,
R.id.stu_height});
                                                               //读取数据 游标移动到下一行
                                                               while(cursor.moveToNext()) {
                                                                              Map<String, Object> map = new HashMap<String, Object>();
                                                                              map.put( "id", cursor.getString(cursor.getColumnIndex("id")) );
                                                                               map.put( "name", cursor.getString(cursor.getColumnIndex("name")) );
                                                                               map.put( "tel", cursor.getString(cursor.getColumnIndex("tel")) );
                                                                              map.put( "height", cursor.getString(cursor.getColumnIndex("height"))
);
                                                                               list.add(map):
                                                                                                                                                                           }
                                                                                                                                                                         }
                                                               listview.setAdapter(adapter);
                                               catch (Exception e){
                                                               Log.i("exception", e.toString());
                                                                                                                                                                                 }
                               }
               });
       }
}
```

edit3.setText("");

PS:希望文章对大家有所帮助,文章是关于SQLite的基础操作,而且没有涉及到数据库的触发器、存储过程、事务、索引等知识,网上也有很多相关的资料.同时现在有门课程《数据库高级技术与开发》,故作者当个在线笔记及基础讲解吧!这篇文章有一些不足之处,但作为基础文章还是不错的.

下载地址: http://download.csdn.net/detail/eastmount/8159881

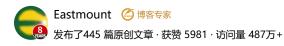
主要参考:

1.郭霖大神的《第一行代码Android》

2.android中的数据库操作 By:nieweilin

(By:Eastmount 2014-11-15 夜2点 http://blog.csdn.net/eastmount/)

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