Mobile Computing (CSE 40814/60814)

Topic: Using local and remote databases (SQL, Parse) for both Android and iOS

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   - 2.1. CoreData for iOS
   - 2.2. SQL Lite for Android
3. Remote databases (for both iOS and Android)
   - 3.1. Parse.com
   - 3.2. Remote Server (e.g. mysql)
4. Demos
5. Resources
6. Conclusion

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1. *Local databases (on the device)*

Core Data

Core Data is a schema-driven object graph management and persistence framework. Fundamentally, Core Data helps you to save model objects (in the sense of the model-view-controller design pattern) to a file and get them back again.

SQLite

SQLite is a relational database management system and is a popular choice for embedded systems (i.e. mobile devices)

“Android provides full support for SQLite databases.”

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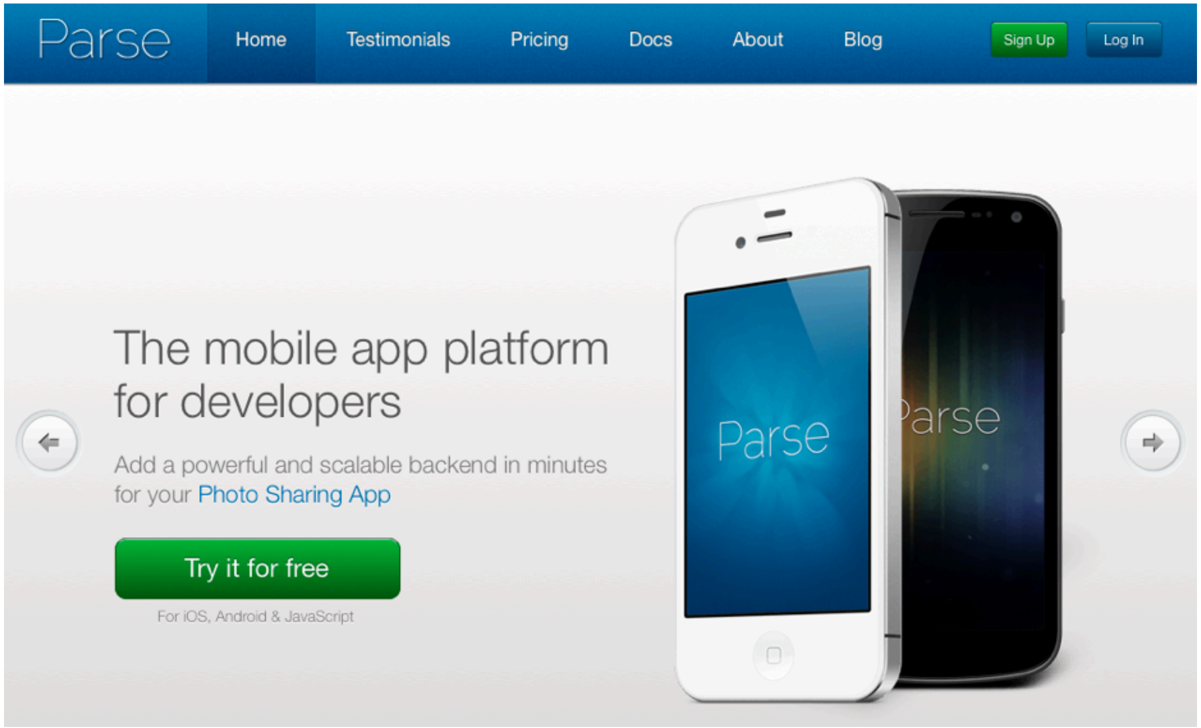
2. *Remote databases*

Remote Server

Parse.com



The mobile app platform for developers

Add a powerful and scalable backend in minutes for your Photo Sharing App

For iOS, Android & JavaScript

In Class Demo

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In-class Demos

1. Parse.com

Suitable for iOS & Android Projects

2. Remote Server

Suitable for iOS & Android Projects

3. iOS Core Data

Core Data Tutorial for iOS Getting Started

4. SQLite Android

Starting Point

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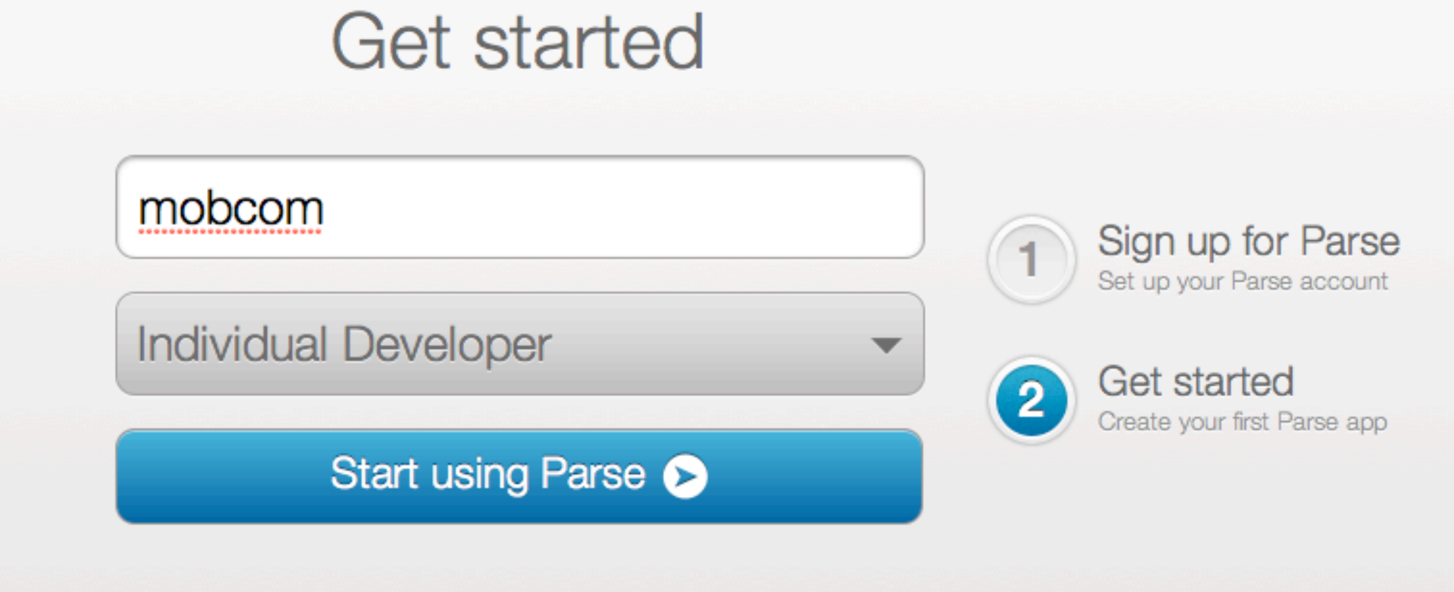
Parse.com

1 https://parse.com/apps/quickstart

2



Get started

mobcom

Individual Developer

Start using Parse

1 Sign up for Parse
Set up your Parse account

2 Get started
Create your first Parse app

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Parse on Android - Example/Demo

```
package com.parse.starter;

import com.parse.Parse;
import com.parse.ParseACL;

import com.parse.ParseUser;

import android.app.Application;

public class ParseApplication extends Application {

      @Override
      public void onCreate() {
            super.onCreate();

            // Add your initialization code here
            public void onCreate() {
                  Parse.initialize(this,
            "dU1yYjwjUQNykx8rX2nD1P7B6Ij3hnXMbeSCUx5i",
            "mVmevaUxuFh1xVkPlwaqCtZCD8heLIzbN92Y0vZc");
            }

            ParseUser.enableAutomaticUser();
            ParseACL defaultACL = new ParseACL();
            // Optionally enable public read access
            //      by default.

            // defaultACL.setPublicReadAccess(true);
            ParseACL.setDefaultACL(defaultACL, true);
      }

}
```

```
package com.parse.starter;

import com.parse.ParseObject;
import android.app.Activity;
import android.os.Bundle;
import android.view.View;
import android.view.View.OnClickListener;
import android.widget.Button;
import android.widget.Toast;

public class ParseStarterProjectActivity extends Activity implements
OnClickListener{
      /** Called when the activity is first created. */
      public void onCreate(Bundle savedInstanceState) {
            super.onCreate(savedInstanceState);
            setContentView(R.layout.main);

            Button tstBtn = (Button) findViewById(R.id.button1);
            tstBtn.setOnClickListener(this);
      }

      @Override
      public void onClick(View v) {
            // TODO Auto-generated method stub
            if (v.isPressed()){
                  Toast.makeText(v.getContext(), "Button Pressed",
                       Toast.LENGTH_SHORT).show();

                  ParseObject testObject = new ParseObject("TestObject");
                  testObject.put("Sal", "Rules!");
                  testObject.saveInBackground();
            }

      }
}
```

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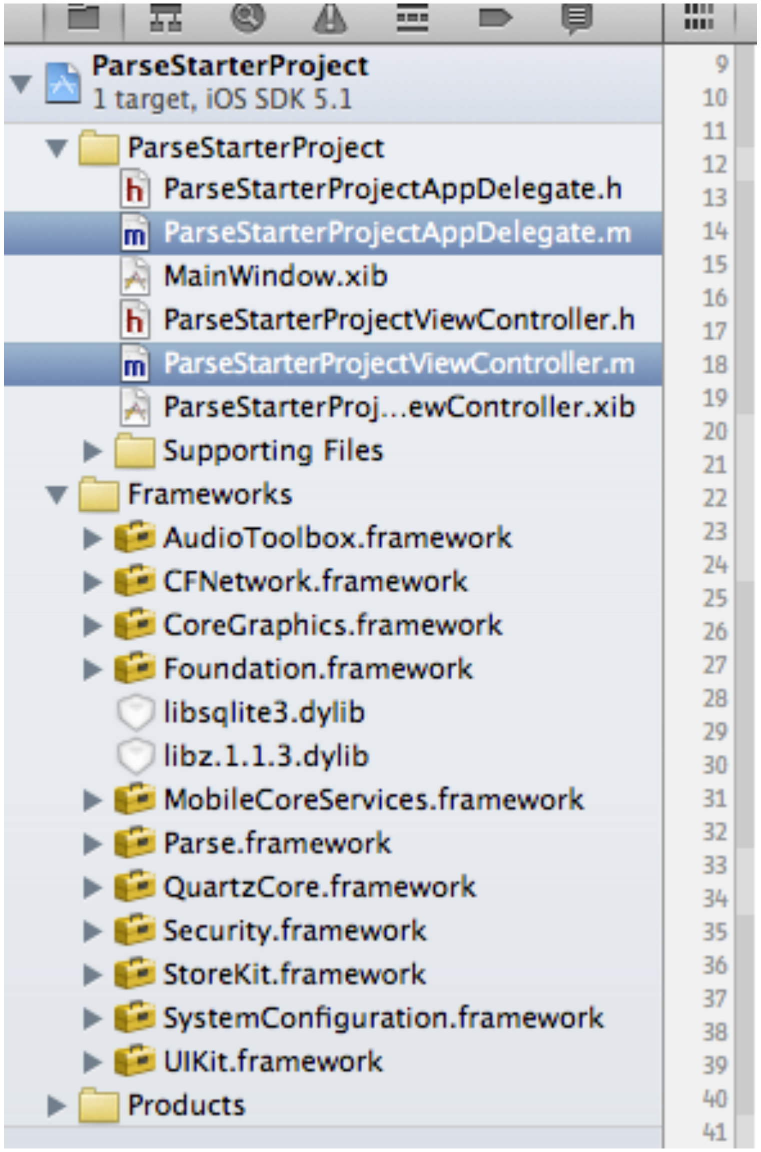
Parse for iOS - Example/Demo



ParseStarterProject
1 target, iOS SDK 5.1

- ParseStarterProject
  - ParseStarterProjectAppDelegate.h
  - ParseStarterProjectAppDelegate.m
  - MainWindow.xib
  - ParseStarterProjectViewController.h
  - ParseStarterProjectViewController.m
  - ParseStarterProj...ewController.xib
  - Supporting Files
- Frameworks
  - AudioToolbox.framework
  - CFNetwork.framework
  - CoreGraphics.framework
  - Foundation.framework
  - libsqlite3.dylib
  - libz.1.1.3.dylib
  - MobileCoreServices.framework
  - Parse.framework
  - QuartzCore.framework
  - Security.framework
  - StoreKit.framework
  - SystemConfiguration.framework
  - UIKit.framework
- Products

Changes to AppDelegate.m file

```
// Implement viewDidLoad to do additional setup after loading the
view, typically from a nib.
- (void)viewDidLoad
{
    [super viewDidLoad];
    PFObject *testObject = [PFObject
objectWithClassName:@"TestObject"];
    [testObject setObject:@"ios" forKey:@"foo"];
    [testObject save];

}
```

Changes to ViewController.m file

```
- (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:
(NSDictionary *)launchOptions
{
    // ****************************************************************************
    // Uncomment and fill in with your Parse credentials:
    // [Parse setApplicationId:@"your_application_id"
clientKey:@"your_client_key"];
    [Parse setApplicationId:@"dU1yYjwjUQNykx8rX2nD1P7B6Ij3hnXMbeSCUx5i"
                  clientKey:@"mVmevaUxuFh1xVkPlwaqCtZCD8heLIzbN92Y0vZc"];
    //
    // If you are using Facebook, uncomment and fill in with your Facebook App Id:
    // [PFFacebookUtils initializeWithApplicationId:@"your_facebook_app_id"];
    // ****************************************************************************
```

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2. Remote databases

1. Hosted on a server reachable over the internet
2. Configured and maintained as a service on a Windows or Linux system
3. Pushing/Fetching Data is typically done using PHP scripts
4. May be accessed on Android & iOS apps
5. The database engine is typically MySQL

Typically MySQL Powered

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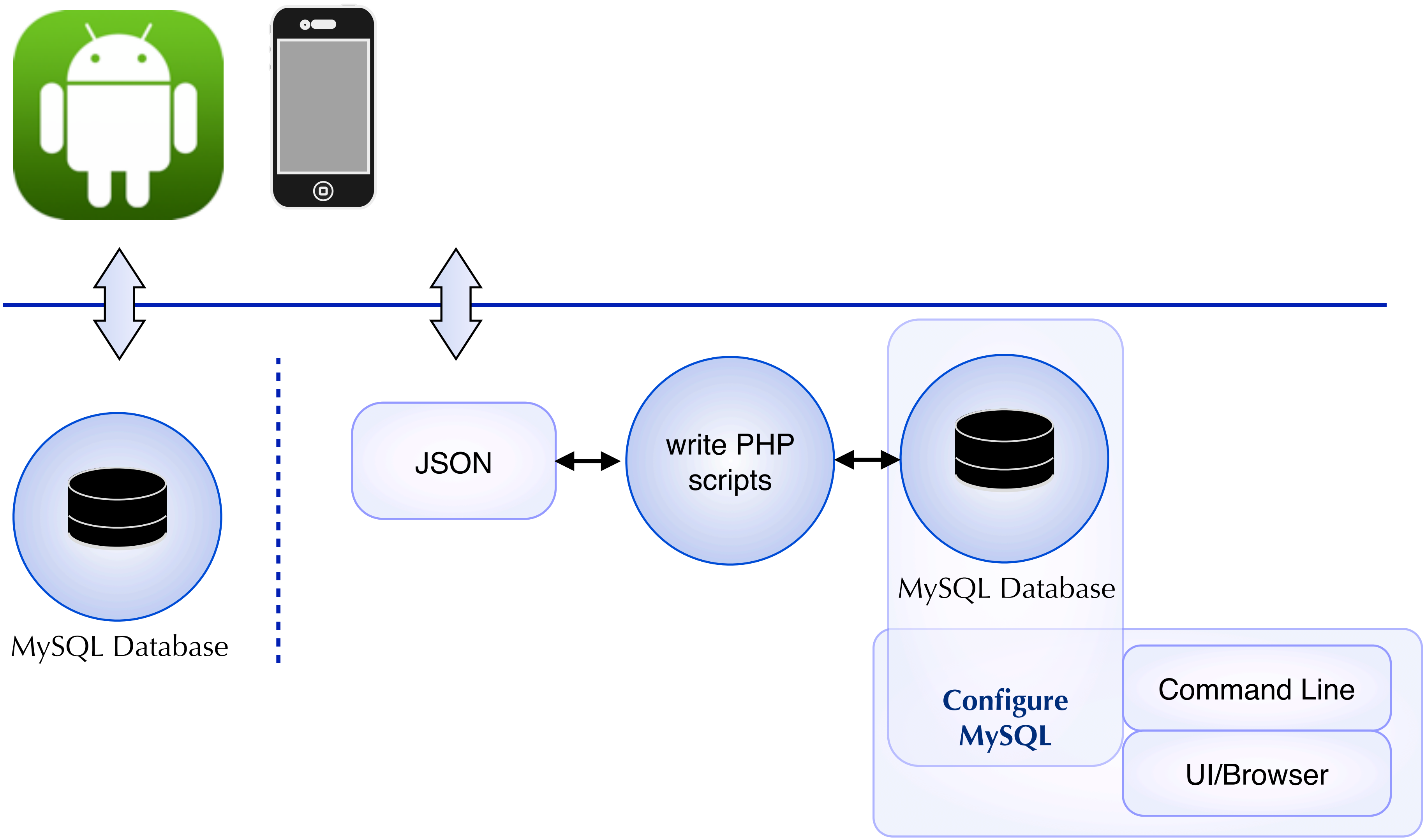
MySQL Database Demo



MySQL Database

JSON

write PHP scripts

MySQL Database

Configure MySQL

Command Line

UI/Browser

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MySQL Database Demo

Command Line

```
 mysql –u tremcam –p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 384
Server version: 5.1.52 Source distribution

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reserved.
This software comes with ABSOLUTELY NO WARRANTY. This is free
and you are welcome to modify and redistribute it under the GI

Type 'help;' or '\h' for help. Type '\c' to clear the current
statement.

mysql> use neurobit;
Reading table information for completion of table and column
You can turn off this feature to get a quicker startup with –

Database changed
mysql> describe TremCamTbl;
+-------------------+-------------+------+-----+---------+----
| Field             | Type        | Null | Key | Default | Ex
+-------------------+-------------+------+-----+---------+----
| subjectid         | int(10)     | NO   | PRI | NULL    | au
| email             | varchar(64) | YES  |     | NULL    |
| datetimestamp     | datetime    | YES  |     | NULL    |
| ctrl_tst_category | tinyint(1)  | YES  |     | NULL    |
| accelX            | mediumblob  | YES  |     | NULL    |
| accelY            | mediumblob  | YES  |     | NULL    |
| accelZ            | mediumblob  | YES  |     | NULL    |                |
| fft_result        | mediumblob  | YES  |     | NULL    |                |
+-------------------+-------------+------+-----+---------+----------------+
```
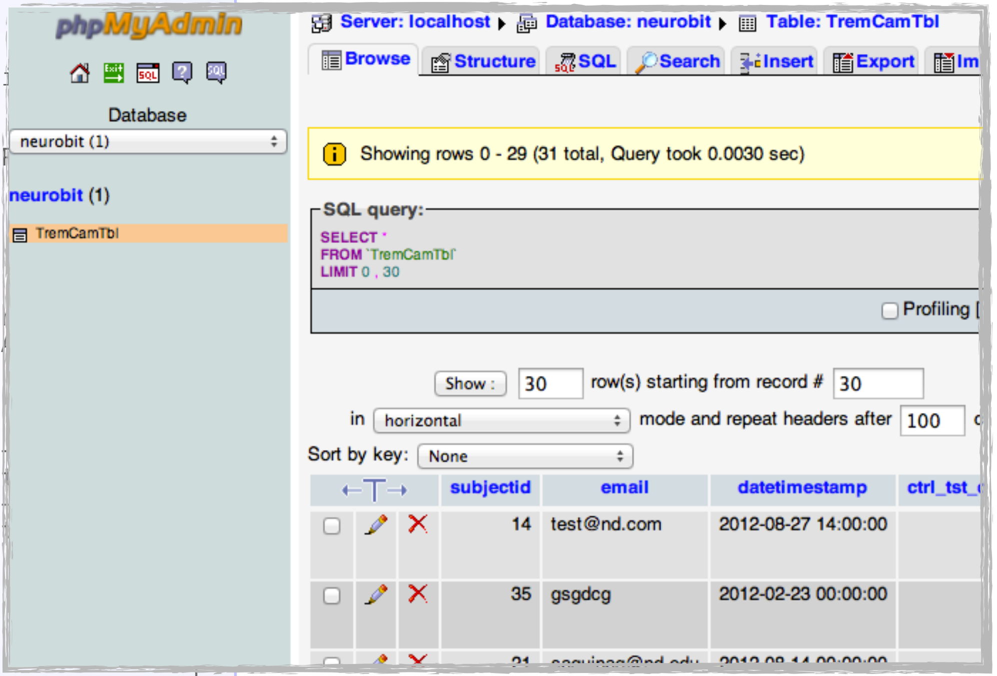

PhpMyAdmin (Browser)



Database: neurobit (1)

neurobit (1)

TremCamTbl

Server: localhost ▸ Database: neurobit ▸ Table: TremCamTbl

Showing rows 0 - 29 (31 total, Query took 0.0030 sec)

SQL query:

```
SELECT *
FROM `TremCamTbl`
LIMIT 0 , 30
```

□ Profiling [

Show : 30 row(s) starting from record # 30

in horizontal mode and repeat headers after 100 c

Sort by key: None

←T→			subjectid	email	datetimestamp	ctrl_tst_
□	✎	✗	14	test@nd.com	2012-08-27 14:00:00	
□	✎	✗	35	gsgdcg	2012-02-23 00:00:00	
□	✎	✗	21	saguinag@nd.edu	2012-08-14 00:00:00	

This is how to you design and maintain the database

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Resources

Download Tutorial Source Code

https://github.com/wndsword/mobcomtutorial/tree/AndroidMysql

https://github.com/wndsword/mobcomtutorial/tree/Docs