TD2/TP2
Programmation mobile
Les Bases d'Android

Exercice 1 : Méta modèle application

Compléter le méta-modèle d'une application Android, proposé dans le premier TD, pour ajouter les nouveaux concepts.

Exercice 2 : Modèle BD

Donner les éléments structurels liés à l'utilisation d'une Base de données en Android (Modèle structurel) ainsi que le processus de création (modèle d'activités).

Exercice 3 : Adapter - 1

Observer et analysez les listings ci-dessous et dites ce que l'application associée réalise.

Fichier: res/layout/list__fruit.xml

```
<?xml version="1.0" encoding="utf-8"?>
<TextView xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout__width="fill__parent"
    android:layout__height="fill__parent"
    android:padding="10dp"
    android:textSize="20sp" >
</TextView>
```

```
package com.mkyong.android;

import android.app.ListActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.widget.TextView;
import android.widget.Toast;
import android.widget.AdapterView.OnItemClickListener;

public class ListFruitActivity extends ListActivity {

    static final String[]FRUITS = new String[]{ "Apple", "Avocado",
"Banana",
            "Blueberry", "Coconut", "Durian", "Guava", "Kiwifruit",
            "Jackfruit", "Mango", "Olive", "Pear", "Sugar-apple" };

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

       //no more this
```

```
       //setContentView(R.layout.list__fruit);

        setListAdapter(new ArrayAdapter<String>(this,
R.layout.list__fruit,FRUITS));

        ListView listView = getListView();
        listView.setTextFilterEnabled(true);

        listView.setOnItemClickListener(new OnItemClickListener() {
            public void onItemClick(AdapterView<?> parent, View view,
                    int position, long id) {
               //When clicked, show a toast with the TextView text
                Toast.makeText(getApplicationContext(),
                ((TextView) view).getText(), Toast.LENGTH__SHORT).show();
            }
        });

    }

}
```

Exercice 4 : Adapter – 2

Observer et analysez les listings ci-dessous et dites ce que l'application associée réalise.

Fichier: res/layout/list__mobile.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout__width="wrap__content"
    android:layout__height="wrap__content"
    android:padding="5dp" >

    <ImageView
        android:id="@+id/logo"
        android:layout__width="50px"
        android:layout__height="50px"
        android:layout__marginLeft="5px"
        android:layout__marginRight="20px"
        android:layout__marginTop="5px"
        android:src="@drawable/windowsmobile__logo" >
    </ImageView>

    <TextView
        android:id="@+id/label"
        android:layout__width="wrap__content"
        android:layout__height="wrap__content"
        android:text="@+id/label"
        android:textSize="30px" >
    </TextView>

</LinearLayout>
```

```
package com.mkyong.android.adaptor;
```

```
import com.mkyong.android.R;

import android.content.Context;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.ArrayAdapter;
import android.widget.ImageView;
import android.widget.TextView;

public class MobileArrayAdapter extends ArrayAdapter<String> {
    private final Context context;
    private final String[]values;

    public MobileArrayAdapter(Context context, String[]values) {
        super(context, R.layout.list__mobile, values);
        this.context = context;
        this.values = values;
    }

    @Override
    public View getView(int position, View convertView, ViewGroup
parent) {
        LayoutInflater inflater = (LayoutInflater) context
            .getSystemService(Context.LAYOUT__INFLATER__SERVICE);

        View rowView = inflater.inflate(R.layout.list__mobile, parent,
false);
        TextView textView = (TextView)
rowView.findViewById(R.id.label);
        ImageView imageView = (ImageView)
rowView.findViewById(R.id.logo);
        textView.setText(values[position]);

       //Change icon based on name
        String s = values[position];

        System.out.println(s);

        if (s.equals("WindowsMobile")) {
            imageView.setImageResource(R.drawable.windowsmobile__logo);
        } else if (s.equals("iOS")) {
            imageView.setImageResource(R.drawable.ios__logo);
        } else if (s.equals("Blackberry")) {
            imageView.setImageResource(R.drawable.blackberry__logo);
        } else {
            imageView.setImageResource(R.drawable.android__logo);
        }

        return rowView;
    }
```

```
}
```

```
package com.mkyong.android;

import com.mkyong.android.adaptor.MobileArrayAdapter;
import android.app.ListActivity;
import android.os.Bundle;
import android.widget.ListView;
import android.widget.Toast;
import android.view.View;

public class ListMobileActivity extends ListActivity {

    static final String[]MOBILE__OS =
                new String[]{ "Android", "iOS", "WindowsMobile",
"Blackberry"};

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

        setListAdapter(new MobileArrayAdapter(this, MOBILE__OS));

    }

    @Override
    protected void onListItemClick(ListView l, View v, int position,
long id) {

       //get selected items
        String selectedValue = (String)
getListAdapter().getItem(position);
        Toast.makeText(this, selectedValue,
Toast.LENGTH__SHORT).show();

    }

}
```

Exercice 5 : Base de données 1

Observez et analysez le code ci-dessous et dites ce que l'application associée réalise.

```
public class Animal {

   private int id_animal;
   private String nom_animal;

   // Constructeur
   public Animal(int id,String nom) {
      this.id_animal=id;
      this.nom_animal=nom;
      }

   public int getId_animal() {
      return id_animal;
      }

   public void setId_animal(int id) {
      this.id_animal = id;
      }

   public String getNom_animal() {
      return nom_animal;
      }

   public void setNom_animal(String nom) {
      this.nom_animal = nom;
       }
```

```
import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;

public class AnimalManager {

   private static final String TABLE_NAME = "animal";
   public static final String KEY_ID_ANIMAL="id_animal";
   public static final String KEY_NOM_ANIMAL="nom_animal";
   public static final String CREATE_TABLE_ANIMAL = "CREATE TABLE "+TABLE_NAME+
      " (" +
      " "+KEY_ID_ANIMAL+" INTEGER primary key," +
      " "+KEY_NOM_ANIMAL+" TEXT" +
      ");";
   private MySQLite maBaseSQLite; // notre gestionnaire du fichier SQLite
   private SQLiteDatabase db;

   // Constructeur
   public AnimalManager(Context context)
      {
      maBaseSQLite = MySQLite.getInstance(context);
      }

   public void open()
```

```
        {
        //on ouvre la table en lecture/écriture
        db = maBaseSQLite.getWritableDatabase();
        }

    public void close()
        {
        //on ferme l'accès à la BDD
        db.close();
        }

    public long addAnimal(Animal animal) {
        // Ajout d'un enregistrement dans la table

        ContentValues values = new ContentValues();
        values.put(KEY_NOM_ANIMAL, animal.getNom_animal());

        // insert() retourne l'id du nouvel enregistrement inséré, ou -1 en cas d'erreur
        return db.insert(TABLE_NAME,null,values);
        }

    public int modAnimal(Animal animal) {
        // modification d'un enregistrement
        // valeur de retour : (int) nombre de lignes affectées par la requête

        ContentValues values = new ContentValues();
        values.put(KEY_NOM_ANIMAL, animal.getNom_animal());

        String where = KEY_ID_ANIMAL+" = ?";
        String[] whereArgs = {animal.getId_animal()+""};

        return db.update(TABLE_NAME, values, where, whereArgs);
        }

    public int supAnimal(Animal animal) {
        // suppression d'un enregistrement
        // valeur de retour : (int) nombre de lignes affectées par la clause WHERE, 0 sinon

        String where = KEY_ID_ANIMAL+" = ?";
        String[] whereArgs = {animal.getId_animal()+""};

        return db.delete(TABLE_NAME, where, whereArgs);
        }

    public Animal getAnimal(int id) {
        // Retourne l'animal dont l'id est passé en paramètre

        Animal a=new Animal(0,"");

        Cursor c = db.rawQuery("SELECT * FROM "+TABLE_NAME+" WHERE
"+KEY_ID_ANIMAL+"="+id, null);
        if (c.moveToFirst()) {
            a.setId_animal(c.getInt(c.getColumnIndex(KEY_ID_ANIMAL)));
            a.setNom_animal(c.getString(c.getColumnIndex(KEY_NOM_ANIMAL)));
            c.close();
            }
        return a;
        }
```

```
    public Cursor getAnimaux() {
        // sélection de tous les enregistrements de la table
        return db.rawQuery("SELECT * FROM "+TABLE_NAME, null);
        }

    } // class AnimalManager
```

```
import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;

public class MySQLite extends SQLiteOpenHelper {

    private static final String DATABASE_NAME = "db.sqlite";
    private static final int DATABASE_VERSION = 1;
    private static MySQLite sInstance;

    public static synchronized MySQLite getInstance(Context context) {
        if (sInstance == null) { sInstance = new MySQLite(context); }
        return sInstance;
        }

    private MySQLite(Context context) {
        super(context, DATABASE_NAME, null, DATABASE_VERSION);
        }

    @Override
    public void onCreate(SQLiteDatabase sqLiteDatabase) {
        // Création de la base de données
        // on exécute ici les requêtes de création des tables
        sqLiteDatabase.execSQL(AnimalManager.CREATE_TABLE_ANIMAL); // création table "animal"
        }

    @Override
    public void onUpgrade(SQLiteDatabase sqLiteDatabase, int i, int i2) {
        // Mise à jour de la base de données
        // méthode appelée sur incrémentation de DATABASE_VERSION
        // on peut faire ce qu'on veut ici, comme recréer la base :
        onCreate(sqLiteDatabase);
        }

    } // class MySQLite
```

```
AnimalManager m = new AnimalManager(this); // gestionnaire de la table "animal"
m.open(); // ouverture de la table en lecture/écriture

// insertion. L'id sera attribué automatiquement par incrément
m.addAnimal(new Animal(0,"maya"));

// modification du nom de l'animal dont l'id est 1
Animal a=m.getAnimal(1);
a.setNom_animal("toto");
```

```
m.modAnimal(a);

// suppression
m.supAnimal(a);

// Listing des enregistrements de la table
Cursor c = m.getAnimaux();
if (c.moveToFirst())
   {
   do {
      Log.d("test",
         c.getInt(c.getColumnIndex(AnimalManager.KEY_ID_ANIMAL)) + "," +
         c.getString(c.getColumnIndex(AnimalManager.KEY_NOM_ANIMAL))
         );
      }
   while (c.moveToNext());
   }
c.close(); // fermeture du curseur

// fermeture du gestionnaire
m.close();
```

Exercice 6 : Base de données -2

Observez et analysez le code ci-dessous et dites ce que l'application associée réalise.

Fichier welcome.xml:

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context="com.javarticles.android.DatePickerExample" >

    <TextView
        android:id="@+id/welcome"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="40dp"
        android:layout_marginTop="18dp"
        android:text="@string/welcome"
        android:textColor="@color/welcome_text_color"
        android:textSize="20sp" />

    <Spinner
        android:id="@+id/spinner_languages"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

</LinearLayout>
```

fichier strings.xml:

```
<?xml version="1.0" encoding="utf-8"?>

<resources>

    <string name="app_name">JavArticles</string>

    <string name="welcome">SQLite Example</string>

    <string name="lang_c">C</string>

    <string name="lang_c_plus">C++</string>

    <string name="lang_java">Java</string>

    <string name="lang_python">Python</string>

    <string name="lang_scala">Scala</string>

    <string name="lang_perl">Perl</string>

    <string name="lang_ruby">Ruby</string>

</resources>
```

```
package com.javarticles.android;

import java.util.ArrayList;
import java.util.List;

import android.content.Context;
import android.content.res.Resources;
import android.database.Cursor;
import android.database.SQLException;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;

import com.javarticles.android.database.DatabaseConstants;

public class SQLiteHelper extends SQLiteOpenHelper implements DatabaseConstants {
    private Resources resources;
    private SQLiteDatabase database;

    public static final int DB_VERSION = 2;

    public SQLiteHelper(Context context) {
        super(context, DB_NAME, null, DB_VERSION);        resources = context.getResources();
        openDatabase();
    }
```

```
    public void openDatabase() {
        try {
            this.database = getWritableDatabase();
        } catch (final SQLException se) {
            se.printStackTrace();
        }
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        db.execSQL("CREATE TABLE " + TABLE_LANG + "(" + COL_LANG_ID
                + " INTEGER PRIMARY KEY NOT NULL, " + " " + COL_LANG_NAME
                + " VARCHAR(50) NOT NULL);");
        insertLanguage(db, resources.getString(R.string.lang_java));
        insertLanguage(db, resources.getString(R.string.lang_perl));
        insertLanguage(db, resources.getString(R.string.lang_python));
        insertLanguage(db, resources.getString(R.string.lang_ruby));
        insertLanguage(db, resources.getString(R.string.lang_scala));
        insertLanguage(db, resources.getString(R.string.lang_c));
        insertLanguage(db, resources.getString(R.string.lang_c_plus));
    }

    private static void insertLanguage(SQLiteDatabase db, String language) {
        db.execSQL("INSERT INTO " + TABLE_LANG + " (" + COL_LANG_NAME
                + ") VALUES ('" + language + "');");
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
    }

    public List getLanguagesFromDb() {
        final String sqlQuery = "SELECT " + COL_LANG_ID + ", " + COL_LANG_NAME
                + " FROM " + TABLE_LANG + " ORDER BY "
                + COL_LANG_NAME;

        final Cursor cursor = this.database.rawQuery(sqlQuery, null);

        final List langList = new ArrayList();

        while (cursor.moveToNext()) {
            langList.add(cursor.getString(cursor.getColumnIndex(COL_LANG_NAME)));
        }
        cursor.close();
        return langList;
    }
}
```

```
package com.javarticles.android.database;

public interface DatabaseConstants {
    public static String DB_NAME = "sqlite_example.db";
    public static final String TABLE_LANG = "languages";
    public static final String COL_LANG_ID = "lang_id";
```

```
    public static final String COL_LANG_NAME = "lang_name";
}
```

```
package com.javarticles.android;

import android.app.Activity;
import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.Spinner;

public class MainActivity extends Activity {
    private Spinner spinnerLanguages;
    private SQLiteHelper sqLiteHelper;

    public void onCreate(final Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        sqLiteHelper= new SQLiteHelper(this);
        setContentView(R.layout.welcome);
        spinnerLanguages = (Spinner) findViewById(R.id.spinner_languages);

        spinnerLanguages.setAdapter(new ArrayAdapter(this,
android.R.layout.simple_spinner_item, sqLiteHelper.getLanguagesFromDb()));
        ((ArrayAdapter<?>)spinnerLanguages.getAdapter()).setDropDownViewRes
ource(android.R.layout.simple_spinner_dropdown_item);
    }
}
```