

Ex. No. 4 Android Application Development using Database

Aim: Develop a Product information application in Android that enables to perform CRUD operations on data stored in SQLite Database.

Layout Used: Linear Layout, Table Layout

Intents: Insert, Retrieve, Retrieve All, Update, Delete and Main

Code:

MainActivity.java:

```
package com.example.ex4;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
public class MainActivity extends AppCompatActivity {

    @Override

    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        final Database[] db = new Database[1];

        Button create = findViewById(R.id.create);
```

```
create.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        db[0] = new Database(MainActivity.this);  
    }  
});
```

```
Button insert = findViewById(R.id.insert);  
insert.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        Intent intent = new Intent(MainActivity.this, Insert.class);  
        startActivity(intent);  
    }  
});
```

```
Button delete = findViewById(R.id.delete);  
delete.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        Intent intent = new Intent(MainActivity.this, Delete.class);  
        startActivity(intent);  
    }  
});
```

```
Button retrieve = findViewById(R.id.read);  
retrieve.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        Intent intent = new Intent(MainActivity.this, Retrieve.class);  
        startActivity(intent);  
    }  
});
```

```

Button retrieveAll = findViewById(R.id.read_all);
retrieveAll.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Intent intent = new Intent(MainActivity.this, RetrieveAll.class);
        startActivity(intent);
    }
});

```

```

Button update = findViewById(R.id.update);
update.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Intent intent = new Intent(MainActivity.this, Update.class);
        startActivity(intent);
    }
});

```

```

    }
}

```

Database.java:

```

package com.example.ex4;

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

public class Database extends SQLiteOpenHelper {

    private static final String DB_NAME = "product";

```

```

private static final int DB_VERSION = 3;

private static final String TABLE_NAME = "prod";

private static final String ID_COL = "id";

private static final String NAME_COL = "name";

private static final String BRAND_COL = "brand";

private static final String DESC_COL = "desc";

private static final String PRICE_COL = "price";

public Database(Context context) {
    super(context, DB_NAME, null, DB_VERSION);
}

@Override
public void onCreate(SQLiteDatabase db) {

    String query = "CREATE TABLE " + TABLE_NAME + " ("
        + ID_COL + " INTEGER PRIMARY KEY, "
        + NAME_COL + " TEXT,"
        + BRAND_COL + " TEXT,"
        + DESC_COL + " TEXT,"
        + PRICE_COL + " TEXT)";

    // at last we are calling a exec sql
    // method to execute above sql query
    db.execSQL(query);
}

// this method is use to add new course to our sqlite database.

```

```
public void addProduct(String id,String name,String brand, String desc,  
String price) {
```

```
    // on below line we are creating a variable for  
    // our sqlite database and calling writable method  
    // as we are writing data in our database.  
    SQLiteDatabase db = this.getWritableDatabase();
```

```
    // on below line we are creating a  
    // variable for content values.  
    ContentValues values = new ContentValues();
```

```
    // on below line we are passing all values  
    // along with its key and value pair.  
    values.put(ID_COL,id);  
    values.put(NAME_COL, name);  
    values.put(BRAND_COL,brand);  
    values.put(DESC_COL, desc);  
    values.put(PRICE_COL, price);
```

```
    // after adding all values we are passing  
    // content values to our table.  
    db.insert(TABLE_NAME, null, values);
```

```
    // at last we are closing our  
    // database after adding database.  
    db.close();
```

```
}
```

```
public void deleteProduct(String id){  
    SQLiteDatabase db = this.getWritableDatabase();  
    db.delete(TABLE_NAME,ID_COL+"= ?",new String[]{id});  
}
```

```
public void updateProduct(String id,String price){
```

```

        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues values = new ContentValues();
        values.put(PRICE_COL, price);
        db.update(TABLE_NAME, values, ID_COL + "=?", new
String[]{String.valueOf(id)});
    }

    public Cursor retrieveAll(){
        SQLiteDatabase db = this.getReadableDatabase();
        return db.query(TABLE_NAME, null, null, null, null, null, null);
    }

    public Cursor retrieve(String id){
        SQLiteDatabase db = this.getReadableDatabase();
        String[] projection = {
            NAME_COL,
            BRAND_COL,
            DESC_COL,
            PRICE_COL
        };

        // Define the condition for retrieval (e.g., where id = ?)
        String selection = ID_COL + " = ?";
        String[] selectionArgs = { id };

        // Execute the query
        Cursor cursor = db.query(
            TABLE_NAME,      // Table name
            projection,        // Columns to return
            selection,          // Selection (WHERE
                                // clause) selectionArgs,          //
                                // Selection arguments null,          // Group by
                                // null,          // Having
                                // null          // Order by
        );

```

```

        // The cursor now contains the retrieved row(s)
        return cursor;
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int
newVersion) {
        // this method is called to check if the table exists already.
        db.execSQL("DROP TABLE IF EXISTS " + TABLE_NAME);
        onCreate(db);
    }
}

```

Insert.java:

```

package com.example.ex4;

import android.content.Intent;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import
android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.TextView;
import

androidx.appcompat.app.AppCompatActivity; public

class Insert extends AppCompatActivity {

    @Override

```

```
protected void onCreate(Bundle savedInstanceState){  
    super.onCreate(savedInstanceState);  
    setContentView(R.layout.insert);  
}
```



```

Button backi = findViewById(R.id.backi);
backi.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Intent intent = new Intent(Insert.this,MainActivity.class);
        startActivity(intent);
    }
});

```

```

Button submiti = findViewById(R.id.submiti);
submiti.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Database db = new Database(Insert.this);

```

```

        TextView textView = findViewById(R.id.idi);
        String id = textView.getText().toString();
        textView = findViewById(R.id.namei);
        String name = textView.getText().toString();

```

```

        RadioGroup radioGroup = findViewById(R.id.radioGroup);
        int selectedRadioButtonId =
radioGroup.getCheckedRadioButtonId();
        RadioButton selectedRadioButton =
findViewById(selectedRadioButtonId);
        String brand = selectedRadioButton.getText().toString();

```

```

        Log.d("Debug",brand);

```

```

        textView = findViewById(R.id.desci);
        String desc =
textView.getText().toString();
        Log.d("Debug",desc);

```

```

        textView = findViewById(R.id.pricei);
        String price =

```

```
textView.getText().toString();
```

```

        db.addProduct(id,name,brand,desc,price);
    }
});
}
}

```

Retrieve:

```

package com.example.ex4;

import android.content.Intent;
import android.database.Cursor;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class Retrieve extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState){
        super.onCreate(savedInstanceState);
        setContentView(R.layout.retrieve);

        Button backr = findViewById(R.id.backr);
        backr.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent intent = new Intent(Retrieve.this,MainActivity.class);
                startActivity(intent);
            }
        });
    }
}

```

```

Button retrieve = findViewById(R.id.retrieve);
retrieve.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        TextView textView = findViewById(R.id.idr);
        String id = textView.getText().toString();

        Database db = new Database(Retrieve.this);
        Cursor cursor = db.retrieve(id);
        String name="",brand="",desc="",price="";

        if (cursor.moveToFirst()) {

            do {
                // Retrieve values from 'column1' and 'column2' as strings
                int columnIndex = cursor.getColumnIndex("name");
                if (columnIndex != -1) {
                    name = cursor.getString(columnIndex);
                }

                columnIndex = cursor.getColumnIndex("brand");
                if(columnIndex!=-1){
                    brand=cursor.getString(columnIndex);
                }

                columnIndex =
                cursor.getColumnIndex("desc");
                if(columnIndex!=-1){
                    desc=cursor.getString(columnIndex);
                }

                columnIndex =
                cursor.getColumnIndex("price");
                if(columnIndex!=-1){
                    price=cursor.getString(columnIndex);
                }
            } while (cursor.moveToNext());
        }
    }
});

```

}

```

        } while (cursor.moveToNext());
    }

    textView = findViewById(R.id.namer);
    textView.setText(name);

    textView = findViewById(R.id.brandr);
    textView.setText(brand);

    textView = findViewById(R.id.descr);
    textView.setText(desc);

    textView = findViewById(R.id.pricer);
    textView.setText(price);

    }
    });
}
}

```

Retrieve All:

```

package com.example.ex4;

import android.content.Context;
import android.content.Intent;
import android.database.Cursor;
import android.graphics.Color;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.TableLayout;
import android.widget.TableRow;

```

```

import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;
import androidx.constraintlayout.widget.ConstraintLayout;
import androidx.constraintlayout.widget.ConstraintSet;

import org.w3c.dom.Text;
public class RetrieveAll extends AppCompatActivity {
    private TextView newTextView(String text){
        TextView tv = new TextView(RetrieveAll.this);

        tv.setText(text);
        tv.setPadding(4,4,4,4);
        tv.setTextSize(24);
        TableRow.LayoutParams layoutParams = new
TableRow.LayoutParams(
            TableRow.LayoutParams.WRAP_CONTENT, // Adjust width as
needed                TableRow.LayoutParams.WRAP_C
CONTENT // Adjust height as
needed
        );

        layoutParams.rightMargin = 20;
        tv.setLayoutParams(layoutParams);

        return tv;
    }

    @Override
    protected void onCreate(Bundle savedInstanceState){
        super.onCreate(savedInstanceState);
        setContentView(R.layout.retrieve_all);

        Database db = new Database(RetrieveAll.this);

```

```
Cursor cursor = db.retrieveAll();

ConstraintLayout parent = findViewById(R.id.parent);

// Create layout params for the TableLayout
//     ConstraintLayout.LayoutParams tableLayoutParams = new
ConstraintLayout.LayoutParams(
//         ConstraintLayout.LayoutParams.MATCH_PARENT,
//         ConstraintLayout.LayoutParams.MATCH_PARENT
//     );
//     tableLayoutParams.startToStart =
ConstraintLayout.LayoutParams.PARENT_ID
;
//     tableLayoutParams.endToEnd =
ConstraintLayout.LayoutParams.PARENT_ID
;
//     tableLayoutParams.topToTop =
ConstraintLayout.LayoutParams.PARENT_ID
;
//     tableLayoutParams.bottomToBottom =
ConstraintLayout.LayoutParams.PARENT_ID
;
;
```

```
TableLayout tl = new TableLayout(RetrieveAll.this);
```

```
TableRow trh = new TableRow(RetrieveAll.this);
TextView tv0 = new TextView("Id");
trh.addView(tv0);
```

```
tv0 = new TextView("Name");
trh.addView(tv0);
```

```
tv0 = new TextView("Brand");
trh.addView(tv0);
```

```
tv0 = new TextView("Description");
```



```
trh.addView(tv0);
```

```
tv0 = newTextView("Price");
```

```
trh.addView(tv0);
```

```
tl.addView(trh);
```

```
String id="",name="",brand="",desc="",price="";
```

```
if (cursor.moveToFirst()) {
```

```
    do {
```

```
        // Retrieve values from 'column1' and 'column2' as strings
```

```
        int columnIndex = cursor.getColumnIndex("id");
```

```
        if (columnIndex != -1) {
```

```
            id = cursor.getString(columnIndex);
```

```
        }
```

```
        columnIndex =
```

```
        cursor.getColumnIndex("name");
```

```
        if(columnIndex!=-1){
```

```
            name=cursor.getString(columnIndex);
```

```
        }
```

```
        columnIndex =
```

```
        cursor.getColumnIndex("brand");
```

```
        if(columnIndex!=-1){
```

```
            brand=cursor.getString(columnIndex);
```

```
        }
```

```
        columnIndex =
```

```
        cursor.getColumnIndex("desc");
```

```
        if(columnIndex!=-1){
```

```
            desc=cursor.getString(columnIndex);
```

```
        }
```

```
        columnIndex =
```

```
        cursor.getColumnIndex("price");
```

```
        if(columnIndex!=-1){
```

```
            price=cursor.getString(columnIndex);
```

```
        }
```

```
Log.d("Debug",id+" "+name+" "+brand+" "+desc+" "+price);
```

```

        TableRow tr = new TableRow(RetrieveAll.this);

        TextView tv1 = new TextView(id);
        TextView tv2 = new TextView(name);
        TextView tv3 = new TextView(brand);
        TextView tv4 = new TextView(desc);
        TextView tv5 = new TextView(price);

        tr.addView(tv1)
        ;
        tr.addView(tv2)
        ;
        tr.addView(tv3)
        ;
        tr.addView(tv4)
        ;
        tr.addView(tv5)
        ;

        tl.addView(tr);

    } while (cursor.moveToNext());
}

parent.addView(tl);

//    app:layout_constraintEnd_toEndOf="parent"
//    app:layout_constraintStart_toStartOf="parent"
//    app:layout_constraintTop_toTopOf="parent"

Button retrieveAll = findViewById(R.id.backra);
retrieveAll.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Intent intent = new Intent(RetrieveAll.this,MainActivity.class);

```

```
        startActivity(intent);  
    }  
});
```

```
}  
}
```

Update:

```
package com.example.ex4;  
  
import android.content.Intent;  
import android.os.Bundle;  
import android.view.View;  
import android.widget.Button;  
import  
android.widget.TextView;  
import androidx.appcompat.app.AppCompatActivity;  
  
public class Update extends AppCompatActivity {  
  
    @Override  
    protected void onCreate(Bundle savedInstanceState){  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.update);  
  
        Button backu = findViewById(R.id.backu);  
        backu.setOnClickListener(new View.OnClickListener() {  
            @Override  
            public void onClick(View v) {  
                Intent intent = new Intent(Update.this,MainActivity.class);  
                startActivity(intent);  
            }  
        });  
  
        Button update = findViewById(R.id.update);  
        update.setOnClickListener(new View.OnClickListener() {
```

@Override

```

        public void onClick(View v) {
            Database db = new Database(Update.this);
            TextView textView =
                findViewById(R.id.idu); String id =
                textView.getText().toString(); textView =
                findViewById(R.id.priceu); String price =
                textView.getText().toString();

            db.updateProduct(id,price);
        }
    });
}
}

```

Delete.java:

```

package com.example.ex4;

import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import
android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class Delete extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState){
        super.onCreate(savedInstanceState);
        setContentView(R.layout.delete);

        Button backd = findViewById(R.id.backd);
        backd.setOnClickListener(new View.OnClickListener() {

```



```
@Override  
public void onClick(View v) {
```

```

        Intent intent = new
        Intent(Delete.this,MainActivity.class);
        startActivity(intent);
    }
});

Button delete = findViewById(R.id.delete);
delete.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Database db = new Database(Delete.this);

        TextView textView = findViewById(R.id.idd);
        String id = textView.getText().toString();

        db.deleteProduct(id);
    }
});
}
}

```

Activity_main.xml:

```

<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <RelativeLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent">

```

<!-- Center the LinearLayout vertically -->

<LinearLayout

 android:id="@+id/verticalLayout"
 android:layout_width="wrap_content"
 android:layout_height="wrap_content"
 android:layout_centerInParent="true"
 android:orientation="vertical">

<!-- Add your UI elements within this LinearLayout -->

<Button

 android:id="@+id/create"
 android:layout_width="177dp"
 android:layout_height="62dp"
 android:text="Create" />

<Button

 android:id="@+id/insert"
 android:layout_width="177dp"
 android:layout_height="62dp"
 android:text="Insert" />

<Button

 android:id="@+id/read"
 android:layout_width="match_parent"
 android:layout_height="wrap_content"
 android:text="Retrieve" />

<Button

 android:id="@+id/read_all"
 android:layout_width="match_parent"
 android:layout_height="wrap_content"
 android:text="Retrieve All" />

<Button

```
    android:id="@+id/update"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Update" />
```

```
<Button
    android:id="@+id/delete"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Delete" />
```

```
<!-- Add more views here as needed -->
```

```
</LinearLayout>
</RelativeLayout>
```

```
</androidx.constraintlayout.widget.ConstraintLayout>
```

Insert.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <LinearLayout
        android:layout_width="409dp"
        android:layout_height="665dp"
        android:layout_marginTop="50dp"
        android:orientation="vertical"
        app:layout_constraintBottom_toBottomOf="parent"
```

```
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent">
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="87dp"
    android:orientation="horizontal">
```

```
<TextView
    android:id="@+id/textView3"
    android:layout_width="120dp"
    android:layout_height="55dp"
    android:layout_weight="1"
    android:text="Product Id"
    android:textSize="24sp" />
```

```
<EditText
    android:id="@+id/idi"
    android:layout_width="wrap_content"
    android:layout_height="58dp"
    android:layout_weight="1"
    android:ems="10"
    android:inputType="textPersonName"
    " android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="84dp"
    android:orientation="horizontal">
```

```
<TextView
    android:id="@+id/textView5"
    android:layout_width="131dp"
    android:layout_height="58dp"
```

```
android:layout_weight="1"
android:text="Product Name"
android:textSize="24sp" />
```

```
<EditText
    android:id="@+id/namei"
    android:layout_width="wrap_content"
    android:layout_height="59dp"
    android:layout_weight="1"
    android:ems="10"
    android:inputType="textPersonName"
    android:textSize="24sp" />
</LinearLayout>
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="94dp"
    android:orientation="horizontal">
```

```
<TextView
    android:id="@+id/textView6"
    android:layout_width="198dp"
    android:layout_height="71dp"
    android:layout_weight="1"
    android:text="Brand"
    android:textSize="24sp" />
```

```
<RadioGroup
    android:id="@+id/radioGroup"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_weight="1" >
```

```
<RadioButton
    android:id="@+id/radio1"
```

```
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:textSize="24sp"
    android:text="A" />
```

```
<RadioButton
    android:id="@+id/radio2"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:textSize="24sp"
    android:text="B" />
```

```
</RadioGroup>
```

```
</LinearLayout>
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="93dp"
    android:orientation="horizontal">
```

```
<TextView
    android:id="@+id/textView7"
    android:layout_width="146dp"
    android:layout_height="73dp"
    android:layout_weight="1"
    android:text="Description"
    android:textSize="24sp" />
```

```
<EditText
    android:id="@+id/desci"
    android:layout_width="wrap_content"
    android:layout_height="75dp"
    android:layout_weight="1"
    android:ems="10"
    android:inputType="textPersonName"
    "
```

```
        android:textSize="24sp" />
</LinearLayout>
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="96dp"
    android:orientation="horizontal">
```

```
    <TextView
        android:id="@+id/textView8"
        android:layout_width="114dp"
        android:layout_height="79dp"
        android:layout_weight="1"
        android:text="Price"
        android:textSize="24sp" />
```

```
    <EditText
        android:id="@+id/pricei"
        android:layout_width="wrap_content"
        android:layout_height="82dp"
        android:layout_weight="1"
        android:ems="10"
        android:inputType="textPersonName"
        " android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<Button
    android:id="@+id/submiti"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Submit" />
```

```
<Button
    android:id="@+id/backi"
    android:layout_width="match_parent"
```



```
        android:layout_height="wrap_content"
        android:text="Back" />
```

```
    </LinearLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

Retrieve.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
```

```
    <LinearLayout
        android:id="@+id/linearLayout"
        android:layout_width="414dp"
        android:layout_height="203dp"
        android:orientation="vertical"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="1.0"
        app:layout_constraintStart_toStartOf="parent"
        tools:ignore="MissingConstraints"
        tools:layout_editor_absoluteY="-2dp">
```

```
        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="103dp"
            android:orientation="horizontal">
```

```
            <TextView
                android:id="@+id/textView"
                android:layout_width="144dp"
```

```
    android:layout_height="64dp"
    android:layout_weight="1"
    android:text="Product Id"
    android:textSize="24sp" />
```

```
<EditText
    android:id="@+id/idr"
    android:layout_width="wrap_content"
    android:layout_height="83dp"
    android:layout_weight="1"
    android:ems="10"
    android:inputType="textPersonName"
    " android:textSize="24sp" />
</LinearLayout>
```

```
<Button
    android:id="@+id/retrieve"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Retrieve" />
```

```
<Button
    android:id="@+id/backr"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Back" />
</LinearLayout>
```

```
<LinearLayout
    android:layout_marginTop="50dp"
    android:layout_width="411dp"
    android:layout_height="459dp"
    android:orientation="vertical"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintStart_toStartOf="parent"
```

```
app:layout_constraintTop_toBottomOf="@+id/linearLayout">
```

```
<LinearLayout  
    android:layout_width="match_parent"  
    android:layout_height="84dp"  
    android:orientation="horizontal">
```

```
<TextView  
    android:id="@+id/textView5"  
    android:layout_width="131dp"  
    android:layout_height="58dp"  
    android:layout_weight="1"  
    android:text="Product Name"  
    android:textSize="24sp" />
```

```
<TextView  
    android:id="@+id/namer"  
    android:layout_width="146dp"  
    android:layout_height="73dp"  
    android:layout_weight="1"  
    android:text=""  
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<LinearLayout  
    android:layout_width="match_parent"  
    android:layout_height="94dp"  
    android:orientation="horizontal">
```

```
<TextView  
    android:id="@+id/textView6"  
    android:layout_width="198dp"  
    android:layout_height="71dp"  
    android:layout_weight="1"  
    android:text="Brand"
```

```
android:textSize="24sp" />
```

```
<TextView  
    android:id="@+id/brandr"  
    android:layout_width="146dp"  
    android:layout_height="73dp"  
    android:layout_weight="1"  
    android:text=""  
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<LinearLayout  
    android:layout_width="match_parent"  
    android:layout_height="93dp"  
    android:orientation="horizontal">
```

```
<TextView  
    android:id="@+id/textView0"  
    android:layout_width="146dp"  
    android:layout_height="73dp"  
    android:layout_weight="1"  
    android:text="Description"  
    android:textSize="24sp" />
```

```
<TextView  
    android:id="@+id/descr"  
    android:layout_width="146dp"  
    android:layout_height="73dp"  
    android:layout_weight="1"  
    android:text=""  
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<LinearLayout
```

```
android:layout_width="match_parent"
android:layout_height="96dp"
android:orientation="horizontal">
```

```
<TextView
    android:id="@+id/textView8"
    android:layout_width="114dp"
    android:layout_height="79dp"
    android:layout_weight="1"
    android:text="Price"
    android:textSize="24sp" />
```

```
<TextView
    android:id="@+id/pricer"
    android:layout_width="146dp"
    android:layout_height="73dp"
    android:layout_weight="1"
    android:text=""
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
</LinearLayout>
```

```
</androidx.constraintlayout.widget.ConstraintLayout>
```

Retrieve All:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:id="@+id/parent">
```

```
<Button
    android:id="@+id/backra"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Back"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent" />
```

```
</androidx.constraintlayout.widget.ConstraintLayout>
```

Update.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
```

```
<LinearLayout
    android:layout_width="412dp"
    android:layout_height="352dp"
    android:orientation="vertical"
    app:layout_constraintStart_toStartOf="parent"
    tools:layout_editor_absoluteY="186dp"
    tools:ignore="MissingConstraints">
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="107dp"
```

```
android:orientation="horizontal">
```

```
<TextView  
    android:id="@+id/textView2"  
    android:layout_width="105dp"  
    android:layout_height="80dp"  
    android:layout_weight="1"  
    android:textSize="24sp"  
    android:text="Product Id" />
```

```
<EditText  
    android:id="@+id/idu"  
    android:layout_width="wrap_content"  
    android:layout_height="match_parent"  
    android:layout_weight="1"  
    android:ems="10"  
    android:inputType="textPersonName"  
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<LinearLayout  
    android:layout_width="match_parent"  
    android:layout_height="97dp"  
    android:orientation="horizontal">
```

```
<TextView  
    android:id="@+id/textView4"  
    android:layout_width="108dp"  
    android:layout_height="79dp"  
    android:layout_weight="1"  
    android:textSize="24sp"  
    android:text="Price" />
```

```
<EditText  
    android:id="@+id/priceu"
```

```

        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:layout_weight="1"
        android:ems="10"
        android:textSize="24sp"
        android:inputType="textPersonName" />
</LinearLayout>

<Button
    android:id="@+id/update"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Update" />

<Button
    android:id="@+id/backu"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Back" />
</LinearLayout>
</androidx.constraintlayout.widget.ConstraintLayout>

```

Delete.xml:

```

<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <LinearLayout
        android:layout_width="414dp"
        android:layout_height="475dp"

```



```
android:orientation="vertical"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
tools:layout_editor_absoluteY="101dp"
tools:ignore="MissingConstraints">
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="152dp"
    android:orientation="horizontal">
```

```
<TextView
    android:id="@+id/textView"
    android:layout_width="144dp"
    android:layout_height="89dp"
    android:layout_weight="1"
    android:textSize="24sp"
    android:text="Product Id" />
```

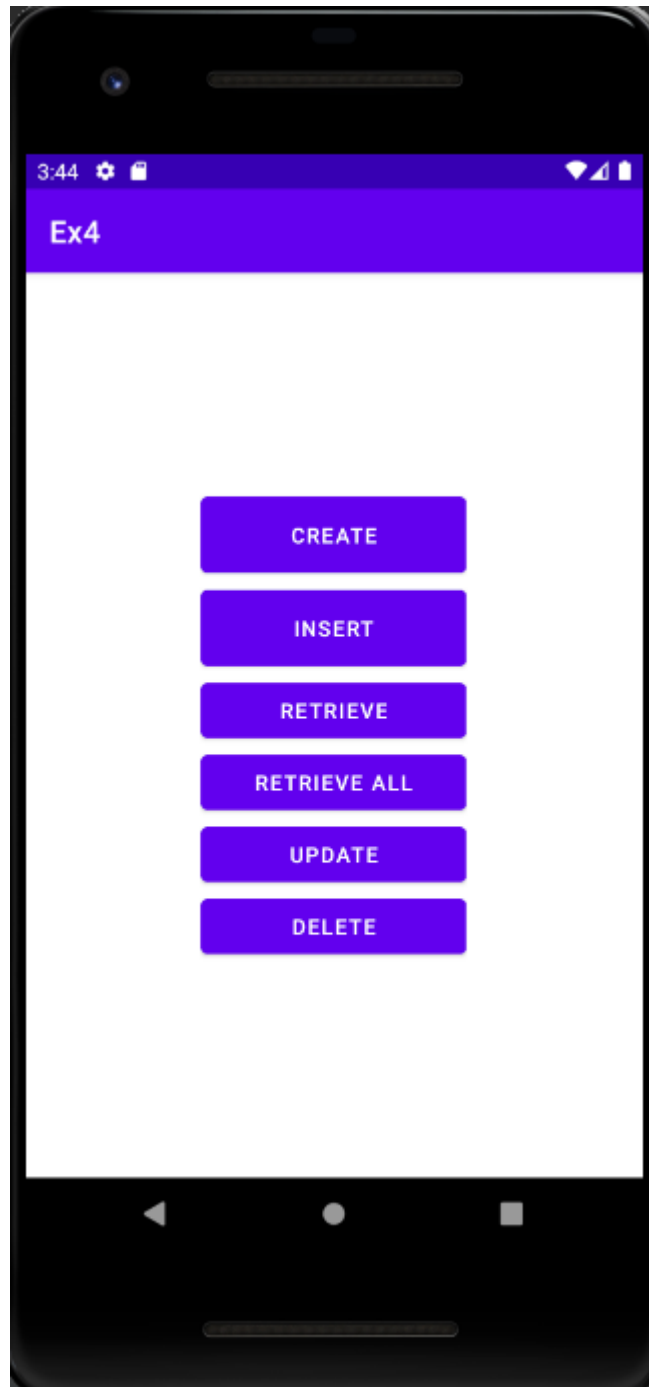
```
<EditText
    android:id="@+id/idd"
    android:layout_width="wrap_content"
    android:layout_height="match_parent"
    android:layout_weight="1"
    android:ems="10"
    android:inputType="textPersonName"
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<Button
    android:id="@+id/delete"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Delete" />
```

```
<Button
    android:id="@+id/backd"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Back" />
</LinearLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

Output:



3:44

Ex4

Product Id 4

Product Name zxcv

Brand ☒ A ☐ B

Description cool

Price 4567

SUBMIT

BACK

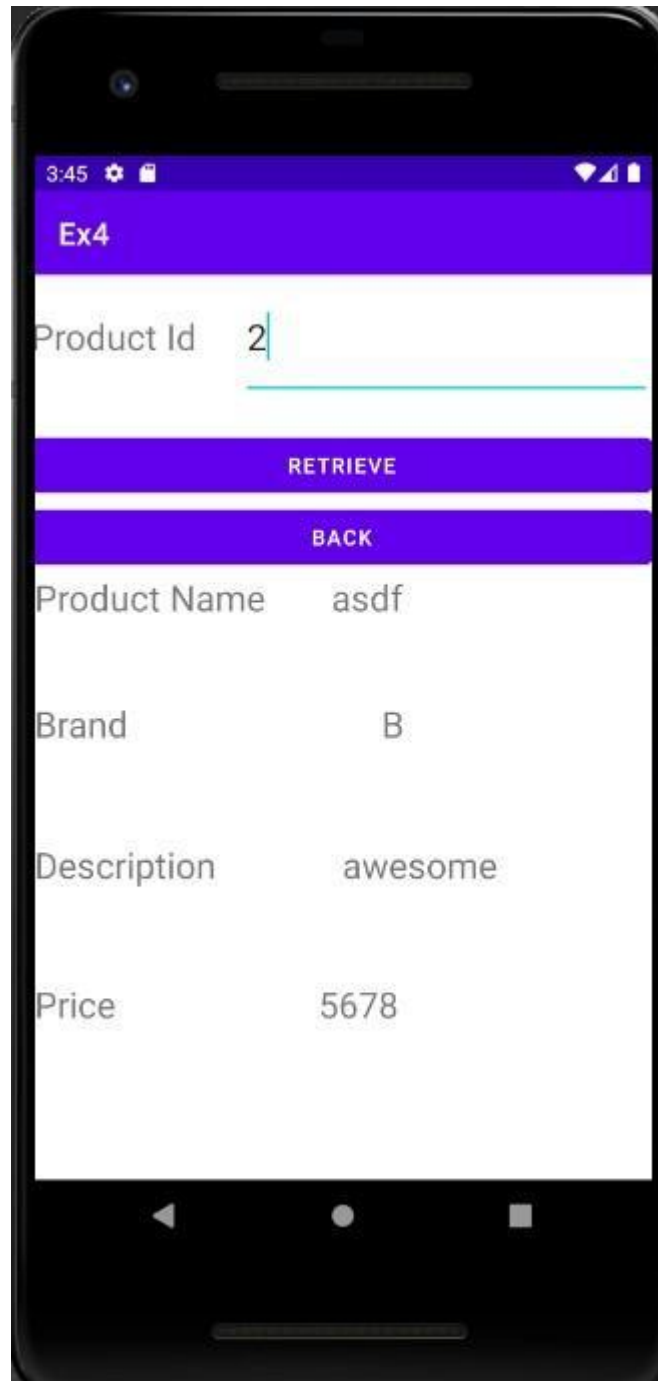
3:44

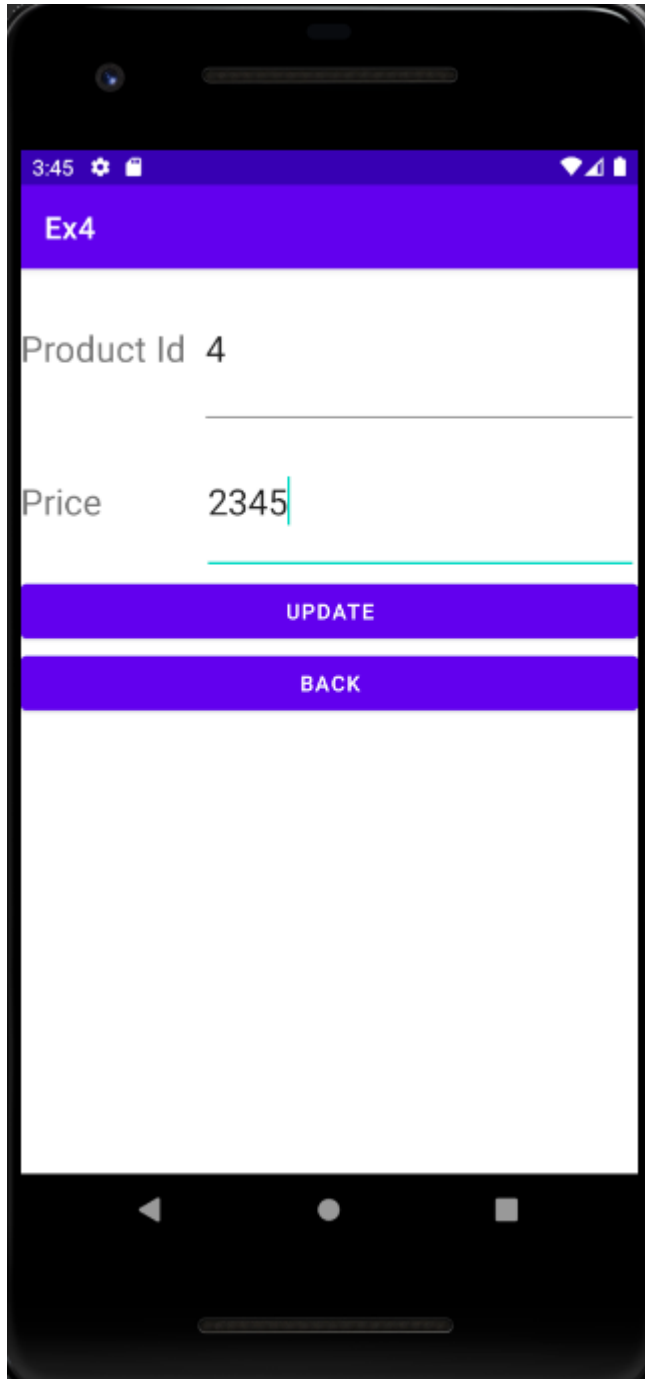


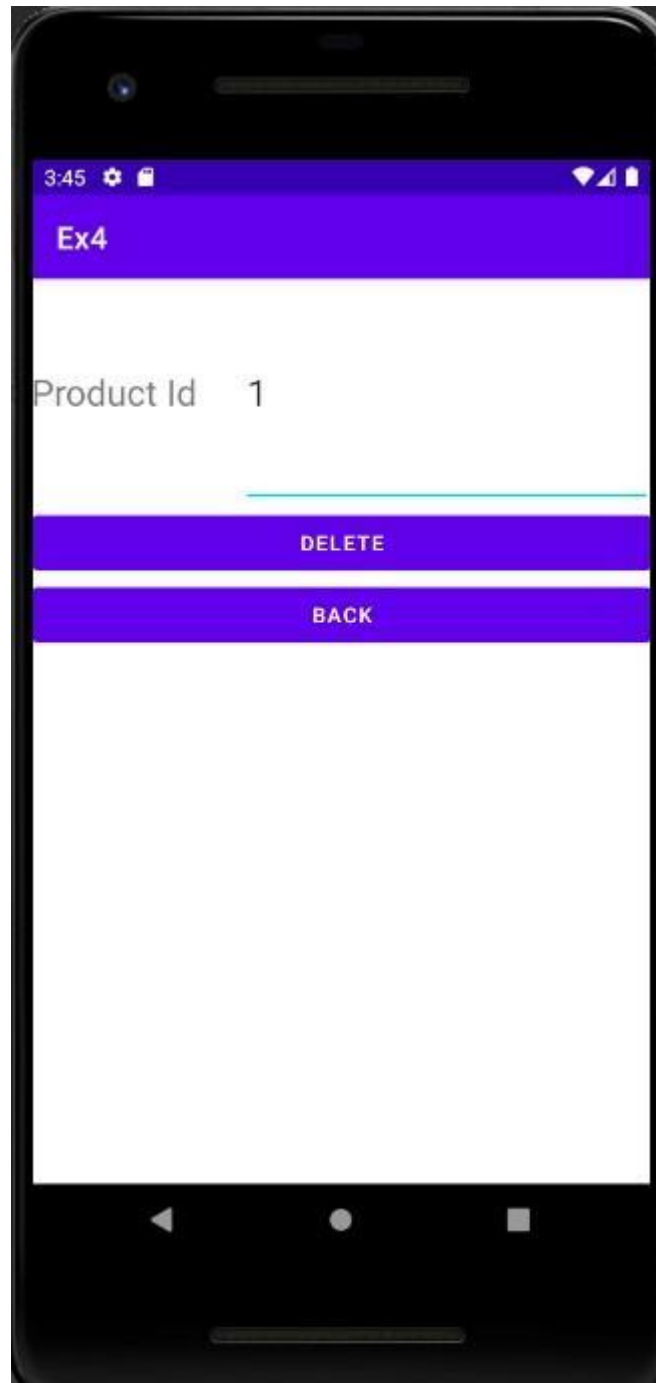
Ex4

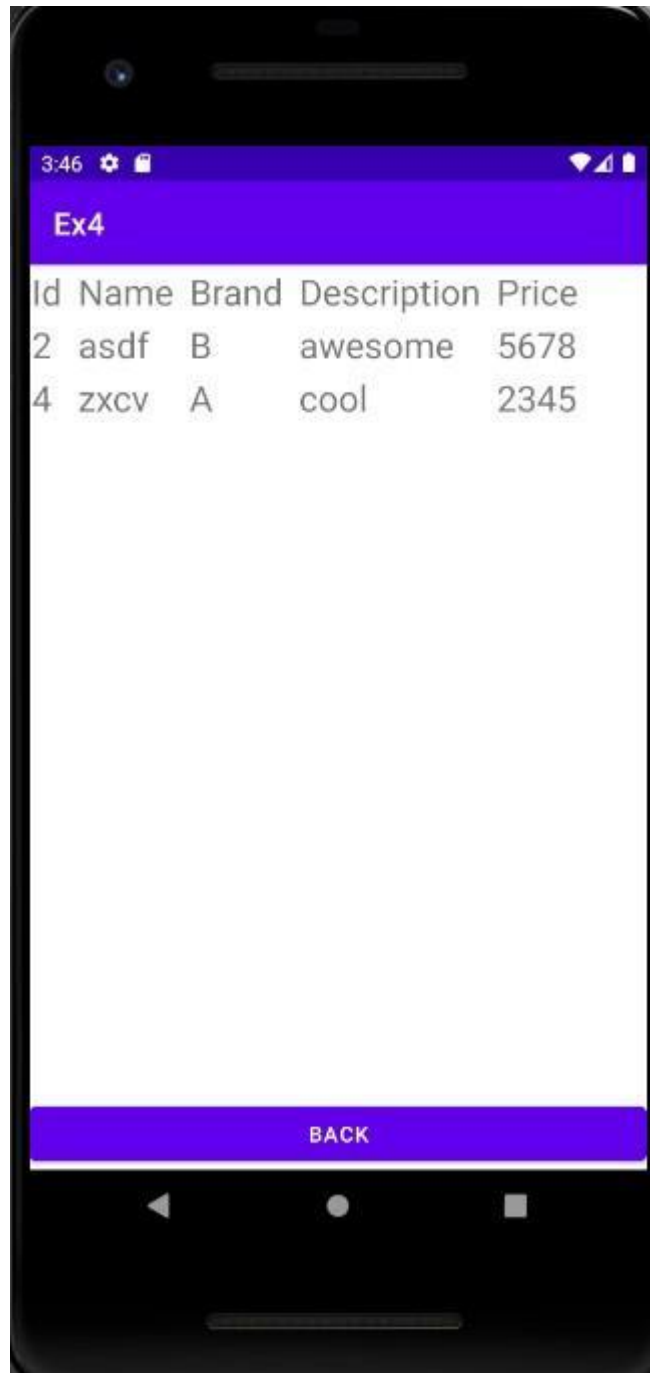
Id	Name	Brand	Description	Price
1	qwer	A	nice	1234
2	asdf	B	awesome	5678
4	zxcv	A	cool	4567

BACK









Best Practices:

- Used apt names for xml and java files.
- Set padding and margins for dynamically added elements

Learning Outcomes:

- Learnt to integrate sqllite3 in android studio
- Learnt to do CRUD operations