



DEPARTMENT OF  
COMPUTER SCIENCE AND ENGINEERING

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## Title: SQLite Database

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MOBILE APPLICATION DEVELOPMENT  
CSE 402



GREEN UNIVERSITY OF BANGLADESH

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## 1 Objective(s)

- SQLite is database which is a open source database. Android comes in with built in SQLite database implementation. This experiment is designed to implement SQLite Database operation component in android development environment.

## 2 Problem analysis

SQLite supports all the relational database features. Database Package The main package is android.database.sqlite that contains the classes to manage the databases. The method openOrCreateDatabase is used to create a database. In this method the name of the database and mode is used as parameters and it returns an instance of SQLite database which you have to receive in your own object. This method not only create the database if it not exists but also open the db if it already exists. The method execSQL is defined in SQLiteDatabase class to create table or insert data into table. This method not only insert data , but also used to update or modify already existing data in database using bind arguments. An object of the Cursor class is used to retrieve anything from database. In this experiment, we will create a table in a database and perform operations to insert and view table items.

## 3 Implementation of Creation of database and table along with insertion operation on table

### 3.1 XML File of MainActivity

```
1 <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
2   xmlns:app="http://schemas.android.com/apk/res-auto"
3   xmlns:tools="http://schemas.android.com/tools"
4   android:layout_width="match_parent"
5   android:layout_height="match_parent"
6   android:orientation="vertical"
7   tools:context=".MainActivity">
8
9   <LinearLayout
10      android:layout_width="match_parent"
11      android:layout_height="wrap_content"
12      android:layout_marginTop="50dp"
13      android:orientation="horizontal">
14
15      <TextView
16         android:layout_width="wrap_content"
17         android:layout_height="wrap_content"
18         android:text="Name: "
19         android:textSize="15sp" />
20
21      <EditText
22         android:id="@+id/ename"
23         android:layout_width="match_parent"
24         android:layout_height="wrap_content" />
25
26   </LinearLayout>
27
28
29   <LinearLayout
30      android:layout_width="match_parent"
31      android:layout_height="wrap_content"
32      android:layout_marginTop="25dp"
33      android:orientation="horizontal">
34
```

```

35     <TextView
36         android:layout_width="wrap_content"
37         android:layout_height="wrap_content"
38         android:text="College: "
39         android:textSize="15sp" />
40
41     <EditText
42         android:id="@+id/ecollege"
43         android:layout_width="match_parent"
44         android:layout_height="wrap_content" />
45
46 </LinearLayout>
47
48
49 <LinearLayout
50     android:layout_width="match_parent"
51     android:layout_height="wrap_content"
52     android:layout_marginTop="25dp"
53     android:gravity="center"
54     android:orientation="horizontal">
55
56     <Button
57         android:id="@+id/bininsert"
58         android:layout_width="wrap_content"
59         android:layout_height="wrap_content"
60         android:layout_marginEnd="10dp"
61         android:text="Insert" />
62
63     <Button
64         android:id="@+id/bdisplay"
65         android:layout_width="wrap_content"
66         android:layout_height="wrap_content"
67         android:layout_marginEnd="10dp"
68         android:text="Display" />
69
70     <Button
71         android:id="@+id/bexit"
72         android:layout_width="wrap_content"
73         android:layout_height="wrap_content"
74         android:text="Exit" />
75
76 </LinearLayout>
77
78 </LinearLayout>

```

### 3.2 Steps for Adding SQLite to the Project

- For Creating Database

```
1 db = openOrCreateDatabase("Mydb", MODE_PRIVATE, null);
```

- For Creating Table in the Database

```
1 db.execSQL("CREATE TABLE IF NOT EXISTS student(name VARCHAR,college
    VARCHAR);");
```

- To get input from user interface and inserting that into the database

```
1     nam = ename.getText().toString();
2     coll= ecollege.getText().toString();
3     db.execSQL("INSERT INTO student VALUES
4         ('" + nam + "','" + coll + "');"");
```

### 3.3 MainActivity Java File for Executing the Overall Operations

```
1 package com.example.something;
2
3 import androidx.appcompat.app.AppCompatActivity;
4
5 import android.content.Intent;
6 import android.database.sqlite.SQLiteDatabase;
7 import android.os.Bundle;
8 import android.view.View;
9 import android.widget.Button;
10 import android.widget.EditText;
11 import android.widget.Toast;
12
13 public class MainActivity extends AppCompatActivity {
14     EditText ename, ecollege;
15     Button bininsert, bexit, bdisplay;
16
17     String nam, coll;
18     SQLiteDatabase db;
19
20     @Override
21     protected void onCreate(Bundle savedInstanceState) {
22         super.onCreate(savedInstanceState);
23         setContentView(R.layout.activity_main);
24
25         ename = findViewById(R.id.ename);
26         ecollege = findViewById(R.id.ecollege);
27         bininsert = findViewById(R.id.bininsert);
28         bdisplay = findViewById(R.id.bdisplay);
29         bexit = findViewById(R.id.bexit);
30
31         db = openOrCreateDatabase("Mydb", MODE_PRIVATE, null);
32         db.execSQL("CREATE TABLE IF NOT EXISTS student(name VARCHAR,college
33             VARCHAR)");
34
35         bininsert.setOnClickListener(new View.OnClickListener() {
36             @Override
37             public void onClick(View v) {
38                 nam = ename.getText().toString();
39                 coll = ecollege.getText().toString();
40                 db.execSQL("INSERT INTO student VALUES('" + nam + "','" + coll +
41                     "');"");
42                 Toast.makeText(getApplicationContext(), "Row Inserted", Toast.
43                     LENGTH_SHORT).show();
44             }
45         });
46         bdisplay.setOnClickListener(new View.OnClickListener() {
47             @Override
48             public void onClick(View v) {
49                 Intent intent = new Intent(getApplicationContext(),
50                     PreviewActivity.class);
```

```

47         startActivity(intent);
48         finish();
49     }
50 });
51 bexit.setOnClickListener(new View.OnClickListener() {
52     @Override
53     public void onClick(View v) {
54         System.exit(0);
55     }
56 });
57 }
58 }

```

### 3.4 Creation of PreviewActivity to View Table Records

- App -> New -> Activity -> Empty Activity
- Give activity a name, here PreviewActivity

## 4 Implementation of Data Retrieval from Database

### 4.1 XML File of Preview Activity

```

1 <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
2     xmlns:app="http://schemas.android.com/apk/res-auto"
3     xmlns:tools="http://schemas.android.com/tools"
4     android:layout_width="match_parent"
5     android:layout_height="match_parent"
6     android:orientation="vertical"
7     tools:context=".PreviewActivity">
8
9     <LinearLayout
10         android:layout_width="match_parent"
11         android:layout_height="wrap_content"
12         android:layout_marginTop="50dp"
13         android:orientation="horizontal">
14
15         <TextView
16             android:layout_width="wrap_content"
17             android:layout_height="wrap_content"
18             android:text="Name: "
19             android:textSize="15sp" />
20
21         <TextView
22             android:id="@+id/tname"
23             android:layout_width="wrap_content"
24             android:layout_height="wrap_content"
25             android:textSize="15sp" />
26     </LinearLayout>
27 <LinearLayout
28     android:layout_width="match_parent"
29     android:layout_height="wrap_content"
30     android:layout_marginTop="25dp"
31     android:orientation="horizontal">
32
33     <TextView
34         android:layout_width="wrap_content"

```

```

35         android:layout_height="wrap_content"
36         android:text="College: "
37         android:textSize="15sp" />
38
39     <TextView
40         android:id="@+id/tcollege"
41         android:layout_width="wrap_content"
42         android:layout_height="wrap_content"
43         android:textSize="15sp" />
44 </LinearLayout>
45 <LinearLayout
46     android:layout_width="match_parent"
47     android:layout_height="wrap_content"
48     android:layout_marginTop="25dp"
49     android:gravity="center"
50     android:orientation="horizontal">
51
52     <Button
53         android:id="@+id/bprev"
54         android:layout_width="wrap_content"
55         android:layout_height="wrap_content"
56         android:layout_marginEnd="100dp"
57         android:text="Prev" />
58
59     <Button
60         android:id="@+id/bnext"
61         android:layout_width="wrap_content"
62         android:layout_height="wrap_content"
63         android:text="Next" />
64 </LinearLayout>
65 <Button
66     android:id="@+id/bback"
67     android:layout_width="wrap_content"
68     android:layout_height="wrap_content"
69     android:layout_gravity="center"
70     android:layout_marginTop="50dp"
71     android:text="Home" />
72
73 </LinearLayout>

```

## 4.2 Java File of PreviewActivity Executing the Retrieval Operation

```

1 package com.example.something;
2
3 import androidx.appcompat.app.AppCompatActivity;
4
5 import android.content.Intent;
6 import android.database.Cursor;
7 import android.database.sqlite.SQLiteDatabase;
8 import android.os.Bundle;
9 import android.view.View;
10 import android.widget.Button;
11 import android.widget.TextView;
12 import android.widget.Toast;
13
14 public class PreviewActivity extends AppCompatActivity {
15     TextView tname, tcollege;

```

```

16 Button bprev, bnext, bback;
17
18 SQLiteDatabase db;
19 @Override
20 protected void onCreate(Bundle savedInstanceState) {
21     super.onCreate(savedInstanceState);
22     setContentView(R.layout.activity_preview);
23     tname = findViewById(R.id.tname);
24     tcollege = findViewById(R.id.tcollege);
25     bprev = findViewById(R.id.bprev);
26     bnext = findViewById(R.id.bnext);
27     bback = findViewById(R.id.bback);
28
29     db = openOrCreateDatabase("Mydb", MODE_PRIVATE, null);
30
31     final Cursor c = db.rawQuery("select * from student", null);
32     c.moveToFirst();
33     tname.setText(c.getString(c.getColumnIndex("name")));
34     tcollege.setText(c.getString(c.getColumnIndex("college")));
35
36     bback.setOnClickListener(new View.OnClickListener() {
37         @Override
38         public void onClick(View v) {
39             Intent intent = new Intent(getApplicationContext(), MainActivity
40                 .class);
41             startActivity(intent);
42             finish();
43         }
44     });
45
46     bnext.setOnClickListener(new View.OnClickListener() {
47         @Override
48         public void onClick(View v) {
49             try {
50                 c.moveToNext();
51                 tname.setText(c.getString(c.getColumnIndex("name")));
52                 tcollege.setText(c.getString(c.getColumnIndex("college")));
53             } catch (Exception e) {
54                 Toast.makeText(getApplicationContext(), "Last Record", Toast
55                     .LENGTH_LONG).show();
56                 e.printStackTrace();
57             }
58         }
59     });
60
61     bprev.setOnClickListener(new View.OnClickListener() {
62         @Override
63         public void onClick(View v) {
64             try {
65                 c.moveToPrevious();
66                 tname.setText(c.getString(c.getColumnIndex("name")));
67                 tcollege.setText(c.getString(c.getColumnIndex("college")));
68             } catch (Exception e) {
69                 Toast.makeText(getApplicationContext(), "First Record",
70                     Toast.LENGTH_LONG).show();
71                 e.printStackTrace();
72             }
73         }
74     });
75
76 }

```

---

```
71         });  
72     }  
73 }
```

## 5 Input/Output

Run the code and observe the output in the virtual device.

## 6 Discussion & Conclusion

From this experiments we learn about how intent, pending intent, broadcast intent work. This experiment is designed in a way to teach the students about implementing android Broadcast Component.

## 7 Lab Task (Please implement yourself and show the output to the instructor)

1. Show all the items of the table in a list.
2. Search for any particular item in the table.

### 7.1 Problem analysis

Implement the lab tasks with the help of retrieval done in PreviewActivity. Use Cursor to show all the elements of the table in a list. After retrieving check if the item matches with the item user is trying to find. If it does then show a Toast otherwise throw exception that item not found.

## 8 Lab Exercise (Submit as a report)

- Implement Update and Delete operations on the database.

## 9 Policy

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