

ASSIGNMENT 4

Android Application Development using Database

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Learning Objective

In main activity have the following buttons: Create, Insert, Update, Delete, Retrieve

Specifications

1. On clicking Create Button, create a new database to store the following contents.
(Use SQLite Database)
 - (a) Name
 - (b) Gender
 - (c) Employee Code
 - (d) Department
 - (e) Salary
2. On Clicking Insert, move to a new view which contains the following details:
(Insert new Employee to the database)
 - (a) Name (EditText - Validation checking - Alphabet)
 - (b) Gender (RadioButton)
 - (c) Employee Code(EditText - Validation checking - Alphanumeric)
 - (d) Department (Spinner)
 - (e) Salary (EditText - Validation checking - Numeric)
 - (f) Submit (Button – On press, Insert the data into database)

3. On clicking Update, move to a new view which contains above details and Update by Employee Code.
4. On clicking Delete, Delete the whole row in the table by Employee Code.
5. On clicking Retrieve, Retrieve an employee by Employee Code. Also retrieve the details of all the employees in a particular department.

Home (Main Activity)

XML (activity_main.xml)

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://
  //schemas.android.com/apk/res/android"
3   xmlns:app="http://schemas.android.com/apk/res-auto"
4   xmlns:tools="http://schemas.android.com/tools"
5   android:layout_width="match_parent"
6   android:layout_height="match_parent"
7   tools:context=".MainActivity">
8
9   <TextView
10     android:id="@+id/headerText"
11     android:layout_width="wrap_content"
12     android:layout_height="wrap_content"
13     android:layout_marginTop="32dp"
14     android:fontFamily="@font/roboto_bold"
15     android:text="Employee Management Application"
16     android:textAlignment="center"
17     android:textColor="@color/design_default_color_error"
18     android:textSize="20sp"
19     app:layout_constraintEnd_toEndOf="parent"
20     app:layout_constraintStart_toStartOf="parent"
21     app:layout_constraintTop_toTopOf="parent" />
22
23   <Button
24     android:id="@+id/createBtn"
25     android:layout_width="wrap_content"
26     android:layout_height="wrap_content"
27     android:layout_marginTop="32dp"
28     android:fontFamily="@font/roboto_medium"
29     android:text="Create Database"
30     app:layout_constraintEnd_toEndOf="parent"
31     app:layout_constraintStart_toStartOf="parent"
32     app:layout_constraintTop_toBottomOf="@+id/headerText" />
33
34   <Button
35     android:id="@+id/insertBtn"
36     android:layout_width="wrap_content"
37     android:layout_height="wrap_content"
38     android:layout_marginTop="24dp"
39     android:fontFamily="@font/roboto_medium"
40     android:text="Insert a new Record"
41     app:layout_constraintEnd_toEndOf="parent"
42     app:layout_constraintStart_toStartOf="parent"
43     app:layout_constraintTop_toBottomOf="@+id/createBtn" />
44
45   <Button
46     android:id="@+id/updateBtn"
47     android:layout_width="wrap_content"
```

```

48         android:layout_height="wrap_content"
49         android:layout_marginTop="24dp"
50         android:fontFamily="@font/roboto_medium"
51         android:text="Update a Record"
52         app:layout_constraintEnd_toEndOf="parent"
53         app:layout_constraintStart_toStartOf="parent"
54         app:layout_constraintTop_toBottomOf="@+id/insertBtn" />
55
56     <Button
57         android:id="@+id/deleteBtn"
58         android:layout_width="wrap_content"
59         android:layout_height="wrap_content"
60         android:layout_marginTop="24dp"
61         android:fontFamily="@font/roboto_medium"
62         android:text="Delete a Record"
63         app:layout_constraintEnd_toEndOf="parent"
64         app:layout_constraintStart_toStartOf="parent"
65         app:layout_constraintTop_toBottomOf="@+id/updateBtn" />
66
67     <Button
68         android:id="@+id/retrieveECodeBtn"
69         android:layout_width="wrap_content"
70         android:layout_height="wrap_content"
71         android:layout_marginTop="24dp"
72         android:fontFamily="@font/roboto_medium"
73         android:text="Retrieve by Employee Code"
74         app:layout_constraintEnd_toEndOf="parent"
75         app:layout_constraintStart_toStartOf="parent"
76         app:layout_constraintTop_toBottomOf="@+id/deleteBtn" />
77
78     <Button
79         android:id="@+id/retrieveDeptBtn"
80         android:layout_width="wrap_content"
81         android:layout_height="wrap_content"
82         android:layout_marginTop="24dp"
83         android:fontFamily="@font/roboto_medium"
84         android:text="Retrieve by Department"
85         app:layout_constraintEnd_toEndOf="parent"
86         app:layout_constraintStart_toStartOf="parent"
87         app:layout_constraintTop_toBottomOf="@+id/retrieveECodeBtn" />
88 </androidx.constraintlayout.widget.ConstraintLayout>

```

Java (MainActivity.java)

```
1 package com.madlab.databaseoperations;
2
3 import androidx.appcompat.app.AppCompatActivity;
4
5 import android.content.Intent;
6 import android.database.sqlite.SQLiteDatabase;
7 import android.database.sqlite.SQLiteOpenHelper;
8 import android.os.Bundle;
9 import android.view.View;
10 import android.widget.Button;
11 import android.widget.Toast;
12
13 public class MainActivity extends AppCompatActivity {
14
15     @Override
16     protected void onCreate(Bundle savedInstanceState) {
17         super.onCreate(savedInstanceState);
18         setContentView(R.layout.activity_main);
19
20         final Button createBtn = findViewById(R.id.createBtn);
21         final Button insertBtn = findViewById(R.id.insertBtn);
22         final Button updateBtn = findViewById(R.id.updateBtn);
23         final Button deleteBtn = findViewById(R.id.deleteBtn);
24         final Button retrieveECodeBtn = findViewById(R.id.
retrieveECodeBtn);
25         final Button retrieveDeptBtn = findViewById(R.id.retrieveDeptBtn
);
26
27         final SQLiteOpenHelper databaseHelper = new
EmployeeDatabaseHelper(this);
28
29         createBtn.setOnClickListener(new View.OnClickListener() {
30             @Override
31             public void onClick(View view) {
32                 try {
33                     SQLiteDatabase db = databaseHelper.
getReadableDatabase();
34                     Toast toast = Toast.makeText(MainActivity.this, "
Database Created Successfully!", Toast.LENGTH_SHORT);
35                     toast.show();
36                 } catch (Exception e) {
37                     Toast toast = Toast.makeText(MainActivity.this, "
Database Unavailable!", Toast.LENGTH_SHORT);
38                     toast.show();
39                 }
40             }
41         });
42
43         insertBtn.setOnClickListener(new View.OnClickListener() {
44             @Override
45             public void onClick(View view) {
```

```

46         Intent insertIntent = new Intent(getApplicationContext()
47         , InsertActivity.class);
48         startActivity(insertIntent);
49     }
50 });
51
52     updateBtn.setOnClickListener(new View.OnClickListener() {
53         @Override
54         public void onClick(View view) {
55             Intent updateIntent = new Intent(getApplicationContext()
56             , UpdateActivity.class);
57             startActivity(updateIntent);
58         }
59     });
60
61     deleteBtn.setOnClickListener(new View.OnClickListener() {
62         @Override
63         public void onClick(View view) {
64             Intent deleteIntent = new Intent(getApplicationContext()
65             , DeleteActivity.class);
66             startActivity(deleteIntent);
67         }
68     });
69
70     retrieveECodeBtn.setOnClickListener(new View.OnClickListener() {
71         @Override
72         public void onClick(View view) {
73             Intent retrieveECodeIntent = new Intent(
74             getApplicationContext(), RetrieveECodeActivity.class);
75             startActivity(retrieveECodeIntent);
76         }
77     });
78
79     retrieveDeptBtn.setOnClickListener(new View.OnClickListener() {
80         @Override
81         public void onClick(View view) {
82             Intent retrieveDeptIntent = new Intent(
83             getApplicationContext(), RetrieveDepartmentActivity.class);
84             startActivity(retrieveDeptIntent);
85         }
86     });
87 }
88 }

```

Insert Database

XML (activity_insert.xml)

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://
  //schemas.android.com/apk/res/android"
3   xmlns:app="http://schemas.android.com/apk/res-auto"
4   xmlns:tools="http://schemas.android.com/tools"
5   android:layout_width="match_parent"
6   android:layout_height="match_parent"
7   tools:context=".InsertActivity">
8
9   <TextView
10     android:id="@+id/Header"
11     android:layout_width="wrap_content"
12     android:layout_height="wrap_content"
13     android:layout_marginTop="32dp"
14     android:fontFamily="@font/roboto_bold"
15     android:text="Insert a New Record"
16     android:textColor="@color/design_default_color_error"
17     android:textSize="20sp"
18     app:layout_constraintEnd_toEndOf="parent"
19     app:layout_constraintStart_toStartOf="parent"
20     app:layout_constraintTop_toTopOf="parent" />
21
22   <LinearLayout
23     android:id="@+id/EcodeFieldLayout"
24     android:layout_width="0dp"
25     android:layout_height="wrap_content"
26     android:layout_marginStart="8dp"
27     android:layout_marginTop="32dp"
28     android:layout_marginEnd="8dp"
29     android:orientation="horizontal"
30     app:layout_constraintEnd_toEndOf="parent"
31     app:layout_constraintStart_toStartOf="parent"
32     app:layout_constraintTop_toBottomOf="@+id/Header">
33
34     <TextView
35       android:id="@+id/ECodeLabel"
36       android:layout_width="0dp"
37       android:layout_height="wrap_content"
38       android:layout_weight="1"
39       android:fontFamily="@font/roboto_medium"
40       android:text="Employee Code"
41       android:textColor="@color/purple_500"
42       android:textSize="16sp" />
43
44     <EditText
45       android:id="@+id/eCodeEditTxt"
46       android:layout_width="0dp"
47       android:layout_height="wrap_content"
```

```

48         android:layout_weight="1"
49         android:ems="10"
50         android:fontFamily="@font/roboto_medium"
51         android:hint="E0000"
52         android:inputType="textPersonName"
53         android:textColor="@color/purple_700"
54         android:textSize="16sp" />
55     </LinearLayout>
56
57     <LinearLayout
58         android:id="@+id/NameFieldLayout"
59         android:layout_width="0dp"
60         android:layout_height="wrap_content"
61         android:layout_marginStart="8dp"
62         android:layout_marginTop="32dp"
63         android:layout_marginEnd="8dp"
64         android:orientation="horizontal"
65         app:layout_constraintEnd_toEndOf="parent"
66         app:layout_constraintStart_toStartOf="parent"
67         app:layout_constraintTop_toBottomOf="@+id/EcodeFieldLayout">
68
69         <TextView
70             android:id="@+id/nameLabel"
71             android:layout_width="0dp"
72             android:layout_height="wrap_content"
73             android:layout_weight="1"
74             android:fontFamily="@font/roboto_medium"
75             android:text="Name"
76             android:textColor="@color/purple_500"
77             android:textSize="16sp" />
78
79         <EditText
80             android:id="@+id/nameEditTxt"
81             android:layout_width="0dp"
82             android:layout_height="wrap_content"
83             android:layout_weight="2"
84             android:ems="10"
85             android:fontFamily="@font/roboto_medium"
86             android:hint="John Doe"
87             android:inputType="textPersonName"
88             android:textColor="@color/purple_700"
89             android:textSize="16sp" />
90     </LinearLayout>
91
92     <LinearLayout
93         android:id="@+id/genderFieldLayout"
94         android:layout_width="0dp"
95         android:layout_height="wrap_content"
96         android:layout_marginStart="8dp"
97         android:layout_marginTop="32dp"
98         android:layout_marginEnd="8dp"
99         app:layout_constraintEnd_toEndOf="parent"
100        app:layout_constraintStart_toStartOf="parent"

```



```

101     app:layout_constraintTop_toBottomOf="@+id/NameFieldLayout">
102
103     <TextView
104         android:id="@+id/genderLabel"
105         android:layout_width="0dp"
106         android:layout_height="wrap_content"
107         android:layout_weight="1"
108         android:fontFamily="@font/roboto_medium"
109         android:text="Gender"
110         android:textColor="@color/purple_500"
111         android:textSize="16sp" />
112
113     <RadioGroup
114         android:id="@+id/genderRadioGroup"
115         android:layout_width="0dp"
116         android:layout_height="match_parent"
117         android:layout_weight="2"
118         android:orientation="horizontal">
119
120         <RadioButton
121             android:id="@+id/maleRadioBtn"
122             android:layout_width="wrap_content"
123             android:layout_height="wrap_content"
124             android:layout_weight="1"
125             android:fontFamily="@font/roboto_medium"
126             android:text="Male" />
127
128         <RadioButton
129             android:id="@+id/femaleRadioBtn"
130             android:layout_width="wrap_content"
131             android:layout_height="wrap_content"
132             android:layout_weight="1"
133             android:fontFamily="@font/roboto_medium"
134             android:text="Female" />
135
136         <RadioButton
137             android:id="@+id/otherRadioBtn"
138             android:layout_width="wrap_content"
139             android:layout_height="wrap_content"
140             android:layout_weight="1"
141             android:fontFamily="@font/roboto_medium"
142             android:text="Other" />
143     </RadioGroup>
144 </LinearLayout>
145
146 <LinearLayout
147     android:id="@+id/departmentFieldLayout"
148     android:layout_width="0dp"
149     android:layout_height="wrap_content"
150     android:layout_marginStart="8dp"
151     android:layout_marginTop="32dp"
152     android:layout_marginEnd="8dp"
153     android:orientation="horizontal"

```

```

154     app:layout_constraintEnd_toEndOf="parent"
155     app:layout_constraintStart_toStartOf="parent"
156     app:layout_constraintTop_toBottomOf="@+id/genderFieldLayout">
157
158     <TextView
159         android:id="@+id/departmentLabel"
160         android:layout_width="0dp"
161         android:layout_height="wrap_content"
162         android:layout_weight="1"
163         android:fontFamily="@font/roboto_medium"
164         android:text="Department"
165         android:textColor="@color/purple_500"
166         android:textSize="16sp" />
167
168     <Spinner
169         android:id="@+id/departmentSpinner"
170         android:layout_width="0dp"
171         android:layout_height="wrap_content"
172         android:layout_weight="2"
173         android:entries="@array/departments" />
174 </LinearLayout>
175
176 <LinearLayout
177     android:id="@+id/salaryFieldLayout"
178     android:layout_width="0dp"
179     android:layout_height="wrap_content"
180     android:layout_marginStart="8dp"
181     android:layout_marginTop="32dp"
182     android:layout_marginEnd="8dp"
183     android:orientation="horizontal"
184     app:layout_constraintEnd_toEndOf="parent"
185     app:layout_constraintStart_toStartOf="parent"
186     app:layout_constraintTop_toBottomOf="@+id/departmentFieldLayout"
187 >
188
189     <TextView
190         android:id="@+id/salaryLabel"
191         android:layout_width="0dp"
192         android:layout_height="wrap_content"
193         android:layout_weight="1"
194         android:fontFamily="@font/roboto_medium"
195         android:text="Salary"
196         android:textColor="@color/purple_500"
197         android:textSize="16sp" />
198
199     <EditText
200         android:id="@+id/salaryEditTxt"
201         android:layout_width="0dp"
202         android:layout_height="wrap_content"
203         android:layout_weight="2"
204         android:ems="10"
205         android:fontFamily="@font/roboto_medium"
206         android:hint="1200000"

```

```
206         android:inputType="numberDecimal" />
207     </LinearLayout>
208
209     <Button
210         android:id="@+id/insertRecordBtn"
211         android:layout_width="wrap_content"
212         android:layout_height="wrap_content"
213         android:layout_marginTop="32dp"
214         android:fontFamily="@font/roboto_bold"
215         android:text="Insert Record"
216         app:layout_constraintEnd_toEndOf="parent"
217         app:layout_constraintStart_toStartOf="parent"
218         app:layout_constraintTop_toBottomOf="@+id/salaryFieldLayout" />
219
220 </androidx.constraintlayout.widget.ConstraintLayout>
```

Java (InsertActivity.java)

```
1 package com.madlab.databaseoperations;
2
3 import androidx.appcompat.app.AppCompatActivity;
4
5 import android.os.Bundle;
6 import android.text.TextUtils;
7 import android.view.View;
8 import android.widget.Button;
9 import android.widget.EditText;
10 import android.widget.RadioButton;
11 import android.widget.RadioGroup;
12 import android.widget.Spinner;
13 import android.widget.Toast;
14
15 public class InsertActivity extends AppCompatActivity {
16
17     @Override
18     protected void onCreate(Bundle savedInstanceState) {
19         super.onCreate(savedInstanceState);
20         setContentView(R.layout.activity_insert);
21
22         final EditText eCodeText = findViewById(R.id.eCodeEditTxt);
23         final EditText nameText = findViewById(R.id.nameEditTxt);
24         final RadioGroup genderRadioGroup = findViewById(R.id.
genderRadioGroup);
25         final Spinner departmentSpinner = findViewById(R.id.
departmentSpinner);
26         final EditText salaryText = findViewById(R.id.salaryEditTxt);
27         final Button insertButton = findViewById(R.id.insertRecordBtn);
28
29         final EmployeeDatabaseHelper employeeDatabaseHelper = new
EmployeeDatabaseHelper(this);
30
31         insertButton.setOnClickListener(new View.OnClickListener() {
32             @Override
33             public void onClick(View view) {
34                 String eCode = eCodeText.getText().toString();
35                 String name = nameText.getText().toString();
36                 int selectedRadioButtonID = genderRadioGroup.
getCheckedRadioButtonId();
37                 String department = departmentSpinner.getSelectedItem().
toString();
38                 String salaryStr = salaryText.getText().toString();
39
40                 if(TextUtils.isEmpty(eCode)) {
41                     Toast toast = Toast.makeText(InsertActivity.this, "
Employee Code cannot be empty!", Toast.LENGTH_SHORT);
42                     toast.show();
43                 } else if(TextUtils.isEmpty(name)){
44                     Toast toast = Toast.makeText(InsertActivity.this, "
Name cannot be empty!", Toast.LENGTH_SHORT);
```

```

45         toast.show();
46     } else if(TextUtils.isEmpty(salaryStr)) {
47         Toast toast = Toast.makeText(InsertActivity.this, "
Salary cannot be empty!", Toast.LENGTH_SHORT);
48         toast.show();
49     } else if(eCode.charAt(0) != 'E') {
50         eCodeText.setText("");
51         Toast toast = Toast.makeText(InsertActivity.this, "
Employee Code must begin with an 'E'!", Toast.LENGTH_SHORT);
52         toast.show();
53     } else if(name.matches(".*\\d.*")) {
54         nameText.setText("");
55         Toast toast = Toast.makeText(InsertActivity.this, "
Name cannot contain digits!", Toast.LENGTH_SHORT);
56         toast.show();
57     } else if(selectedRadioButtonID < 0) {
58         Toast toast = Toast.makeText(InsertActivity.this, "
Please select a gender!", Toast.LENGTH_SHORT);
59         toast.show();
60     } else {
61         RadioButton selectedRadioButton = genderRadioGroup.
findViewById(selectedRadioButtonID);
62         String gender = selectedRadioButton.getText().
toString();
63         Double salary = Double.parseDouble(salaryStr);
64
65         try {
66             employeeDatabaseHelper.insertRecord(eCode, name,
gender, department, salary);
67             Toast toast = Toast.makeText(InsertActivity.this
, "Record Successfully Inserted!", Toast.LENGTH_SHORT);
68             toast.show();
69         } catch (Exception e) {
70             Toast toast = Toast.makeText(InsertActivity.this
, e.getMessage(), Toast.LENGTH_SHORT);
71             toast.show();
72         }
73     }
74 }
75 });
76 }
77 }

```

Update Activity

XML (activity_update.xml)

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://
  //schemas.android.com/apk/res/android"
3   xmlns:app="http://schemas.android.com/apk/res-auto"
4   xmlns:tools="http://schemas.android.com/tools"
5   android:layout_width="match_parent"
6   android:layout_height="match_parent"
7   tools:context=".UpdateActivity">
8
9   <TextView
10     android:id="@+id/Header"
11     android:layout_width="wrap_content"
12     android:layout_height="wrap_content"
13     android:layout_marginTop="32dp"
14     android:fontFamily="@font/roboto_bold"
15     android:text="Update an existing record"
16     android:textColor="@color/design_default_color_error"
17     android:textSize="20sp"
18     app:layout_constraintEnd_toEndOf="parent"
19     app:layout_constraintStart_toStartOf="parent"
20     app:layout_constraintTop_toTopOf="parent" />
21
22   <LinearLayout
23     android:id="@+id/EcodeFieldLayout"
24     android:layout_width="0dp"
25     android:layout_height="wrap_content"
26     android:layout_marginStart="8dp"
27     android:layout_marginTop="32dp"
28     android:layout_marginEnd="8dp"
29     android:orientation="horizontal"
30     app:layout_constraintEnd_toEndOf="parent"
31     app:layout_constraintStart_toStartOf="parent"
32     app:layout_constraintTop_toBottomOf="@+id/Header">
33
34     <TextView
35       android:id="@+id/ECodeLabel"
36       android:layout_width="0dp"
37       android:layout_height="wrap_content"
38       android:layout_weight="1"
39       android:fontFamily="@font/roboto_medium"
40       android:text="Employee Code"
41       android:textColor="@color/purple_500"
42       android:textSize="16sp" />
43
44     <EditText
45       android:id="@+id/eCodeEditTxt"
46       android:layout_width="0dp"
47       android:layout_height="wrap_content"
```

```

48         android:layout_weight="1"
49         android:ems="10"
50         android:fontFamily="@font/roboto_medium"
51         android:hint="E0000"
52         android:inputType="textPersonName"
53         android:textColor="@color/purple_700"
54         android:textSize="16sp" />
55     </LinearLayout>
56
57     <LinearLayout
58         android:id="@+id/NameFieldLayout"
59         android:layout_width="0dp"
60         android:layout_height="wrap_content"
61         android:layout_marginStart="8dp"
62         android:layout_marginTop="32dp"
63         android:layout_marginEnd="8dp"
64         android:orientation="horizontal"
65         app:layout_constraintEnd_toEndOf="parent"
66         app:layout_constraintStart_toStartOf="parent"
67         app:layout_constraintTop_toBottomOf="@+id/EcodeFieldLayout">
68
69         <TextView
70             android:id="@+id/nameLabel"
71             android:layout_width="0dp"
72             android:layout_height="wrap_content"
73             android:layout_weight="1"
74             android:fontFamily="@font/roboto_medium"
75             android:text="Name"
76             android:textColor="@color/purple_500"
77             android:textSize="16sp" />
78
79         <EditText
80             android:id="@+id/nameEditTxt"
81             android:layout_width="0dp"
82             android:layout_height="wrap_content"
83             android:layout_weight="2"
84             android:ems="10"
85             android:fontFamily="@font/roboto_medium"
86             android:hint="John Doe"
87             android:inputType="textPersonName"
88             android:textColor="@color/purple_700"
89             android:textSize="16sp" />
90     </LinearLayout>
91
92     <LinearLayout
93         android:id="@+id/genderFieldLayout"
94         android:layout_width="0dp"
95         android:layout_height="wrap_content"
96         android:layout_marginStart="8dp"
97         android:layout_marginTop="32dp"
98         android:layout_marginEnd="8dp"
99         app:layout_constraintEnd_toEndOf="parent"
100        app:layout_constraintStart_toStartOf="parent"

```

```

101     app:layout_constraintTop_toBottomOf="@+id/NameFieldLayout">
102
103     <TextView
104         android:id="@+id/genderLabel"
105         android:layout_width="0dp"
106         android:layout_height="wrap_content"
107         android:layout_weight="1"
108         android:fontFamily="@font/roboto_medium"
109         android:text="Gender"
110         android:textColor="@color/purple_500"
111         android:textSize="16sp" />
112
113     <RadioGroup
114         android:id="@+id/genderRadioGroup"
115         android:layout_width="0dp"
116         android:layout_height="match_parent"
117         android:layout_weight="2"
118         android:orientation="horizontal">
119
120         <RadioButton
121             android:id="@+id/maleRadioBtn"
122             android:layout_width="wrap_content"
123             android:layout_height="wrap_content"
124             android:layout_weight="1"
125             android:fontFamily="@font/roboto_medium"
126             android:text="Male" />
127
128         <RadioButton
129             android:id="@+id/femaleRadioBtn"
130             android:layout_width="wrap_content"
131             android:layout_height="wrap_content"
132             android:layout_weight="1"
133             android:fontFamily="@font/roboto_medium"
134             android:text="Female" />
135
136         <RadioButton
137             android:id="@+id/otherRadioBtn"
138             android:layout_width="wrap_content"
139             android:layout_height="wrap_content"
140             android:layout_weight="1"
141             android:fontFamily="@font/roboto_medium"
142             android:text="Other" />
143     </RadioGroup>
144 </LinearLayout>
145
146 <LinearLayout
147     android:id="@+id/departmentFieldLayout"
148     android:layout_width="0dp"
149     android:layout_height="wrap_content"
150     android:layout_marginStart="8dp"
151     android:layout_marginTop="32dp"
152     android:layout_marginEnd="8dp"
153     android:orientation="horizontal">

```



```

154     app:layout_constraintEnd_toEndOf="parent"
155     app:layout_constraintStart_toStartOf="parent"
156     app:layout_constraintTop_toBottomOf="@+id/genderFieldLayout">
157
158     <TextView
159         android:id="@+id/departmentLabel"
160         android:layout_width="0dp"
161         android:layout_height="wrap_content"
162         android:layout_weight="1"
163         android:fontFamily="@font/roboto_medium"
164         android:text="Department"
165         android:textColor="@color/purple_500"
166         android:textSize="16sp" />
167
168     <Spinner
169         android:id="@+id/departmentSpinner"
170         android:layout_width="0dp"
171         android:layout_height="wrap_content"
172         android:layout_weight="2"
173         android:entries="@array/departments" />
174 </LinearLayout>
175
176 <LinearLayout
177     android:id="@+id/salaryFieldLayout"
178     android:layout_width="0dp"
179     android:layout_height="wrap_content"
180     android:layout_marginStart="8dp"
181     android:layout_marginTop="32dp"
182     android:layout_marginEnd="8dp"
183     android:orientation="horizontal"
184     app:layout_constraintEnd_toEndOf="parent"
185     app:layout_constraintStart_toStartOf="parent"
186     app:layout_constraintTop_toBottomOf="@+id/departmentFieldLayout"
187 >
188
189     <TextView
190         android:id="@+id/salaryLabel"
191         android:layout_width="0dp"
192         android:layout_height="wrap_content"
193         android:layout_weight="1"
194         android:fontFamily="@font/roboto_medium"
195         android:text="Salary"
196         android:textColor="@color/purple_500"
197         android:textSize="16sp" />
198
199     <EditText
200         android:id="@+id/salaryEditTxt"
201         android:layout_width="0dp"
202         android:layout_height="wrap_content"
203         android:layout_weight="2"
204         android:ems="10"
205         android:fontFamily="@font/roboto_medium"
206         android:hint="1200000"

```

```

206         android:inputType="numberDecimal" />
207     </LinearLayout>
208
209     <Button
210         android:id="@+id/retrieveCurrentBtn"
211         android:layout_width="wrap_content"
212         android:layout_height="wrap_content"
213         android:layout_marginTop="32dp"
214         android:fontFamily="@font/roboto_bold"
215         android:text="Retrieve Current Details"
216         app:layout_constraintEnd_toEndOf="parent"
217         app:layout_constraintStart_toStartOf="parent"
218         app:layout_constraintTop_toBottomOf="@+id/salaryFieldLayout" />
219
220     <Button
221         android:id="@+id/updateRecordBtn"
222         android:layout_width="wrap_content"
223         android:layout_height="wrap_content"
224         android:layout_marginTop="8dp"
225         android:fontFamily="@font/roboto_bold"
226         android:text="Update Record"
227         app:layout_constraintEnd_toEndOf="parent"
228         app:layout_constraintStart_toStartOf="parent"
229         app:layout_constraintTop_toBottomOf="@+id/retrieveCurrentBtn" />
230
231 </androidx.constraintlayout.widget.ConstraintLayout>

```

Java (UpdateActivity.java)

```
1 package com.madlab.databaseoperations;
2
3 import androidx.appcompat.app.AppCompatActivity;
4
5 import android.os.Bundle;
6 import android.provider.MediaStore;
7 import android.text.TextUtils;
8 import android.view.View;
9 import android.widget.Button;
10 import android.widget.EditText;
11 import android.widget.RadioButton;
12 import android.widget.RadioGroup;
13 import android.widget.Spinner;
14 import android.widget.Toast;
15
16 public class UpdateActivity extends AppCompatActivity {
17
18     @Override
19     protected void onCreate(Bundle savedInstanceState) {
20         super.onCreate(savedInstanceState);
21         setContentView(R.layout.activity_update);
22
23         final EditText eCodeText = findViewById(R.id.eCodeEditTxt);
24         final EditText nameText = findViewById(R.id.nameEditTxt);
25         final RadioGroup genderRadioGroup = findViewById(R.id.
genderRadioGroup);
26         final RadioButton maleRadioButton = findViewById(R.id.
maleRadioBtn);
27         final RadioButton femaleRadioButton = findViewById(R.id.
femaleRadioBtn);
28         final RadioButton otherRadioButton = findViewById(R.id.
otherRadioBtn);
29         final Spinner departmentSpinner = findViewById(R.id.
departmentSpinner);
30         final EditText salaryText = findViewById(R.id.salaryEditTxt);
31         final Button retrieveCurrentDetailsButton = findViewById(R.id.
retrieveCurrentBtn);
32         final Button updateButton = findViewById(R.id.updateRecordBtn);
33
34         final EmployeeDatabaseHelper employeeDatabaseHelper = new
EmployeeDatabaseHelper(this);
35
36         retrieveCurrentDetailsButton.setOnClickListener(new View.
OnClickListener() {
37             @Override
38             public void onClick(View view) {
39                 String eCode = eCodeText.getText().toString();
40
41                 if(TextUtils.isEmpty(eCode)) {
42                     Toast toast = Toast.makeText(UpdateActivity.this, "
Enter an Employee Code to retrieve!", Toast.LENGTH_SHORT);
```

```

43         toast.show();
44         return;
45     }
46
47     String[] results = employeeDatabaseHelper.retrieveRecord
(eCode);
48
49     if(results == null) {
50         Toast toast = Toast.makeText(UpdateActivity.this, "
No employee with that Code!", Toast.LENGTH_SHORT);
51         toast.show();
52     } else {
53         nameText.setText(results[0]);
54
55         // Check the radio button from the database
56         switch (results[1]) {
57             case "Male": maleRadioButton.toggle(); break;
58             case "Female": femaleRadioButton.toggle(); break
;
59             case "Other": otherRadioButton.toggle(); break;
60         }
61
62         // Get the selection index and set the spinner to
that index
63         int selectionIdx = getIndex(departmentSpinner,
results[2]);
64         departmentSpinner.setSelection(selectionIdx);
65
66         salaryText.setText(results[3]);
67     }
68 }
69 });
70
71 updateButton.setOnClickListener(new View.OnClickListener() {
72     @Override
73     public void onClick(View view) {
74         String eCode = eCodeText.getText().toString();
75         String name = nameText.getText().toString();
76         int selectedRadioButtonID = genderRadioGroup.
getCheckedRadioButtonId();
77         String department = departmentSpinner.getSelectedItem().
toString();
78         String salaryStr = salaryText.getText().toString();
79
80         if(TextUtils.isEmpty(eCode)) {
81             Toast toast = Toast.makeText(UpdateActivity.this, "
Employee Code cannot be empty!", Toast.LENGTH_SHORT);
82             toast.show();
83         } else if(TextUtils.isEmpty(name)){
84             Toast toast = Toast.makeText(UpdateActivity.this, "
Name cannot be empty!", Toast.LENGTH_SHORT);
85             toast.show();
86         } else if(TextUtils.isEmpty(salaryStr)) {

```

```

87         Toast toast = Toast.makeText(UpdateActivity.this, "
Salary cannot be empty!", Toast.LENGTH_SHORT);
88         toast.show();
89         } else if(eCode.charAt(0) != 'E') {
90             eCodeText.setText("");
91             Toast toast = Toast.makeText(UpdateActivity.this, "
Employee Code must begin with an 'E'!", Toast.LENGTH_SHORT);
92             toast.show();
93             } else if(name.matches(".*\\d.*")) {
94                 nameText.setText("");
95                 Toast toast = Toast.makeText(UpdateActivity.this, "
Name cannot contain digits!", Toast.LENGTH_SHORT);
96                 toast.show();
97             } else if(selectedRadioButtonID < 0) {
98                 Toast toast = Toast.makeText(UpdateActivity.this, "
Please select a gender!", Toast.LENGTH_SHORT);
99                 toast.show();
100             } else {
101                 RadioButton selectedRadioButton = genderRadioGroup.
findViewById(selectedRadioButtonID);
102                 String gender = selectedRadioButton.getText().
toString();
103                 Double salary = Double.parseDouble(salaryStr);
104
105                 try {
106                     employeeDatabaseHelper.updateRecord(eCode, name,
gender, department, salary);
107                     Toast toast = Toast.makeText(UpdateActivity.this
, "Record Successfully Inserted!", Toast.LENGTH_SHORT);
108                     toast.show();
109                     } catch(Exception e) {
110                         Toast toast = Toast.makeText(UpdateActivity.this
, e.getMessage(), Toast.LENGTH_SHORT);
111                         toast.show();
112                     }
113             }
114         });
115     });
116 }
117
118 private int getIndex(Spinner spinner, String myString) {
119     for (int i = 0; i < spinner.getCount(); i++) {
120         if (spinner.getItemAtPosition(i).toString().equalsIgnoreCase
(myString)){
121             return i;
122         }
123     }
124
125     return 0;
126 }
127 }

```

Delete Activity

XML (activity_delete.xml)

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://
  //schemas.android.com/apk/res/android"
3   xmlns:app="http://schemas.android.com/apk/res-auto"
4   xmlns:tools="http://schemas.android.com/tools"
5   android:layout_width="match_parent"
6   android:layout_height="match_parent"
7   tools:context=".DeleteActivity">
8
9   <TextView
10      android:id="@+id/Header"
11      android:layout_width="wrap_content"
12      android:layout_height="wrap_content"
13      android:layout_marginTop="32dp"
14      android:fontFamily="@font/roboto_bold"
15      android:text="Delete using Employee Code"
16      android:textColor="@color/design_default_color_error"
17      android:textSize="20sp"
18      app:layout_constraintEnd_toEndOf="parent"
19      app:layout_constraintStart_toStartOf="parent"
20      app:layout_constraintTop_toTopOf="parent" />
21
22   <LinearLayout
23      android:id="@+id/EcodeFieldLayout"
24      android:layout_width="0dp"
25      android:layout_height="wrap_content"
26      android:layout_marginStart="8dp"
27      android:layout_marginTop="32dp"
28      android:layout_marginEnd="8dp"
29      android:orientation="horizontal"
30      app:layout_constraintEnd_toEndOf="parent"
31      app:layout_constraintStart_toStartOf="parent"
32      app:layout_constraintTop_toBottomOf="@+id/Header">
33
34      <TextView
35         android:id="@+id/ECodeLabel"
36         android:layout_width="0dp"
37         android:layout_height="wrap_content"
38         android:layout_weight="1"
39         android:fontFamily="@font/roboto_medium"
40         android:text="Employee Code"
41         android:textColor="@color/purple_500"
42         android:textSize="16sp" />
43
44      <EditText
45         android:id="@+id/eCodeEditTxt"
46         android:layout_width="0dp"
47         android:layout_height="wrap_content"
```

```

48         android:layout_weight="1"
49         android:ems="10"
50         android:hint="E0000"
51         android:inputType="textPersonName"
52         android:textColor="@color/purple_700"
53         android:fontFamily="@font/roboto_medium"
54         android:textSize="16sp" />
55     </LinearLayout>
56
57     <LinearLayout
58         android:id="@+id/NameFieldLayout"
59         android:layout_width="0dp"
60         android:layout_height="wrap_content"
61         android:layout_marginStart="8dp"
62         android:layout_marginTop="32dp"
63         android:layout_marginEnd="8dp"
64         android:orientation="horizontal"
65         app:layout_constraintEnd_toEndOf="parent"
66         app:layout_constraintStart_toStartOf="parent"
67         app:layout_constraintTop_toBottomOf="@+id/EcodeFieldLayout">
68
69         <TextView
70             android:id="@+id/nameLabel"
71             android:layout_width="0dp"
72             android:layout_height="wrap_content"
73             android:layout_weight="1"
74             android:fontFamily="@font/roboto_medium"
75             android:text="Name"
76             android:textColor="@color/purple_500"
77             android:textSize="16sp" />
78
79         <TextView
80             android:id="@+id/nameText"
81             android:layout_width="0dp"
82             android:layout_height="wrap_content"
83             android:layout_weight="2"
84             android:ems="10"
85             android:textColor="@color/purple_700"
86             android:fontFamily="@font/roboto_medium"
87             android:textSize="16sp" />
88     </LinearLayout>
89
90     <LinearLayout
91         android:id="@+id/genderFieldLayout"
92         android:layout_width="0dp"
93         android:layout_height="wrap_content"
94         android:layout_marginStart="8dp"
95         android:layout_marginTop="32dp"
96         android:layout_marginEnd="8dp"
97         app:layout_constraintEnd_toEndOf="parent"
98         app:layout_constraintStart_toStartOf="parent"
99         app:layout_constraintTop_toBottomOf="@+id/NameFieldLayout">
100

```

```

101     <TextView
102         android:id="@+id/genderLabel"
103         android:layout_width="0dp"
104         android:layout_height="wrap_content"
105         android:layout_weight="1"
106         android:fontFamily="@font/roboto_medium"
107         android:text="Gender"
108         android:textColor="@color/purple_500"
109         android:textSize="16sp" />
110
111     <TextView
112         android:id="@+id/genderText"
113         android:layout_width="0dp"
114         android:layout_height="wrap_content"
115         android:layout_weight="2"
116         android:ems="10"
117         android:textColor="@color/purple_700"
118         android:fontFamily="@font/roboto_medium"
119         android:textSize="16sp" />
120
121 </LinearLayout>
122
123 <LinearLayout
124     android:id="@+id/departmentFieldLayout"
125     android:layout_width="0dp"
126     android:layout_height="wrap_content"
127     android:layout_marginStart="8dp"
128     android:layout_marginTop="32dp"
129     android:layout_marginEnd="8dp"
130     android:orientation="horizontal"
131     app:layout_constraintEnd_toEndOf="parent"
132     app:layout_constraintStart_toStartOf="parent"
133     app:layout_constraintTop_toBottomOf="@+id/genderFieldLayout">
134
135     <TextView
136         android:id="@+id/departmentLabel"
137         android:layout_width="0dp"
138         android:layout_height="wrap_content"
139         android:layout_weight="1"
140         android:fontFamily="@font/roboto_medium"
141         android:text="Department"
142         android:textColor="@color/purple_500"
143         android:textSize="16sp" />
144
145     <TextView
146         android:id="@+id/departmentText"
147         android:layout_width="0dp"
148         android:layout_height="wrap_content"
149         android:layout_weight="2"
150         android:ems="10"
151         android:textColor="@color/purple_700"
152         android:fontFamily="@font/roboto_medium"
153         android:textSize="16sp" />

```



```

154
155 </LinearLayout>
156
157 <LinearLayout
158     android:id="@+id/salaryFieldLayout"
159     android:layout_width="0dp"
160     android:layout_height="wrap_content"
161     android:layout_marginStart="8dp"
162     android:layout_marginTop="32dp"
163     android:layout_marginEnd="8dp"
164     android:orientation="horizontal"
165     app:layout_constraintEnd_toEndOf="parent"
166     app:layout_constraintStart_toStartOf="parent"
167     app:layout_constraintTop_toBottomOf="@+id/departmentFieldLayout"
168
169 >
170
171     <TextView
172         android:id="@+id/salaryLabel"
173         android:layout_width="0dp"
174         android:layout_height="wrap_content"
175         android:layout_weight="1"
176         android:fontFamily="@font/roboto_medium"
177         android:text="Salary"
178         android:textColor="@color/purple_500"
179         android:textSize="16sp" />
180
181     <TextView
182         android:id="@+id/salaryText"
183         android:layout_width="0dp"
184         android:layout_height="wrap_content"
185         android:layout_weight="2"
186         android:ems="10"
187         android:textColor="@color/purple_700"
188         android:fontFamily="@font/roboto_medium"
189         android:textSize="16sp" />
190
191 </LinearLayout>
192
193 <Button
194     android:id="@+id/retrieveBtn"
195     android:layout_width="wrap_content"
196     android:layout_height="wrap_content"
197     android:layout_marginTop="32dp"
198     android:fontFamily="@font/roboto_bold"
199     android:text="Retrieve Details"
200     app:layout_constraintEnd_toEndOf="parent"
201     app:layout_constraintStart_toStartOf="parent"
202     app:layout_constraintTop_toBottomOf="@+id/salaryFieldLayout" />
203
204 <Button
205     android:id="@+id/deleteRecordBtn"
206     android:layout_width="wrap_content"
207     android:layout_height="wrap_content"

```

```
206     android:layout_marginTop="8dp"
207     android:fontFamily="@font/roboto_bold"
208     android:text="Delete Record"
209     app:layout_constraintEnd_toEndOf="parent"
210     app:layout_constraintStart_toStartOf="parent"
211     app:layout_constraintTop_toBottomOf="@+id/retrieveBtn" />
212
213 </androidx.constraintlayout.widget.ConstraintLayout>
```

Java (DeleteActivity.java)

```
1 package com.madlab.databaseoperations;
2
3 import androidx.appcompat.app.AppCompatActivity;
4
5 import android.os.Bundle;
6 import android.text.TextUtils;
7 import android.view.View;
8 import android.widget.Button;
9 import android.widget.EditText;
10 import android.widget.TextView;
11 import android.widget.Toast;
12
13 public class DeleteActivity extends AppCompatActivity {
14
15     @Override
16     protected void onCreate(Bundle savedInstanceState) {
17         super.onCreate(savedInstanceState);
18         setContentView(R.layout.activity_delete);
19
20         final EditText eCodeText = findViewById(R.id.eCodeEditTxt);
21         final TextView nameText = findViewById(R.id.nameText);
22         final TextView genderText = findViewById(R.id.genderText);
23         final TextView departmentText = findViewById(R.id.departmentText
24     );
25         final TextView salaryText = findViewById(R.id.salaryText);
26         final Button retrieveButton = findViewById(R.id.retrieveBtn);
27         final Button deleteRecordButton = findViewById(R.id.
28     deleteRecordBtn);
29
30         final EmployeeDatabaseHelper employeeDatabaseHelper = new
31     EmployeeDatabaseHelper(this);
32
33         retrieveButton.setOnClickListener(new View.OnClickListener() {
34             @Override
35             public void onClick(View view) {
36                 String eCode = eCodeText.getText().toString();
37
38                 if(TextUtils.isEmpty(eCode)) {
39                     Toast toast = Toast.makeText(DeleteActivity.this, "
40     Enter a valid Employee Code!", Toast.LENGTH_SHORT);
41                     toast.show();
42                     return;
43                 }
44
45                 String[] results = employeeDatabaseHelper.retrieveRecord
46     (eCode);
47
48                 if(results == null) {
49                     Toast toast = Toast.makeText(DeleteActivity.this, "
50     No employee with that Code!", Toast.LENGTH_SHORT);
51                     toast.show();
52                 }
53             }
54         });
55     }
56 }
```

```

46         } else {
47             nameText.setText(results[0]);
48             genderText.setText(results[1]);
49             departmentText.setText(results[2]);
50             salaryText.setText("Rs. " + results[3]);
51         }
52     }
53 });
54
55 deleteRecordButton.setOnClickListener(new View.OnClickListener()
56 {
57     @Override
58     public void onClick(View view) {
59         String eCode = eCodeText.getText().toString();
60
61         if(TextUtils.isEmpty(eCode)) {
62             Toast toast = Toast.makeText(DeleteActivity.this, "
63 Enter a valid Employee Code!", Toast.LENGTH_SHORT);
64             toast.show();
65             return;
66         }
67
68         String[] results = employeeDatabaseHelper.retrieveRecord
69 (eCode);
70
71         if(results == null) {
72             Toast toast = Toast.makeText(DeleteActivity.this, "
73 No employee with that Code!", Toast.LENGTH_SHORT);
74             toast.show();
75         } else {
76             int status = employeeDatabaseHelper.deleteRecord(
77 eCode);
78
79             if(status > 0) {
80                 Toast toast = Toast.makeText(DeleteActivity.this
81 , "Record Deleted Successfully", Toast.LENGTH_SHORT);
82                 toast.show();
83             } else {
84                 Toast toast = Toast.makeText(DeleteActivity.this
85 , "An Error Occurred", Toast.LENGTH_SHORT);
86                 toast.show();
87             }
88         }
89     }
90 });
91 }
92 }

```

Retrieve (By Employee Code) Activity

XML (activity_retrieve_ecode.xml)

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://
  //schemas.android.com/apk/res/android"
3   xmlns:app="http://schemas.android.com/apk/res-auto"
4   xmlns:tools="http://schemas.android.com/tools"
5   android:layout_width="match_parent"
6   android:layout_height="match_parent"
7   tools:context=".RetrieveECodeActivity">
8
9   <TextView
10     android:id="@+id/Header"
11     android:layout_width="wrap_content"
12     android:layout_height="wrap_content"
13     android:layout_marginTop="32dp"
14     android:fontFamily="@font/roboto_bold"
15     android:text="Retrieve using Employee Code"
16     android:textColor="@color/design_default_color_error"
17     android:textSize="20sp"
18     app:layout_constraintEnd_toEndOf="parent"
19     app:layout_constraintStart_toStartOf="parent"
20     app:layout_constraintTop_toTopOf="parent" />
21
22   <LinearLayout
23     android:id="@+id/EcodeFieldLayout"
24     android:layout_width="0dp"
25     android:layout_height="wrap_content"
26     android:layout_marginStart="8dp"
27     android:layout_marginTop="32dp"
28     android:layout_marginEnd="8dp"
29     android:orientation="horizontal"
30     app:layout_constraintEnd_toEndOf="parent"
31     app:layout_constraintStart_toStartOf="parent"
32     app:layout_constraintTop_toBottomOf="@+id/Header">
33
34     <TextView
35       android:id="@+id/ECodeLabel"
36       android:layout_width="0dp"
37       android:layout_height="wrap_content"
38       android:layout_weight="1"
39       android:fontFamily="@font/roboto_medium"
40       android:text="Employee Code"
41       android:textColor="@color/purple_500"
42       android:textSize="16sp" />
43
44     <EditText
45       android:id="@+id/eCodeEditTxt"
46       android:layout_width="0dp"
47       android:layout_height="wrap_content"
```

```

48         android:layout_weight="1"
49         android:ems="10"
50         android:hint="E0000"
51         android:inputType="textPersonName"
52         android:textColor="@color/purple_700"
53         android:fontFamily="@font/roboto_medium"
54         android:textSize="16sp" />
55     </LinearLayout>
56
57     <LinearLayout
58         android:id="@+id/NameFieldLayout"
59         android:layout_width="0dp"
60         android:layout_height="wrap_content"
61         android:layout_marginStart="8dp"
62         android:layout_marginTop="32dp"
63         android:layout_marginEnd="8dp"
64         android:orientation="horizontal"
65         app:layout_constraintEnd_toEndOf="parent"
66         app:layout_constraintStart_toStartOf="parent"
67         app:layout_constraintTop_toBottomOf="@+id/EcodeFieldLayout">
68
69         <TextView
70             android:id="@+id/nameLabel"
71             android:layout_width="0dp"
72             android:layout_height="wrap_content"
73             android:layout_weight="1"
74             android:fontFamily="@font/roboto_medium"
75             android:text="Name"
76             android:textColor="@color/purple_500"
77             android:textSize="16sp" />
78
79         <TextView
80             android:id="@+id/nameText"
81             android:layout_width="0dp"
82             android:layout_height="wrap_content"
83             android:layout_weight="2"
84             android:ems="10"
85             android:textColor="@color/purple_700"
86             android:fontFamily="@font/roboto_medium"
87             android:textSize="16sp" />
88     </LinearLayout>
89
90     <LinearLayout
91         android:id="@+id/genderFieldLayout"
92         android:layout_width="0dp"
93         android:layout_height="wrap_content"
94         android:layout_marginStart="8dp"
95         android:layout_marginTop="32dp"
96         android:layout_marginEnd="8dp"
97         app:layout_constraintEnd_toEndOf="parent"
98         app:layout_constraintStart_toStartOf="parent"
99         app:layout_constraintTop_toBottomOf="@+id/NameFieldLayout">
100

```

```

101     <TextView
102         android:id="@+id/genderLabel"
103         android:layout_width="0dp"
104         android:layout_height="wrap_content"
105         android:layout_weight="1"
106         android:fontFamily="@font/roboto_medium"
107         android:text="Gender"
108         android:textColor="@color/purple_500"
109         android:textSize="16sp" />
110
111     <TextView
112         android:id="@+id/genderText"
113         android:layout_width="0dp"
114         android:layout_height="wrap_content"
115         android:layout_weight="2"
116         android:ems="10"
117         android:textColor="@color/purple_700"
118         android:fontFamily="@font/roboto_medium"
119         android:textSize="16sp" />
120
121 </LinearLayout>
122
123 <LinearLayout
124     android:id="@+id/departmentFieldLayout"
125     android:layout_width="0dp"
126     android:layout_height="wrap_content"
127     android:layout_marginStart="8dp"
128     android:layout_marginTop="32dp"
129     android:layout_marginEnd="8dp"
130     android:orientation="horizontal"
131     app:layout_constraintEnd_toEndOf="parent"
132     app:layout_constraintStart_toStartOf="parent"
133     app:layout_constraintTop_toBottomOf="@+id/genderFieldLayout">
134
135     <TextView
136         android:id="@+id/departmentLabel"
137         android:layout_width="0dp"
138         android:layout_height="wrap_content"
139         android:layout_weight="1"
140         android:fontFamily="@font/roboto_medium"
141         android:text="Department"
142         android:textColor="@color/purple_500"
143         android:textSize="16sp" />
144
145     <TextView
146         android:id="@+id/departmentText"
147         android:layout_width="0dp"
148         android:layout_height="wrap_content"
149         android:layout_weight="2"
150         android:ems="10"
151         android:textColor="@color/purple_700"
152         android:fontFamily="@font/roboto_medium"
153         android:textSize="16sp" />

```

```

154
155 </LinearLayout>
156
157 <LinearLayout
158     android:id="@+id/salaryFieldLayout"
159     android:layout_width="0dp"
160     android:layout_height="wrap_content"
161     android:layout_marginStart="8dp"
162     android:layout_marginTop="32dp"
163     android:layout_marginEnd="8dp"
164     android:orientation="horizontal"
165     app:layout_constraintEnd_toEndOf="parent"
166     app:layout_constraintStart_toStartOf="parent"
167     app:layout_constraintTop_toBottomOf="@+id/departmentFieldLayout"
168
169 >
170
171     <TextView
172         android:id="@+id/salaryLabel"
173         android:layout_width="0dp"
174         android:layout_height="wrap_content"
175         android:layout_weight="1"
176         android:fontFamily="@font/roboto_medium"
177         android:text="Salary"
178         android:textColor="@color/purple_500"
179         android:textSize="16sp" />
180
181     <TextView
182         android:id="@+id/salaryText"
183         android:layout_width="0dp"
184         android:layout_height="wrap_content"
185         android:layout_weight="2"
186         android:ems="10"
187         android:textColor="@color/purple_700"
188         android:fontFamily="@font/roboto_medium"
189         android:textSize="16sp" />
190
191 </LinearLayout>
192
193 <Button
194     android:id="@+id/retrieveBtn"
195     android:layout_width="wrap_content"
196     android:layout_height="wrap_content"
197     android:layout_marginTop="32dp"
198     android:fontFamily="@font/roboto_bold"
199     android:text="Retrieve Record"
200     app:layout_constraintEnd_toEndOf="parent"
201     app:layout_constraintStart_toStartOf="parent"
202     app:layout_constraintTop_toBottomOf="@+id/salaryFieldLayout" />
203
204 </androidx.constraintlayout.widget.ConstraintLayout>

```


Java (RetrieveECodeActivity.java)

```
1 package com.madlab.databaseoperations;
2
3 import androidx.appcompat.app.AppCompatActivity;
4
5 import android.os.Bundle;
6 import android.text.TextUtils;
7 import android.view.View;
8 import android.widget.Button;
9 import android.widget.EditText;
10 import android.widget.TextView;
11 import android.widget.Toast;
12
13 public class RetrieveECodeActivity extends AppCompatActivity {
14
15     @Override
16     protected void onCreate(Bundle savedInstanceState) {
17         super.onCreate(savedInstanceState);
18         setContentView(R.layout.activity_retrieve_ecode);
19
20         final EditText eCodeText = findViewById(R.id.eCodeEditTxt);
21         final TextView nameText = findViewById(R.id.nameText);
22         final TextView genderText = findViewById(R.id.genderText);
23         final TextView departmentText = findViewById(R.id.departmentText
24 );
25         final TextView salaryText = findViewById(R.id.salaryText);
26         final Button retrieveButton = findViewById(R.id.retrieveBtn);
27
28         final EmployeeDatabaseHelper employeeDatabaseHelper = new
29 EmployeeDatabaseHelper(this);
30
31         retrieveButton.setOnClickListener(new View.OnClickListener() {
32             @Override
33             public void onClick(View view) {
34                 String eCode = eCodeText.getText().toString();
35
36                 if(TextUtils.isEmpty(eCode)) {
37                     Toast toast = Toast.makeText(RetrieveECodeActivity.
38 this, "Enter a valid Employee Code!", Toast.LENGTH_SHORT);
39                     toast.show();
40                     return;
41                 }
42
43                 String[] results = employeeDatabaseHelper.retrieveRecord
44 (eCode);
45
46                 if(results == null) {
47                     Toast toast = Toast.makeText(RetrieveECodeActivity.
48 this, "No employee with that Code!", Toast.LENGTH_SHORT);
49                     toast.show();
50                 } else {
51                     nameText.setText(results[0]);
52                 }
53             }
54         });
55     }
56 }
```

```
47         genderText.setText(results[1]);
48         departmentText.setText(results[2]);
49         salaryText.setText("Rs. " + results[3]);
50     }
51 }
52 });
53 }
54 }
```

Retrieve (By Department) Activity

XML (activity_retrieve_department.xml)

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://
  //schemas.android.com/apk/res/android"
3   xmlns:app="http://schemas.android.com/apk/res-auto"
4   xmlns:tools="http://schemas.android.com/tools"
5   android:layout_width="match_parent"
6   android:layout_height="match_parent"
7   tools:context=".RetrieveDepartmentActivity">
8
9   <TextView
10      android:id="@+id/Header"
11      android:layout_width="wrap_content"
12      android:layout_height="wrap_content"
13      android:layout_marginTop="32dp"
14      android:fontFamily="@font/roboto_bold"
15      android:text="Retrieve using Departments"
16      android:textColor="@color/design_default_color_error"
17      android:textSize="20sp"
18      app:layout_constraintEnd_toEndOf="parent"
19      app:layout_constraintStart_toStartOf="parent"
20      app:layout_constraintTop_toTopOf="parent" />
21
22   <LinearLayout
23      android:id="@+id/departmentFieldLayout"
24      android:layout_width="0dp"
25      android:layout_height="wrap_content"
26      android:layout_marginStart="8dp"
27      android:layout_marginTop="32dp"
28      android:layout_marginEnd="8dp"
29      android:orientation="horizontal"
30      app:layout_constraintEnd_toEndOf="parent"
31      app:layout_constraintStart_toStartOf="parent"
32      app:layout_constraintTop_toBottomOf="@+id/Header">
33
34      <TextView
35         android:id="@+id/departmentLabel"
36         android:layout_width="0dp"
37         android:layout_height="wrap_content"
38         android:layout_weight="1"
39         android:fontFamily="@font/roboto_medium"
40         android:text="Department"
41         android:textColor="@color/purple_500"
42         android:textSize="16sp" />
43
44      <Spinner
45         android:id="@+id/departmentSpinner"
46         android:layout_width="0dp"
47         android:layout_height="wrap_content"
```

```

48         android:layout_weight="2"
49         android:entries="@array/departments" />
50
51     </LinearLayout>
52
53     <LinearLayout
54         android:id="@+id/EcodeFieldLayout"
55         android:layout_width="0dp"
56         android:layout_height="wrap_content"
57         android:layout_marginStart="8dp"
58         android:layout_marginTop="32dp"
59         android:layout_marginEnd="8dp"
60         android:orientation="horizontal"
61         app:layout_constraintEnd_toEndOf="parent"
62         app:layout_constraintStart_toStartOf="parent"
63         app:layout_constraintTop_toBottomOf="@+id/departmentFieldLayout"
64     >
65
66         <TextView
67             android:id="@+id/ECodeLabel"
68             android:layout_width="0dp"
69             android:layout_height="wrap_content"
70             android:layout_weight="1"
71             android:fontFamily="@font/roboto_medium"
72             android:text="Employee Code"
73             android:textColor="@color/purple_500"
74             android:textSize="16sp" />
75
76         <TextView
77             android:id="@+id/eCodeTxt"
78             android:layout_width="0dp"
79             android:layout_height="wrap_content"
80             android:layout_weight="1"
81             android:ems="10"
82             android:fontFamily="@font/roboto_medium"
83             android:textColor="@color/purple_700"
84             android:textSize="16sp" />
85     </LinearLayout>
86
87     <LinearLayout
88         android:id="@+id/NameFieldLayout"
89         android:layout_width="0dp"
90         android:layout_height="wrap_content"
91         android:layout_marginStart="8dp"
92         android:layout_marginTop="32dp"
93         android:layout_marginEnd="8dp"
94         android:orientation="horizontal"
95         app:layout_constraintEnd_toEndOf="parent"
96         app:layout_constraintStart_toStartOf="parent"
97         app:layout_constraintTop_toBottomOf="@+id/EcodeFieldLayout"
98     >
99
100         <TextView
101             android:id="@+id/nameLabel"

```

```

100         android:layout_width="0dp"
101         android:layout_height="wrap_content"
102         android:layout_weight="1"
103         android:fontFamily="@font/roboto_medium"
104         android:text="Name"
105         android:textColor="@color/purple_500"
106         android:textSize="16sp" />
107
108     <TextView
109         android:id="@+id/nameText"
110         android:layout_width="0dp"
111         android:layout_height="wrap_content"
112         android:layout_weight="2"
113         android:ems="10"
114         android:textColor="@color/purple_700"
115         android:fontFamily="@font/roboto_medium"
116         android:textSize="16sp" />
117 </LinearLayout>
118
119 <LinearLayout
120     android:id="@+id/genderFieldLayout"
121     android:layout_width="0dp"
122     android:layout_height="wrap_content"
123     android:layout_marginStart="8dp"
124     android:layout_marginTop="32dp"
125     android:layout_marginEnd="8dp"
126     app:layout_constraintEnd_toEndOf="parent"
127     app:layout_constraintStart_toStartOf="parent"
128     app:layout_constraintTop_toBottomOf="@+id/NameFieldLayout">
129
130     <TextView
131         android:id="@+id/genderLabel"
132         android:layout_width="0dp"
133         android:layout_height="wrap_content"
134         android:layout_weight="1"
135         android:fontFamily="@font/roboto_medium"
136         android:text="Gender"
137         android:textColor="@color/purple_500"
138         android:textSize="16sp" />
139
140     <TextView
141         android:id="@+id/genderText"
142         android:layout_width="0dp"
143         android:layout_height="wrap_content"
144         android:layout_weight="2"
145         android:ems="10"
146         android:textColor="@color/purple_700"
147         android:fontFamily="@font/roboto_medium"
148         android:textSize="16sp" />
149
150 </LinearLayout>
151
152 <LinearLayout

```

```

153     android:id="@+id/salaryFieldLayout "
154     android:layout_width="0dp"
155     android:layout_height="wrap_content "
156     android:layout_marginStart="8dp"
157     android:layout_marginTop="32dp"
158     android:layout_marginEnd="8dp"
159     android:orientation="horizontal "
160     app:layout_constraintEnd_toEndOf="parent "
161     app:layout_constraintStart_toStartOf="parent "
162     app:layout_constraintTop_toBottomOf="@+id/genderFieldLayout ">
163
164     <TextView
165         android:id="@+id/salaryLabel "
166         android:layout_width="0dp"
167         android:layout_height="wrap_content "
168         android:layout_weight="1"
169         android:fontFamily="@font/roboto_medium"
170         android:text="Salary"
171         android:textColor="@color/purple_500"
172         android:textSize="16sp" />
173
174     <TextView
175         android:id="@+id/salaryText "
176         android:layout_width="0dp"
177         android:layout_height="wrap_content "
178         android:layout_weight="2"
179         android:ems="10"
180         android:textColor="@color/purple_700"
181         android:fontFamily="@font/roboto_medium"
182         android:textSize="16sp" />
183
184 </LinearLayout>
185
186 <Button
187     android:id="@+id/retrieveBtn "
188     android:layout_width="wrap_content "
189     android:layout_height="wrap_content "
190     android:layout_marginTop="32dp"
191     android:fontFamily="@font/roboto_bold"
192     android:text="Retrieve Records"
193     app:layout_constraintEnd_toEndOf="parent "
194     app:layout_constraintStart_toStartOf="parent "
195     app:layout_constraintTop_toBottomOf="@+id/salaryFieldLayout " />
196
197 <Button
198     android:id="@+id/prevBtn "
199     android:layout_width="wrap_content "
200     android:layout_height="wrap_content "
201     android:layout_marginStart="32dp"
202     android:layout_marginTop="8dp"
203     android:fontFamily="@font/roboto_bold"
204     android:text="Prev "
205     app:layout_constraintStart_toStartOf="parent "

```

```
206         app:layout_constraintTop_toBottomOf="@+id/retrieveBtn" />
207
208     <Button
209         android:id="@+id/nextBtn"
210         android:layout_width="wrap_content"
211         android:layout_height="wrap_content"
212         android:layout_marginEnd="32dp"
213         android:layout_marginTop="8dp"
214         android:fontFamily="@font/roboto_bold"
215         android:text="Next"
216         app:layout_constraintEnd_toEndOf="parent"
217         app:layout_constraintTop_toBottomOf="@+id/retrieveBtn" />
218
219 </androidx.constraintlayout.widget.ConstraintLayout>
```

Java (RetrieveDepartmentActivity.java)

```
1 package com.madlab.databaseoperations;
2
3 import androidx.annotation.RequiresApi;
4 import androidx.appcompat.app.AppCompatActivity;
5
6 import android.database.Cursor;
7 import android.os.Build;
8 import android.os.Bundle;
9 import android.text.TextUtils;
10 import android.view.View;
11 import android.widget.Button;
12 import android.widget.EditText;
13 import android.widget.Spinner;
14 import android.widget.TextView;
15 import android.widget.Toast;
16
17 public class RetrieveDepartmentActivity extends AppCompatActivity {
18
19     @RequiresApi(api = Build.VERSION_CODES.M)
20
21     public void toggleButton(Button button, boolean enabled) {
22         button.setEnabled(enabled);
23
24         if(enabled) {
25             button.setBackgroundTintList(this.getResources().
26 getColorStateList(R.color.purple_500, this.getTheme()));
27         } else {
28             button.setBackgroundTintList(this.getResources().
29 getColorStateList(R.color.black, this.getTheme()));
30         }
31     }
32
33     Cursor results = null;
34
35     @Override
36     protected void onCreate(Bundle savedInstanceState) {
37         super.onCreate(savedInstanceState);
38         setContentView(R.layout.activity_retrieve_department);
39
40         final Spinner departmentSpinner = findViewById(R.id.
41 departmentSpinner);
42         final TextView eCodeText = findViewById(R.id.eCodeTxt);
43         final TextView nameText = findViewById(R.id.nameText);
44         final TextView genderText = findViewById(R.id.genderText);
45         final TextView salaryText = findViewById(R.id.salaryText);
46         final Button retrieveButton = findViewById(R.id.retrieveBtn);
47         final Button prevButton = findViewById(R.id.prevBtn);
48         final Button nextButton = findViewById(R.id.nextBtn);
49
50         // Disable the Prev and Next buttons
51         toggleButton(prevButton, false);
```



```

49         toggleButton(nextButton, false);
50
51         final EmployeeDatabaseHelper employeeDatabaseHelper = new
EmployeeDatabaseHelper(this);
52
53         retrieveButton.setOnClickListener(new View.OnClickListener() {
54             @Override
55             public void onClick(View view) { // Disable the Prev and Next
buttons
56                 toggleButton(prevButton, false);
57                 toggleButton(nextButton, false);
58
59                 String department = departmentSpinner.getSelectedItem().
toString();
60
61                 results = employeeDatabaseHelper.retrieveByDeptRecords(
department);
62
63                 if(results == null) {
64                     Toast toast = Toast.makeText(
RetrieveDepartmentActivity.this, "No employees in that department",
Toast.LENGTH_SHORT);
65                     toast.show();
66
67                     // Reset the text views
68                     eCodeText.setText("");
69                     nameText.setText("");
70                     genderText.setText("");
71                     salaryText.setText("");
72
73                     return;
74                 }
75
76                 // Move to the first record
77                 results.moveToFirst();
78
79                 // Set text views to the first record's values
80                 eCodeText.setText(results.getString(0));
81                 nameText.setText(results.getString(1));
82                 genderText.setText(results.getString(2));
83                 salaryText.setText("Rs. " + results.getString(3));
84
85                 // Enable the next button if the count is greater than 1
86                 if(results.getCount() > 1) {
87                     toggleButton(nextButton, true);
88                 }
89             }
90         });
91
92         nextButton.setOnClickListener(new View.OnClickListener() {
93             @Override
94             public void onClick(View view) {
95                 toggleButton(prevButton, true);

```

```

96         results.moveToNext();
97
98         // Set text views to the that record's values
99         eCodeText.setText(results.getString(0));
100        nameText.setText(results.getString(1));
101        genderText.setText(results.getString(2));
102        salaryText.setText("Rs. " + results.getString(3));
103
104        // If this is the last record
105        if(results.isLast()) {
106            toggleButton(nextButton, false);
107        }
108    }
109    });
110
111    prevButton.setOnClickListener(new View.OnClickListener() {
112        @Override
113        public void onClick(View view) {
114            toggleButton(nextButton, true);
115            results.moveToPrevious();
116
117            // Set text views to the that record's values
118            eCodeText.setText(results.getString(0));
119            nameText.setText(results.getString(1));
120            genderText.setText(results.getString(2));
121            salaryText.setText("Rs. " + results.getString(3));
122
123            // If this is the first record
124            if(results.isFirst()) {
125                toggleButton(prevButton, false);
126            }
127        }
128    });
129 }
130 }

```

Employee Database Helper Class

Java (EmployeeDatabaseHelper.java)

```
1 package com.madlab.databaseoperations;
2
3 import android.content.ContentValues;
4 import android.content.Context;
5 import android.database.Cursor;
6 import android.database.sqlite.SQLiteDatabase;
7 import android.database.sqlite.SQLiteOpenHelper;
8
9 import androidx.annotation.Nullable;
10
11 public class EmployeeDatabaseHelper extends SQLiteOpenHelper {
12     private static final String DB_NAME = "employees";
13     private static final int DB_VERSION = 1;
14
15     public EmployeeDatabaseHelper(@Nullable Context context) {
16         super(context, DB_NAME, null, DB_VERSION);
17     }
18
19     @Override
20     public void onCreate(SQLiteDatabase sqLiteDatabase) {
21         sqLiteDatabase.execSQL(
22             "CREATE TABLE IF NOT EXISTS EMPLOYEES (" +
23                 "ECODE TEXT PRIMARY KEY," +
24                 "NAME TEXT," +
25                 "GENDER TEXT," +
26                 "DEPARTMENT TEXT," +
27                 "SALARY NUMERIC" +
28             ");"
29         );
30     }
31
32     @Override
33     public void onUpgrade(SQLiteDatabase sqLiteDatabase, int oldVersion,
34         int newVersion) {
35         sqLiteDatabase.execSQL("DROP TABLE IF EXISTS EMPLOYEES;");
36         onCreate(sqLiteDatabase);
37     }
38
39     public void insertRecord(String eCode, String name, String gender,
40         String department, Double salary) {
41         SQLiteDatabase db = this.getWritableDatabase();
42         ContentValues record = new ContentValues();
43
44         record.put("ECODE", eCode);
45         record.put("NAME", name);
46         record.put("GENDER", gender);
47         record.put("DEPARTMENT", department);
48         record.put("SALARY", salary);
49     }
50 }
```

```

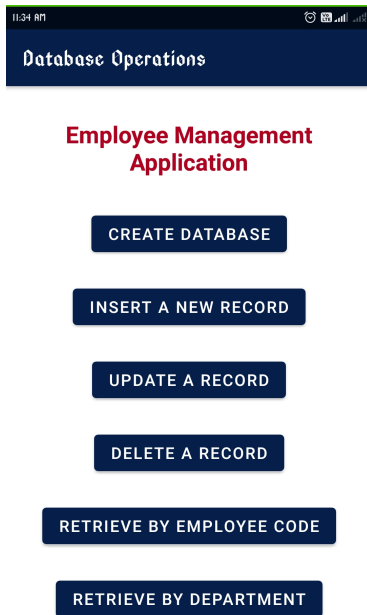
47         db.insertOrThrow("EMPLOYEES", null, record);
48     db.close();
49 }
50
51
52     public void updateRecord(String eCode, String name, String gender,
53 String department, Double salary) {
54         SQLiteDatabase db = this.getWritableDatabase();
55         ContentValues updatedRecord = new ContentValues();
56
57         updatedRecord.put("NAME", name);
58         updatedRecord.put("GENDER", gender);
59         updatedRecord.put("DEPARTMENT", department);
60         updatedRecord.put("SALARY", salary);
61
62         db.update("EMPLOYEES", updatedRecord, "ECODE = ?", new String[]
63 {eCode});
64     }
65
66     public String[] retrieveRecord(String eCode) {
67         SQLiteDatabase db = this.getReadableDatabase();
68         String[] values = new String[4];
69
70         Cursor cursor = db.query("EMPLOYEES", new String[] {"NAME", "
71 GENDER", "DEPARTMENT", "SALARY"}, "ECODE = ?", new String[] {eCode},
72 null, null, null);
73
74         if(cursor.moveToNext()) {
75             values[0] = cursor.getString(0);
76             values[1] = cursor.getString(1);
77             values[2] = cursor.getString(2);
78             values[3] = Double.toString(cursor.getDouble(3));
79         } else {
80             return null;
81         }
82
83         return values;
84     }
85
86     public int deleteRecord(String eCode){
87         SQLiteDatabase db = this.getWritableDatabase();
88
89         //Returns the number of rows affected
90         return db.delete("EMPLOYEES", "ECODE = ?", new String[] {eCode})
91 ;
92     }
93
94     public Cursor retrieveByDeptRecords(String department){
95         SQLiteDatabase db = this.getReadableDatabase();
96         Cursor cursor = db.query("EMPLOYEES", new String[] {"ECODE", "
97 NAME", "GENDER", "SALARY"}, "DEPARTMENT = ?", new String[] {
98 department}, null, null, null);
99
100     }

```

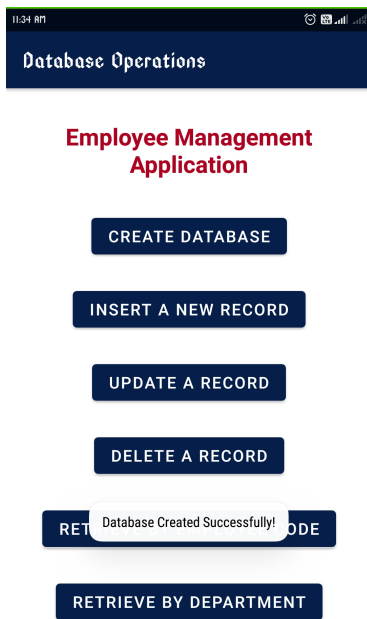
```
93         // If no records were retrieved
94         if(cursor.getCount() == 0){
95             return null;
96         }
97
98         return cursor;
99     }
100 }
```

App Screenshots

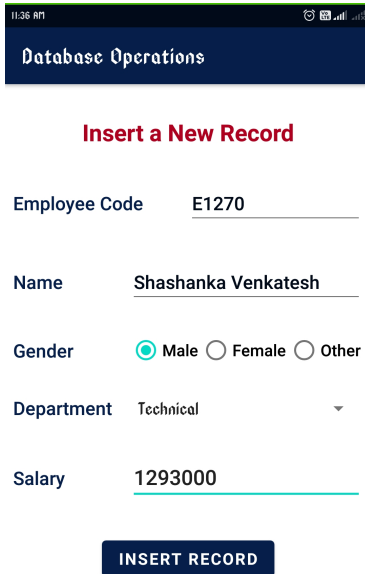
Home



Create Database



Inserting a Record



11:35 AM

Database Operations

Insert a New Record

Employee Code E1270

Name Shashanka Venkatesh

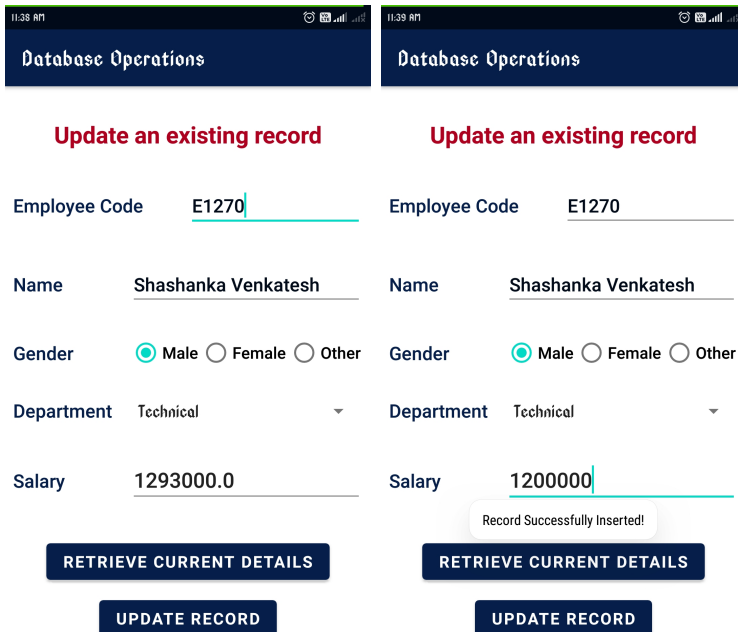
Gender ☒ Male ☐ Female ☐ Other

Department Technical

Salary 1293000

INSERT RECORD

Updating a Record



11:35 AM

Database Operations

Update an existing record

Employee Code E1270

Name Shashanka Venkatesh

Gender ☒ Male ☐ Female ☐ Other

Department Technical

Salary 1293000.0

RETRIEVE CURRENT DETAILS

UPDATE RECORD

11:35 AM

Database Operations

Update an existing record

Employee Code E1270

Name Shashanka Venkatesh

Gender ☒ Male ☐ Female ☐ Other

Department Technical

Salary 1200000

Record Successfully Inserted!

RETRIEVE CURRENT DETAILS

UPDATE RECORD

Deleting a Record

Database Operations

Delete using Employee Code

Employee Code

Name John Doe

Gender Male

Department Legal

Salary Rs. 2500000.0

RETRIEVE DETAILS

DELETE RECORD

Database Operations

Delete using Employee Code

Employee Code

Name John Doe

Gender Male

Department Legal

Salary Rs. 2500000.0

Record Deleted Successfully

DELETE RECORD

Retrieving a Record by Employee code

Database Operations

Retrieve using Employee Code

Employee Code

Name Shashanka Venkatesh

Gender Male

Department Technical

Salary Rs. 1200000.0

RETRIEVE RECORD

Retrieving Records by Department

Database Operations		Database Operations		Database Operations	
Retrieve using Departments		Retrieve using Departments		Retrieve using Departments	
Department	Technical	Department	Technical	Department	Technical
Employee Code	E1270	Employee Code	E0196	Employee Code	E0200
Name	Shashanka Venkatesh	Name	Vishakan Subramanian	Name	Vishnu K Krishnan
Gender	Male	Gender	Male	Gender	Male
Salary	Rs. 1200000	Salary	Rs. 1373000	Salary	Rs. 3281110
RETRIEVE RECORDS		RETRIEVE RECORDS		RETRIEVE RECORDS	
	NEXT	PREV	NEXT	PREV	