

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 );
26         final Button retrieveDeptBtn = findViewById(R.id.retrieveDeptBtn);
27
28         final SQLiteOpenHelper databaseHelper = new EmployeeDatabaseHelper
29 (this);
30
31         createBtn.setOnClickListener(new View.OnClickListener() {
32             @Override
33             public void onClick(View view) {
34                 try {
35                     SQLiteDatabase db = databaseHelper.getReadableDatabase
36 ();
37                     Toast toast = Toast.makeText(MainActivity.this, "
38 Database Created Successfully!", Toast.LENGTH_SHORT);
39                     toast.show();
40                 } catch (Exception e) {
41                     Toast toast = Toast.makeText(MainActivity.this, "
42 Database Unavailable!", Toast.LENGTH_SHORT);
43                     toast.show();
44                 }
45             }
46         });
47
48         insertBtn.setOnClickListener(new View.OnClickListener() {
49             @Override
```

```

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

```

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     <TextView
189         android:id="@+id/salaryLabel "
190         android:layout_width="0dp"
191         android:layout_height="wrap_content "
192         android:layout_weight="1"
193         android:fontFamily="@font/roboto_medium"
194         android:text="Salary "
195         android:textColor="@color/purple_500 "
196         android:textSize="16sp" />
197
198     <EditText
199         android:id="@+id/salaryEditTxt "

```

```

200         android:layout_width="0dp"
201         android:layout_height="wrap_content"
202         android:layout_weight="2"
203         android:ems="10"
204         android:fontFamily="@font/roboto_medium"
205         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     <TextView
189         android:id="@+id/salaryLabel "
190         android:layout_width="0dp"
191         android:layout_height="wrap_content "
192         android:layout_weight="1"
193         android:fontFamily="@font/roboto_medium"
194         android:text="Salary "
195         android:textColor="@color/purple_500 "
196         android:textSize="16sp" />
197
198     <EditText
199         android:id="@+id/salaryEditTxt "

```

```

200         android:layout_width="0dp"
201         android:layout_height="wrap_content"
202         android:layout_weight="2"
203         android:ems="10"
204         android:fontFamily="@font/roboto_medium"
205         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         <TextView
170             android:id="@+id/salaryLabel"
171             android:layout_width="0dp"
172             android:layout_height="wrap_content"
173             android:layout_weight="1"
174             android:fontFamily="@font/roboto_medium"
175             android:text="Salary"
176             android:textColor="@color/purple_500"
177             android:textSize="16sp" />
178
179         <TextView
180             android:id="@+id/salaryText"
181             android:layout_width="0dp"
182             android:layout_height="wrap_content"
183             android:layout_weight="2"
184             android:ems="10"
185             android:textColor="@color/purple_700"
186             android:fontFamily="@font/roboto_medium"
187             android:textSize="16sp" />
188
189     </LinearLayout>
190
191     <Button
192         android:id="@+id/retrieveBtn"
193         android:layout_width="wrap_content"
194         android:layout_height="wrap_content"
195         android:layout_marginTop="32dp"
196         android:fontFamily="@font/roboto_bold"
197         android:text="Retrieve Details"
198         app:layout_constraintEnd_toEndOf="parent"
199         app:layout_constraintStart_toStartOf="parent"

```

```

200         app:layout_constraintTop_toBottomOf="@+id/salaryFieldLayout" />
201
202     <Button
203         android:id="@+id/deleteRecordBtn"
204         android:layout_width="wrap_content"
205         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         final TextView salaryText = findViewById(R.id.salaryText);
25         final Button retrieveButton = findViewById(R.id.retrieveBtn);
26         final Button deleteRecordButton = findViewById(R.id.
deleteRecordBtn);
27
28         final EmployeeDatabaseHelper employeeDatabaseHelper = new
EmployeeDatabaseHelper(this);
29
30         retrieveButton.setOnClickListener(new View.OnClickListener() {
31             @Override
32             public void onClick(View view) {
33                 String eCode = eCodeText.getText().toString();
34
35                 if(TextUtils.isEmpty(eCode)) {
36                     Toast toast = Toast.makeText(DeleteActivity.this, "
Enter a valid Employee Code!", Toast.LENGTH_SHORT);
37                     toast.show();
38                     return;
39                 }
40
41                 String[] results = employeeDatabaseHelper.retrieveRecord(
eCode);
42
43                 if(results == null) {
44                     Toast toast = Toast.makeText(DeleteActivity.this, "No
employee with that Code!", Toast.LENGTH_SHORT);
```

```

45         toast.show();
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     @Override
57     public void onClick(View view) {
58         String eCode = eCodeText.getText().toString();
59
60         if(TextUtils.isEmpty(eCode)) {
61             Toast toast = Toast.makeText(DeleteActivity.this, "
Enter a valid Employee Code!", Toast.LENGTH_SHORT);
62             toast.show();
63             return;
64         }
65
66         String[] results = employeeDatabaseHelper.retrieveRecord(
eCode);
67
68         if(results == null) {
69             Toast toast = Toast.makeText(DeleteActivity.this, "No
employee with that Code!", Toast.LENGTH_SHORT);
70             toast.show();
71         } else {
72             int status = employeeDatabaseHelper.deleteRecord(eCode
);
73
74             if(status > 0) {
75                 Toast toast = Toast.makeText(DeleteActivity.this,
"Record Deleted Successfully", Toast.LENGTH_SHORT);
76                 toast.show();
77             } else {
78                 Toast toast = Toast.makeText(DeleteActivity.this,
"An Error Occurred", Toast.LENGTH_SHORT);
79                 toast.show();
80             }
81         }
82     });
83 }
84 }

```

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         <TextView
170             android:id="@+id/salaryLabel"
171             android:layout_width="0dp"
172             android:layout_height="wrap_content"
173             android:layout_weight="1"
174             android:fontFamily="@font/roboto_medium"
175             android:text="Salary"
176             android:textColor="@color/purple_500"
177             android:textSize="16sp" />
178
179         <TextView
180             android:id="@+id/salaryText"
181             android:layout_width="0dp"
182             android:layout_height="wrap_content"
183             android:layout_weight="2"
184             android:ems="10"
185             android:textColor="@color/purple_700"
186             android:fontFamily="@font/roboto_medium"
187             android:textSize="16sp" />
188
189     </LinearLayout>
190
191     <Button
192         android:id="@+id/retrieveBtn"
193         android:layout_width="wrap_content"
194         android:layout_height="wrap_content"
195         android:layout_marginTop="32dp"
196         android:fontFamily="@font/roboto_bold"
197         android:text="Retrieve Record"
198         app:layout_constraintEnd_toEndOf="parent"
199         app:layout_constraintStart_toStartOf="parent"

```

```
200         app:layout_constraintTop_toBottomOf="@+id/salaryFieldLayout" />
201
202 </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         final TextView salaryText = findViewById(R.id.salaryText);
25         final Button retrieveButton = findViewById(R.id.retrieveBtn);
26
27         final EmployeeDatabaseHelper employeeDatabaseHelper = new
EmployeeDatabaseHelper(this);
28
29         retrieveButton.setOnClickListener(new View.OnClickListener() {
30             @Override
31             public void onClick(View view) {
32                 String eCode = eCodeText.getText().toString();
33
34                 if(TextUtils.isEmpty(eCode)) {
35                     Toast toast = Toast.makeText(RetrieveECodeActivity.
this, "Enter a valid Employee Code!", Toast.LENGTH_SHORT);
36                     toast.show();
37                     return;
38                 }
39
40                 String[] results = employeeDatabaseHelper.retrieveRecord(
eCode);
41
42                 if(results == null) {
43                     Toast toast = Toast.makeText(RetrieveECodeActivity.
this, "No employee with that Code!", Toast.LENGTH_SHORT);
44                     toast.show();
45                 } else {
```

```
46         nameText.setText(results[0]);
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         <TextView
66             android:id="@+id/ECodeLabel "
67             android:layout_width="0dp"
68             android:layout_height="wrap_content "
69             android:layout_weight="1"
70             android:fontFamily="@font/roboto_medium"
71             android:text="Employee Code"
72             android:textColor="@color/purple_500 "
73             android:textSize="16sp" />
74
75         <TextView
76             android:id="@+id/eCodeTxt "
77             android:layout_width="0dp"
78             android:layout_height="wrap_content "
79             android:layout_weight="1"
80             android:ems="10 "
81             android:fontFamily="@font/roboto_medium"
82             android:textColor="@color/purple_700 "
83             android:textSize="16sp" />
84     </LinearLayout>
85
86     <LinearLayout
87         android:id="@+id/NameFieldLayout "
88         android:layout_width="0dp"
89         android:layout_height="wrap_content "
90         android:layout_marginStart="8dp"
91         android:layout_marginTop="32dp"
92         android:layout_marginEnd="8dp"
93         android:orientation="horizontal "
94         app:layout_constraintEnd_toEndOf="parent "
95         app:layout_constraintStart_toStartOf="parent "
96         app:layout_constraintTop_toBottomOf="@+id/EcodeFieldLayout">
97

```

```

98     <TextView
99         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);
```

```

47         // Disable the Prev and Next buttons
48         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);
```

```

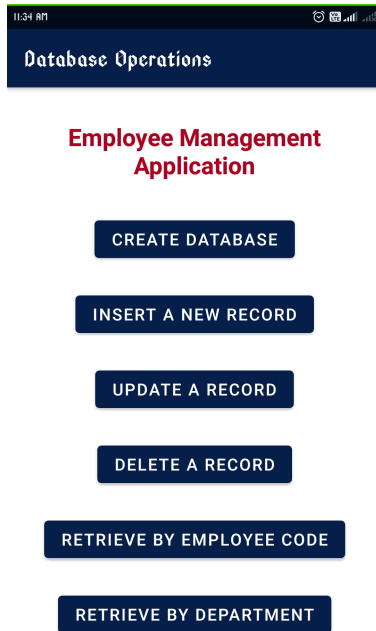
46         record.put("SALARY", salary);
47
48         db.insertOrThrow("EMPLOYEES", null, record);
49         db.close();
50     }
51
52     public void updateRecord(String eCode, String name, String gender,
53 String department, Double salary) {
54         SQLiteDatabase db = this.getWritableDatabase();
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     public Cursor retrieveByDeptRecords(String department){
94         SQLiteDatabase db = this.getReadableDatabase();
95         Cursor cursor = db.query("EMPLOYEES", new String[] {"ECODE", "NAME
96 ", "GENDER", "SALARY"}, "DEPARTMENT = ?", new String[] {department},

```

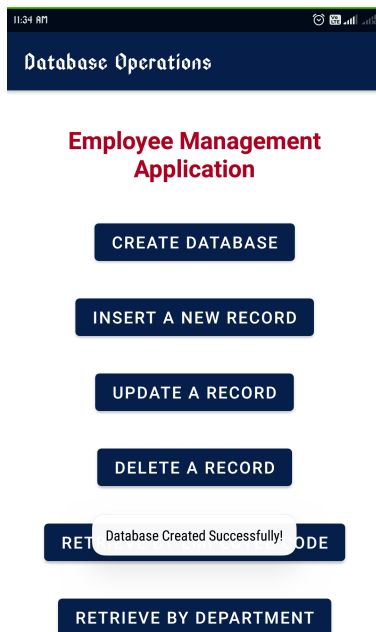
```
    null, null, null);
92
93     // If no records were retrieved
94     if(cursor.getCount() == 0){
95         return null;
96     }
97
98     return cursor;
99 }
100 }
```

App Screenshots

Home



Create Database



Inserting a Record



Insert a New Record

Employee Code

Name

Gender ☒ Male ☐ Female ☐ Other

Department

Salary

Updating a Record



Update an existing record

Employee Code

Name

Gender ☒ Male ☐ Female ☐ Other

Department

Salary



Update an existing record

Employee Code

Name

Gender ☒ Male ☐ Female ☐ Other

Department

Salary

Record Successfully Inserted!

Deleting a Record

11:41 AM

Database Operations

Delete using Employee Code

Employee Code E1000

Name John Doe

Gender Male

Department Legal

Salary Rs. 2500000.0

RETRIEVE DETAILS

DELETE RECORD

11:41 AM

Database Operations

Delete using Employee Code

Employee Code E1000

Name John Doe

Gender Male

Department Legal

Salary Rs. 2500000.0

Record Deleted Successfully

DELETE RECORD

Retrieving a Record by Employee code

11:42 AM

Database Operations

Retrieve using Employee Code

Employee Code E1270

Name Shashanka Venkatesh

Gender Male

Department Technical

Salary Rs. 1200000.0

RETRIEVE RECORD

Retrieving Records by Department

Database Operations	
Retrieve using Departments	
Department	Technical
Employee Code	E1270
Name	Shashanka Venkatesh
Gender	Male
Salary	Rs. 1200000
RETRIEVE RECORDS	
	NEXT

Database Operations	
Retrieve using Departments	
Department	Technical
Employee Code	E0196
Name	Vishakan Subramanian
Gender	Male
Salary	Rs. 1373000
RETRIEVE RECORDS	
PREV	NEXT

Database Operations	
Retrieve using Departments	
Department	Technical
Employee Code	E0200
Name	Vishnu K Krishnan
Gender	Male
Salary	Rs. 3281110
RETRIEVE RECORDS	
PREV	