8. Develop an application in android that makes use of notification manager.

Activity_main.xml:

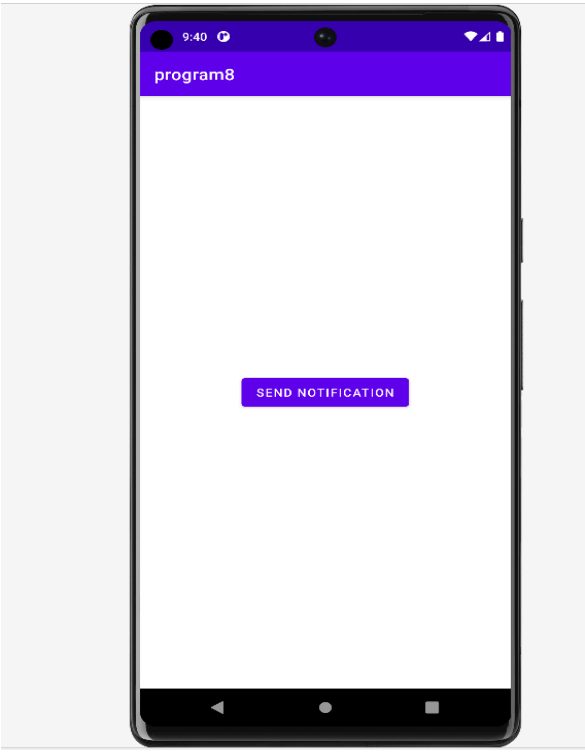
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:padding="16dp"
  tools:context=".MainActivity">
   <Button
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_centerInParent="true"
     android:text="Send Notification"
     android:onClick="sendNotification"/>
</RelativeLayout>
```

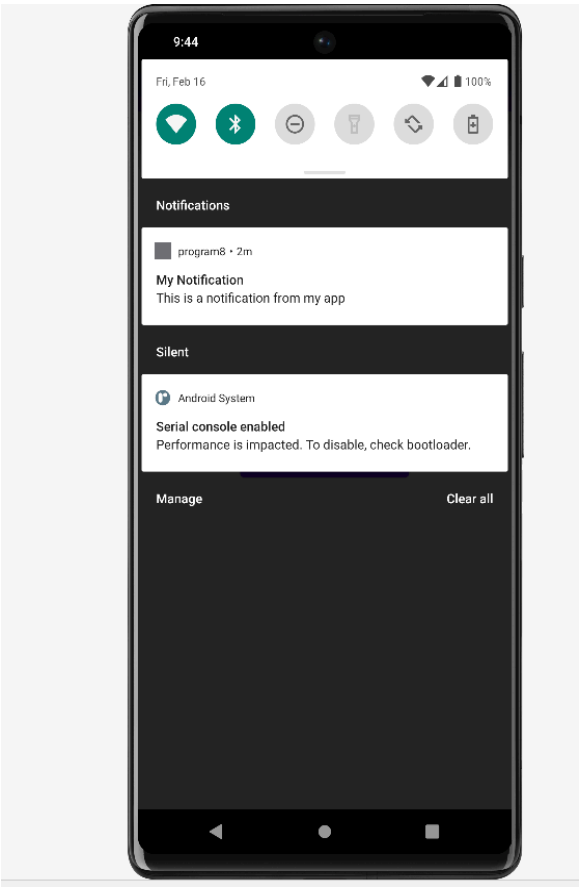
MainActivity.java:

```
package com.example.program8;
import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.content.Context;
import android.os.Build;
import android.os.Bundle;
import android.view.View;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.NotificationCompat;
import com.example.program8.R;

public class MainActivity extends AppCompatActivity {

  private static final String CHANNEL_ID = "my_channel";
  private static final CharSequence CHANNEL_NAME = "My Channel";
  private static final String CHANNEL_DESCRIPTION = "This is my notification channel";

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

     createNotificationChannel();
  }

  private void createNotificationChannel() {
     if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
        NotificationChannel channel = new NotificationChannel(
              CHANNEL_ID,
              CHANNEL_NAME,
              NotificationManager.IMPORTANCE_DEFAULT);
        channel.setDescription(CHANNEL_DESCRIPTION);
```

```
        NotificationManager notificationManager = getSystemService(NotificationManager.class);
        notificationManager.createNotificationChannel(channel);
    }
  }

  public void sendNotification(View view) {
    NotificationCompat.Builder builder = new NotificationCompat.Builder(this, CHANNEL_ID)
        .setSmallIcon(R.drawable.ic_notification)
        .setContentTitle("My Notification")
        .setContentText("This is a notification from my app")
        .setPriority(NotificationCompat.PRIORITY_DEFAULT);

    NotificationManager notificationManager = (NotificationManager)
getSystemService(Context.NOTIFICATION_SERVICE);
    notificationManager.notify(1, builder.build());
  }
}
```

Output:


9:40
program8
SEND NOTIFICATION


9:44
Fri, Feb 16
100%
Notifications
program8 • 2m
My Notification
This is a notification from my app
Silent
Android System
Serial console enabled
Performance is impacted. To disable, check bootloader.
Manage
Clear all

9. Create a Stopwatch application using android studio.

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:layout_gravity="center"
  android:gravity="center"
  android:orientation="vertical"
  tools:context=".MultiTaskActivity">
  <Button
    android:id="@+id/txtStopWatch"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="?actionBarSize"
    android:text="Stop Watch"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
</LinearLayout>
```

Activity_stopwatch.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:background="#0F9D58"
  android:layout_gravity="center"
  android:gravity="center"
  android:orientation="vertical"
  android:padding="16dp">
  <TextView
    android:id="@+id/time_view"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center_horizontal"
    android:textAppearance="@android:style/TextAppearance.Large"
    android:textSize="56sp" />
  <Button
    android:id="@+id/start_button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center_horizontal"
    android:layout_marginTop="20dp"
    android:onClick="onClickStart"
    android:text="Start" />
 <Button
    android:id="@+id/stop_button"
```

```
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_marginTop="8dp"
        android:onClick="onClickStop"
        android:text="Stop" />
    <Button
        android:id="@+id/reset_button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_marginTop="8dp"
        android:onClick="onClickReset"
        android:text="Reset" />
</LinearLayout>
```

StopWatchActivity.java:

```
package com.example.activity.myapplication;
import android.content.Intent;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import androidx.annotation.Nullable;
import androidx.appcompat.app.AppCompatActivity;
import java.util.Locale;
public class StopwatchActivity extends AppCompatActivity {
    private int seconds = 0;
    // Is the stopwatch running?
    private boolean running;
    private boolean wasRunning;
    @Override
    protected void onCreate(@Nullable Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_stopwatch);
        if (savedInstanceState != null) {
            // Get the previous state of the stopwatch
            // if the activity has been
            // destroyed and recreated.
            seconds = savedInstanceState.getInt("seconds");
            running = savedInstanceState.getBoolean("running");
            wasRunning = savedInstanceState.getBoolean("wasRunning");
        }
        runTimer();
    }
    private void runTimer() {

        final TextView timeView = (TextView) findViewById(R.id.time_view);
        Handler handler = new Handler();
```

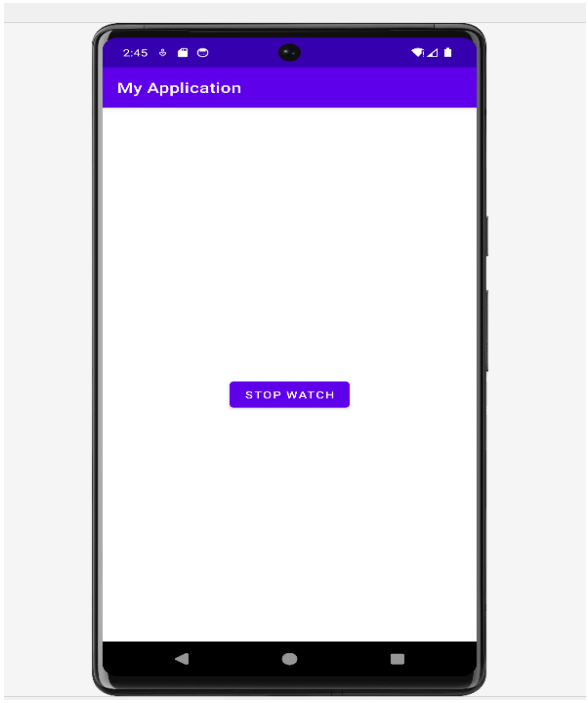
```
    handler.post(new Runnable() {
        @Override
        public void run() {
            int hours = seconds / 3600; //3600=1 hr
            int minutes = (seconds % 3600) / 60;
            int secs = seconds % 60;
            String time = String.format(Locale.getDefault(), "%d:%02d:%02d", hours,
                    minutes, secs);
            timeView.setText(time);
            if (running) {
                seconds++;
            }
            // Post the code again
            // with a delay of 1 second.
            handler.postDelayed(this, 1000);
        }
    });
}
@Override
public void onSaveInstanceState(Bundle savedInstanceState) {
    super.onSaveInstanceState(savedInstanceState);
    savedInstanceState.putInt("seconds", seconds);
    savedInstanceState.putBoolean("running", running);
    savedInstanceState.putBoolean("wasRunning", wasRunning);
}
@Override
protected void onPause() {
    super.onPause();
    wasRunning = running;
    running = false;
}
// If the activity is resumed,
// start the stopwatch
// again if it was running previously.
@Override
protected void onResume() {
    super.onResume();
    if (wasRunning) {
        running = true;
    }
}
// Start the stopwatch running
// when the Start button is clicked.
// Below method gets called
// when the Start button is clicked.
public void onClickStart(View view) {
    running = true;
}
// Stop the stopwatch running
```

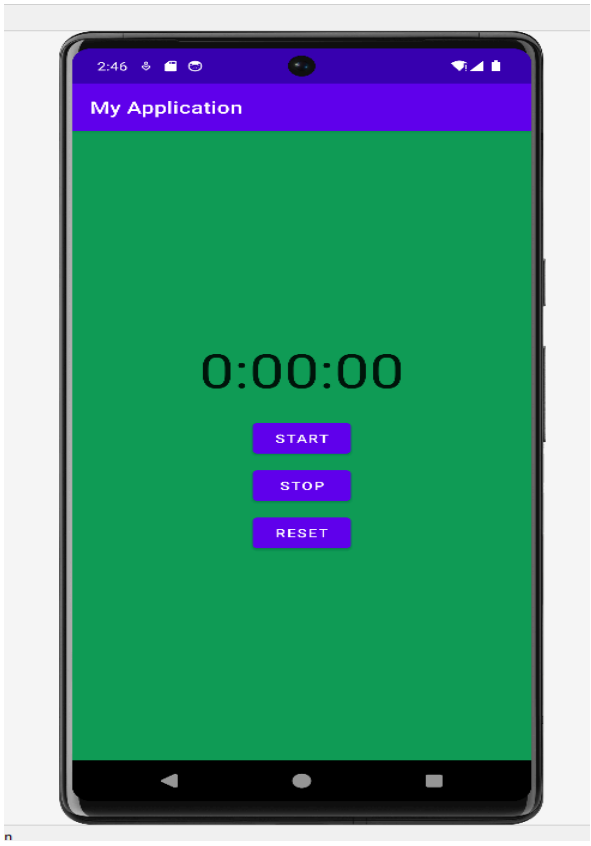
```
  // when the Stop button is clicked.
  // Below method gets called
  // when the Stop button is clicked.
  public void onClickStop(View view) {
     running = false;
  }
  // Reset the stopwatch when
  // the Reset button is clicked.
  // Below method gets called
  // when the Reset button is clicked.
  public void onClickReset(View view) {
     running = false;
     seconds = 0;
  }
}
```

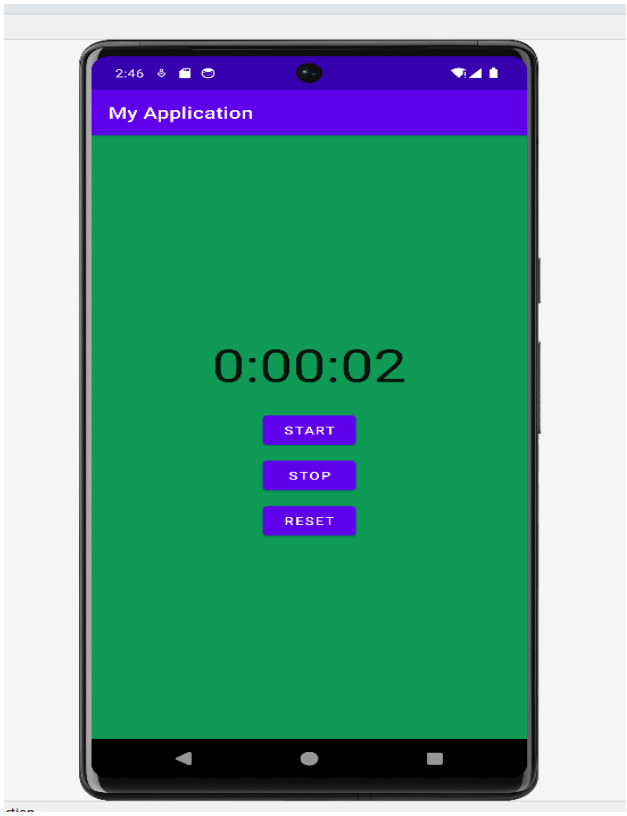
MainActivity.java:

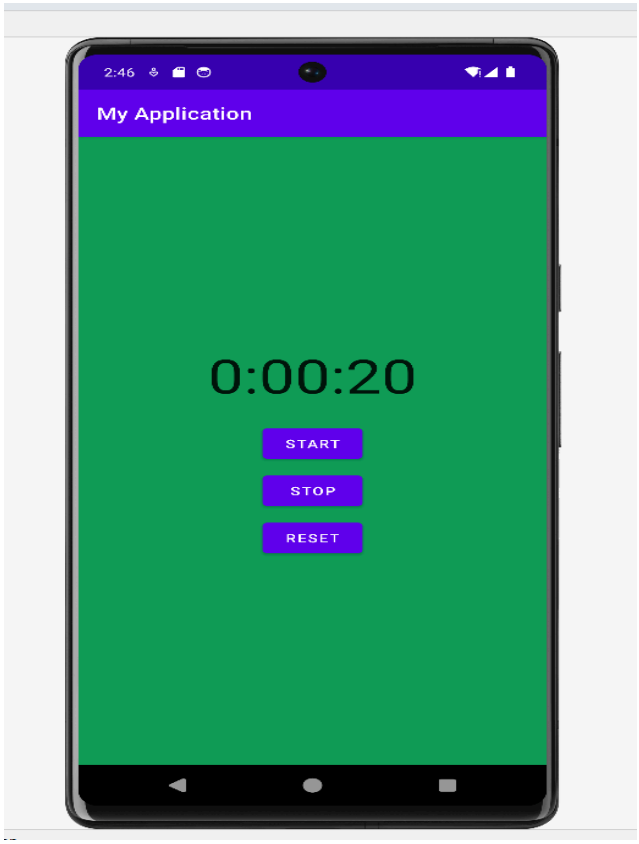
```
package com.example.activity.myapplication;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
public class MainActivity extends AppCompatActivity {
  private Button btn;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     findViewById(R.id.txtStopWatch).setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
           startActivity(new Intent(getApplicationContext(),StopwatchActivity.class));
        }
  });

}}
```

Output:


2:45
My Application
STOP WATCH


2:46
My Application
0:00:00
START
STOP
RESET


2:46
My Application
0:00:02
START
STOP
RESET


2:46
My Application
0:00:20
START
STOP
RESET

10. Exercise using Action bar, menus and adding menu items.

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">
  <androidx.appcompat.widget.Toolbar
    android:id="@+id/toolbar"
    android:layout_width="match_parent"
    android:layout_height="?attr/actionBarSize"
    android:background="?attr/colorPrimary"/>
  <androidx.constraintlayout.widget.ConstraintLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <TextView
      android:id="@+id/textView2"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_marginBottom="348dp"
      android:foregroundTint="#E33C3C"
      android:text="ACTION BAR AND MENU ITEMS"
      android:textColor="#14ACF1"
      android:textSize="24sp"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintHorizontal_bias="0.492"
      app:layout_constraintStart_toStartOf="parent" />
  </androidx.constraintlayout.widget.ConstraintLayout>
</RelativeLayout>
```

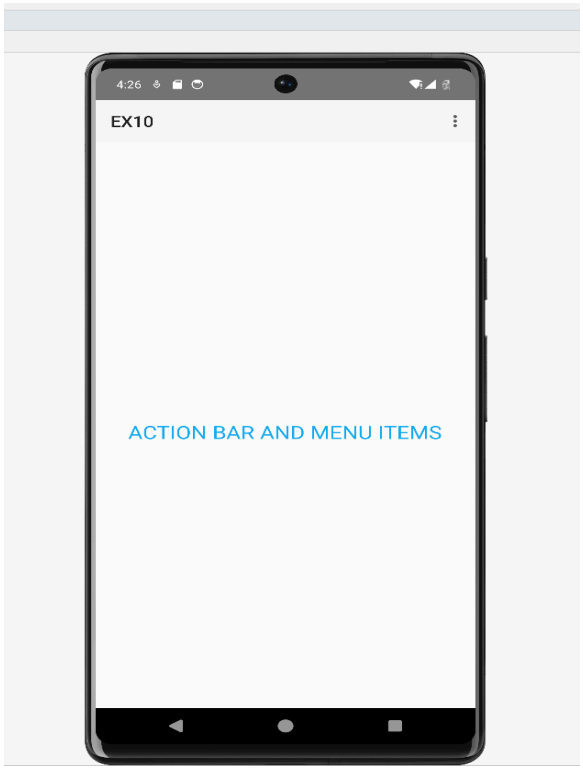
main_menu.xml:

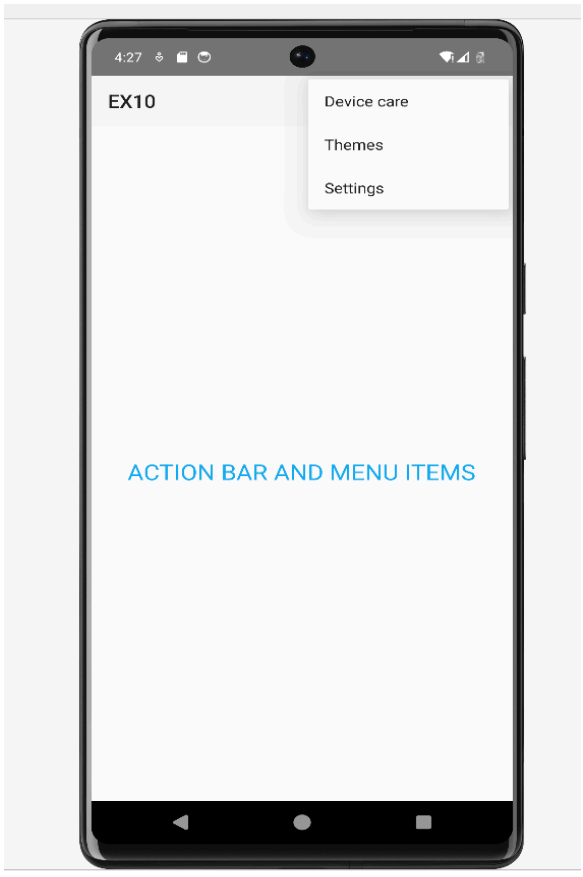
```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto">
  <item
    android:id="@+id/action_devicecare"
    android:title="Device care"
    app:showAsAction="never"/>
  <item
    android:id="@+id/action_themes"
    android:title="Themes"
    app:showAsAction="never"/>
  <item
    android:id="@+id/action_settings"
    android:title="Settings"
    app:showAsAction="never"/>
</menu>
```

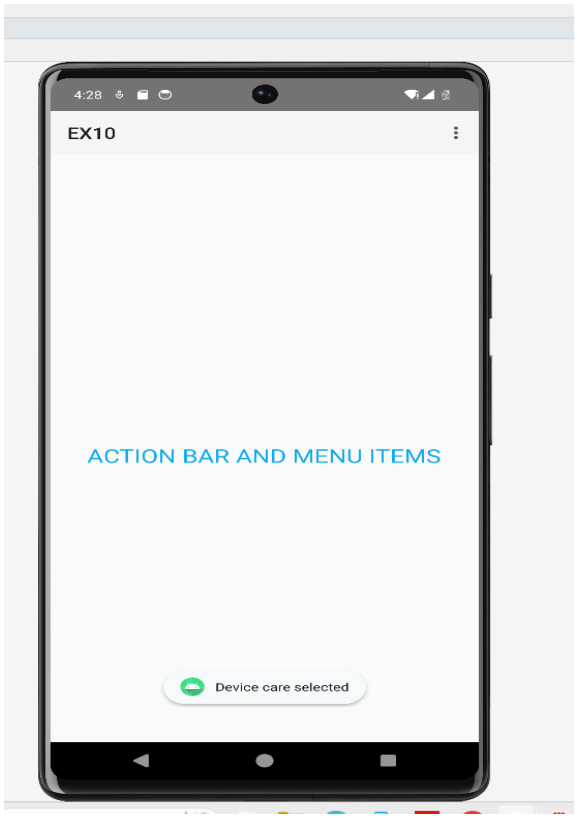
MainActivity.java:

```
package com.example.activity.ex10;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
import androidx.appcompat.widget.Toolbar;
public class MainActivity extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);

     Toolbar toolbar = findViewById(R.id.toolbar);
     setSupportActionBar(toolbar);
  }
  @Override
  public boolean onCreateOptionsMenu(Menu menu) {
     MenuInflater inflater = getMenuInflater();
     inflater.inflate(R.menu.main_menu, menu);
     return true;
  }
  @Override
  public boolean onOptionsItemSelected(MenuItem item) {
     // Handle item selection
     switch (item.getItemId()) {
        case R.id.action_devicecare:
           showToast("Device care selected");
           return true;
        case R.id.action_themes:
           showToast("Themes selected");
           return true;
        case R.id.action_settings:
           showToast("Settings selected");
           return true;
        default:
           return super.onOptionsItemSelected(item);
     }
  }
  private void showToast(String message) {
     Toast.makeText(this, message, Toast.LENGTH_SHORT).show();
  }
}
```

Output:


4:26
EX10
ACTION BAR AND MENU ITEMS


4:27
EX10
Device care
Themes
Settings
ACTION BAR AND MENU ITEMS


4:28
EX10
ACTION BAR AND MENU ITEMS
Device care selected

11.Exercise using saving and loading user preferences.

Activity_main.xml:

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:padding="16dp"
  tools:context=".MainActivity">
  <TextView
    android:id="@+id/tv_language"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Preferred Language:"
    android:textSize="18sp"
    android:layout_marginTop="16dp" />
  <Spinner
    android:id="@+id/spinner_language"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@id/tv_language"
    android:layout_marginTop="8dp" />
  <TextView
    android:id="@+id/tv_font_size"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Preferred Font Size:"
    android:textSize="18sp"
    android:layout_below="@id/spinner_language"
    android:layout_marginTop="16dp" />
  <SeekBar
    android:id="@+id/seekBar_font_size"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@id/tv_font_size"
    android:layout_marginTop="8dp"
    android:max="30"
    android:progress="18" />
  <Button
    android:id="@+id/btn_save"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Save Preferences"
    android:layout_below="@id/seekBar_font_size"
    android:layout_centerHorizontal="true"
    android:layout_marginTop="24dp" />

</RelativeLayout>
```

arrays.xml:

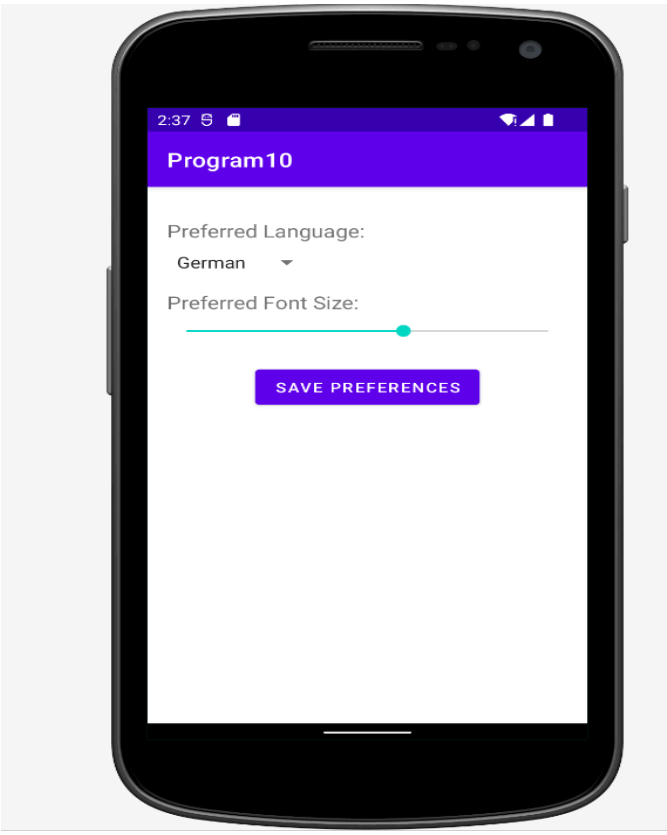
```
<resources>
  <string-array name="languages_array">
     <item>English</item>
     <item>Spanish</item>
     <item>French</item>
     <item>German</item>
     <item>Chinese</item>
  </string-array>
</resources>
```

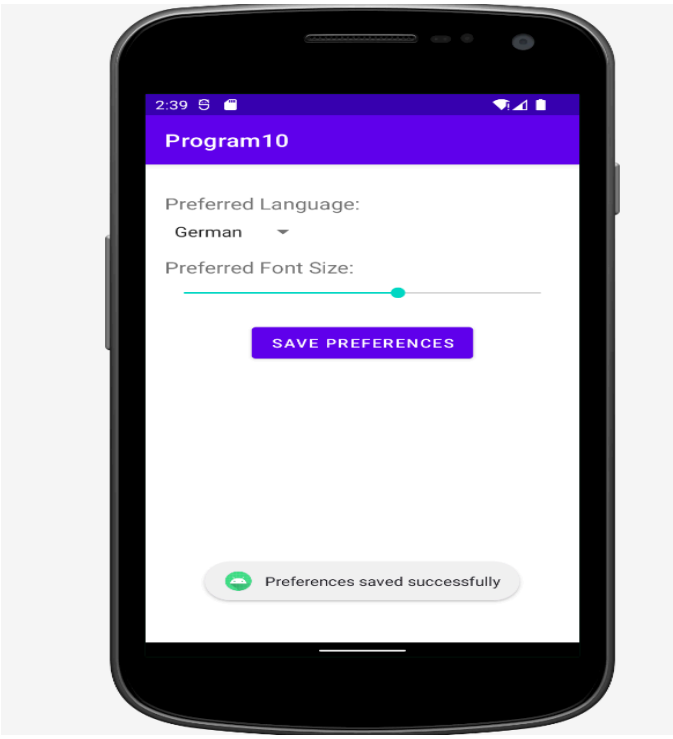
MainActivity.java:

```
package com.example.activity.program10;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.SeekBar;
import android.widget.Spinner;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
  private Spinner spinnerLanguage;
  private SeekBar seekBarFontSize;
  private Button btnSave;
  private SharedPreferences preferences;
  private static final String PREF_NAME = "user_preferences";
  private static final String KEY_LANGUAGE = "preferred_language";
  private static final String KEY_FONT_SIZE = "preferred_font_size";
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     spinnerLanguage = findViewById(R.id.spinner_language);
     seekBarFontSize = findViewById(R.id.seekBar_font_size);
     btnSave = findViewById(R.id.btn_save);
     // Set up spinner with language options
     ArrayAdapter<CharSequence> adapter = ArrayAdapter.createFromResource(this,
          R.array.languages_array, android.R.layout.simple_spinner_item);
     adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
     spinnerLanguage.setAdapter(adapter);
     preferences = getSharedPreferences(PREF_NAME, MODE_PRIVATE);
     // Load preferences
     loadPreferences();
     btnSave.setOnClickListener(v -> savePreferences());
  }
  private void loadPreferences() {
     String language = preferences.getString(KEY_LANGUAGE, "");
     int fontSize = preferences.getInt(KEY_FONT_SIZE, 18);
```

```
        // Set saved preferences
        spinnerLanguage.setSelection(getIndex(spinnerLanguage, language));
        seekBarFontSize.setProgress(fontSize);
    }
    private void savePreferences() {
        String selectedLanguage = spinnerLanguage.getSelectedItem().toString();
        int selectedFontSize = seekBarFontSize.getProgress();
        // Save preferences
        SharedPreferences.Editor editor = preferences.edit();
        editor.putString(KEY_LANGUAGE, selectedLanguage);
        editor.putInt(KEY_FONT_SIZE, selectedFontSize);
        editor.apply();
        Toast.makeText(this, "Preferences saved successfully", Toast.LENGTH_SHORT).show();
    }
    private int getIndex(Spinner spinner, String value) {
        for (int i = 0; i < spinner.getCount(); i++) {
            if (spinner.getItemAtPosition(i).toString().equalsIgnoreCase(value)) {
                return i;
            }
        }
        return 0;
    }
}
```

Output:


2:37
Program10
Preferred Language:
German
Preferred Font Size:
SAVE PREFERENCES


2:39
Program10
Preferred Language:
German
Preferred Font Size:
SAVE PREFERENCES
Preferences saved successfully

13. Perform CURD (create, update, read, delete) operations

Activity_main.xml:

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:padding="16dp">
 <EditText
      android:id="@+id/editTextPhoneNumber"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_marginBottom="8dp"
      android:hint="Phone Number"
      tools:ignore="TouchTargetSizeCheck" />
  <EditText
      android:id="@+id/editTextMessage"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_below="@id/editTextPhoneNumber"
      android:layout_marginBottom="8dp"
      android:hint="Message"
      tools:ignore="TouchTargetSizeCheck" />
  <Button
      android:id="@+id/buttonSend"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_below="@id/editTextMessage"
      android:layout_alignParentEnd="true"
      android:text="Send" />
 <TextView
      android:id="@+id/textViewReceivedMessage"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_below="@id/buttonSend"
      android:layout_marginTop="16dp"
      android:text="Received Message:"
      android:textStyle="bold" />
</RelativeLayout>
```

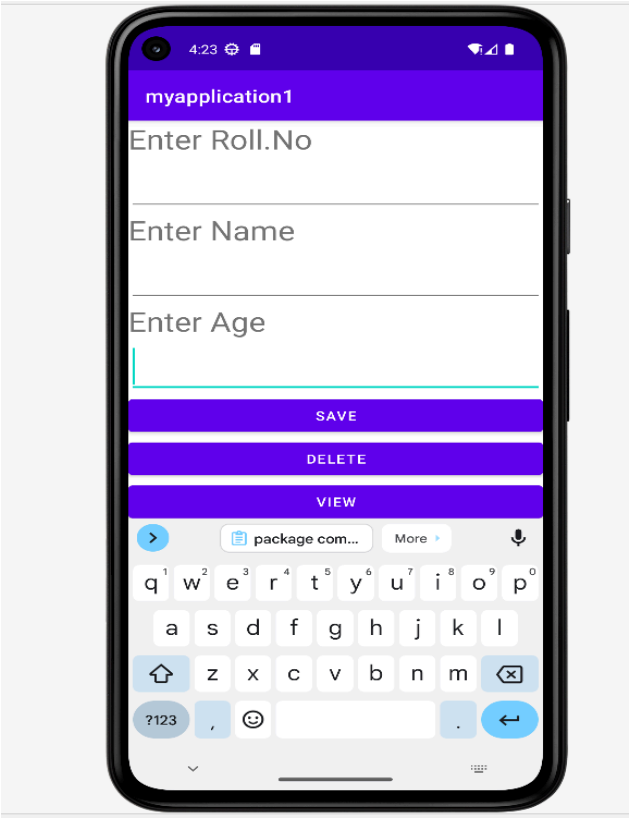
MainActivity.java:

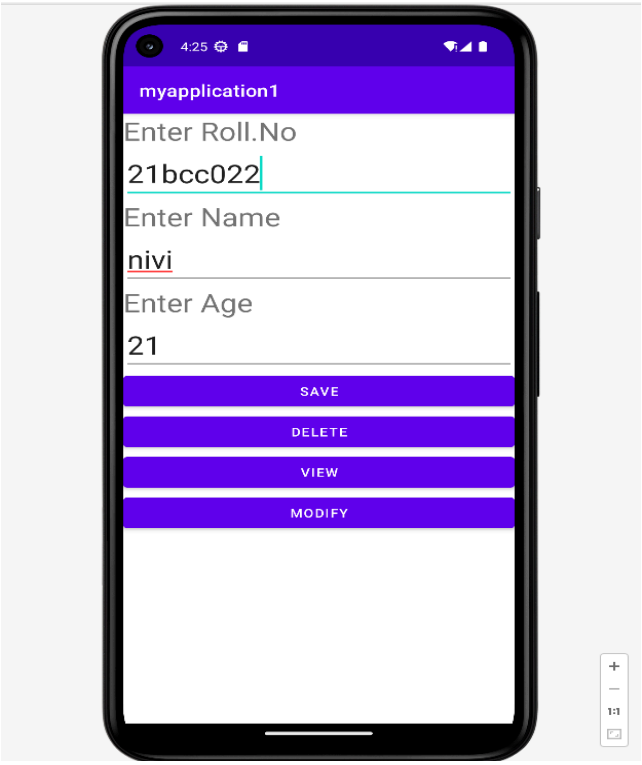
```
package com.example.myapplication1;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
```

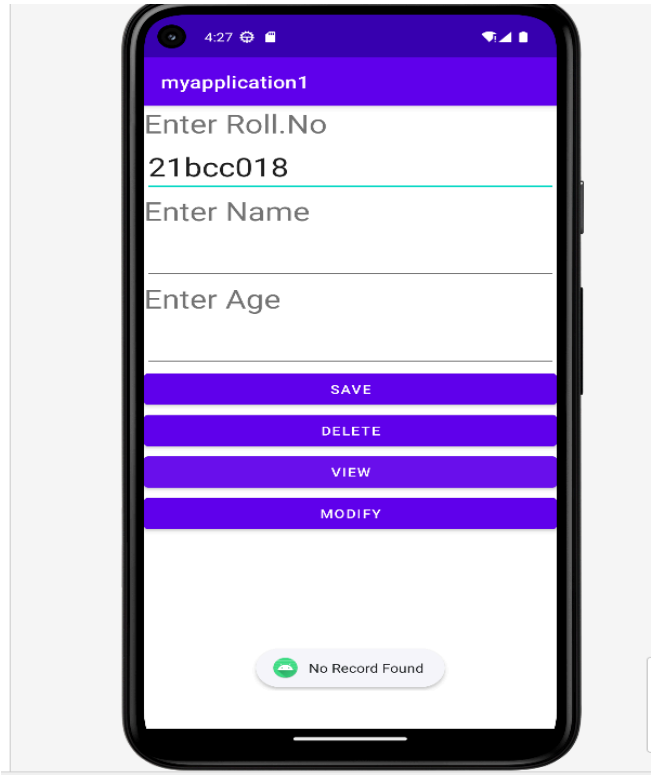
```
public class MainActivity extends AppCompatActivity {
  SQLiteDatabase db;
  Button btnsave,btnDelete,btnModify,btnView,btnViewAll;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     btnsave=(Button)findViewById(R.id.btnsave);
     btnDelete=(Button) findViewById(R.id.btnDelete) ;
     btnModify=(Button) findViewById(R.id.btnModify) ;
     btnView=(Button) findViewById(R.id.btnView) ;
     EditText edttxtrollno = (EditText) findViewById(R.id.edttxtrollno);
     EditText edttxtname = (EditText) findViewById(R.id.edttxtname);
     EditText edttxtage = (EditText) findViewById(R.id.edttxtage);
     db=openOrCreateDatabase("StudentDB", Context.MODE_PRIVATE,null);
     btnsave.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
           //Toast.makeText(getApplicationContext(),"Database Created",Toast.LENGTH_LONG).show();
           db.execSQL("CREATE TABLE IF NOT EXISTS Studentnew(Rollno VARCHAR, Name VARCHAR,Age
VARCHAR);");
           //db.execSQL("INSERT INTO Student1 VALUES( '"+edttxtname.getText()+"','"+
edttxtage.getText()+"');");     db.execSQL("INSERT INTO Studentnew VALUES( '" + edttxtrollno.getText()+"',
'"+edttxtname.getText()+"','"+ edttxtage.getText()+"');");
           showToast("Record Inserted");
           edttxtrollno.setText("");
           edttxtname.setText("");
           edttxtage.setText("");
        }});
btnDelete.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
db.execSQL("Delete from Studentnew where Rollno='"+ edttxtrollno.getText()+"'");
           showToast("Record Deleted");
           edttxtrollno.setText("");
           edttxtname.setText("");
           edttxtage.setText("");
        }
     });
     btnView.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
           if(edttxtrollno.getText().toString().trim().length()==0){
              showToast("Please enter Rollno"); }
           Cursor c=db.rawQuery("SELECT * FROM Studentnew WHERE Rollno='"+edttxtrollno.getText()+"'",
null);
           if(c.moveToFirst())
           { if(c.getCount()==0)
              {
```

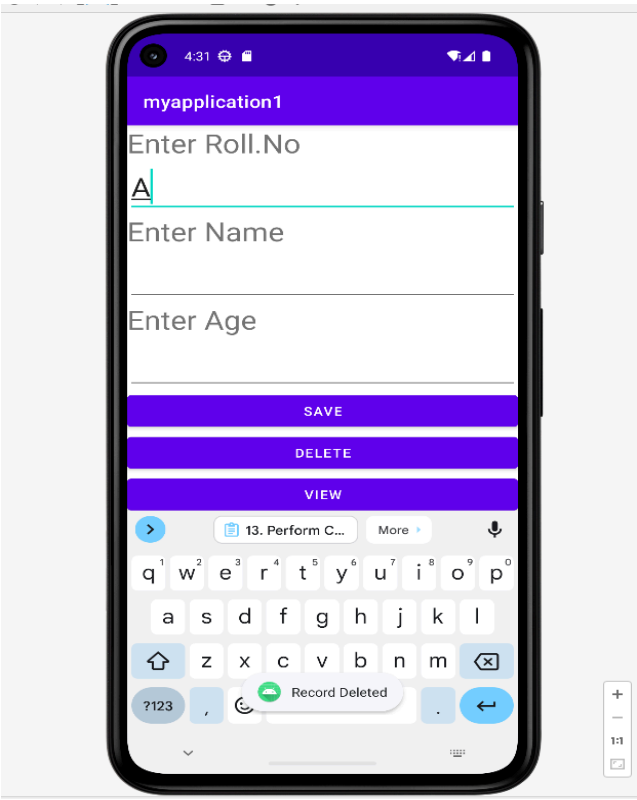
```
                showToast("No Record Found");
            } else{
                edttxtname.setText(c.getString(1));
                edttxtage.setText(c.getString(2));
            }  } else {
            showToast("No Record Found ");
                    } }
    });
 btnModify.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {

            if(edttxtrollno.getText().toString().trim().length()==0)
            {
                showToast("Please enter Rollno");
            }
            Cursor c=db.rawQuery("SELECT * FROM Studentnew WHERE Rollno='"+edttxtrollno.getText()+"'",
null);
            if(c.moveToFirst(){
                db.execSQL("UPDATE Studentnew SET
Name='"+edttxtname.getText()+"',Age='"+edttxtage.getText()+
                        "' WHERE Rollno='"+edttxtrollno.getText()+"'");
                showToast("Record Updated");
                edttxtrollno.setText("");
                edttxtname.setText("");
                edttxtage.setText("");
            }}
    });}
  private void showToast(String message) {
    Toast.makeText(this, message, Toast.LENGTH_SHORT).show();
  }}
```

Output:


4:23
myapplication1
Enter Roll.No
Enter Name
Enter Age
SAVE
DELETE
VIEW
package com...
More


4:25
myapplication1
Enter Roll.No
21bcc022
Enter Name
nivi
Enter Age
21
SAVE
DELETE
VIEW
MODIFY


4:27
myapplication1
Enter Roll.No
21bcc018
Enter Name
Enter Age
SAVE
DELETE
VIEW
MODIFY
No Record Found


4:31
myapplication1
Enter Roll.No
A
Enter Name
Enter Age
SAVE
DELETE
VIEW
13. Perform C...
More
Record Deleted