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| MOBILE APPLICATIONS DEVELOPMENT LAB  CSLR-34 |

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| 25/03/2021 | Experiment- 6 |

Submitted By: -

**Supria Basak**

**106118116**

**CSE**

QUESTION-1: DESIGN AN ANDROID APPLICATION USING ANDROID STUDIO WITH THE FOLLOWING

i) In an activity, have a menu with a list of menu items such as My app, Control, Settings, Exit. Upon clicking on the menu items, do the following.  
My app - Open the fragments program application done in previous labs  
Selfie - Open camera application  
Exit - exit the application  
Control - Have options for the following:  
Switch on/off mobile data  
Enable/Disable the status bar  
Change the ringtone using preferences  
Enable/disable battery percentage of the mobile  
Enable/Disable dark theme.  
ii) Have text views and textboxes to get name, email id, mobile number from user and store it in sharedpreferences upon clicking a button. Have one more button, upon clicking, retrieve the information entered and display it on the screen

**EXPERIMENT NAME**: To design an app with the given options in the menu bar and text views to read data from the user.

**AIM:** To design an app with the given options in the menu bar and text views to read data from the user.

**DESCRIPTION OF APP:**

In an activity, have a menu with a list of menu items such as My app, Control, Settings, Exit. Upon clicking on the menu items, do the following.  
My app - Open the fragments program application done in previous labs  
Selfie - Open camera application  
Exit - exit the application  
Control - Have options for the following:  
Switch on/off mobile data  
Enable/Disable the status bar  
Change the ringtone using preferences  
Enable/disable battery percentage of the mobile  
Enable/Disable dark theme.  
ii) Have text views and textboxes to get name, email id, mobile number from user and store it in sharedpreferences upon clicking a button. Have one more button, upon clicking, retrieve the information entered and display it on the screen

**DEVICE SPECIFICATION:**

**Device Name: -** Samsung S10  
**Android Version: - Android 11**  
**API Level: -** 30  
**Screen Size: -** 6 inch

**TECHNICAL CONCEPTS LEARNT:**

#### How to create menus.

#### How to change system settings directly using the app.

#### Storing and retrieving data.

#### Creating and using preferences.

#### How to handle many different errors related to Menus and interaction.

#### How to enable or disable status bar.

**SOURCE CODE:**

MainActivity.java  
  
**package** com.example.lab6;  
  
**import** androidx.annotation.NonNull;  
**import** androidx.appcompat.app.AppCompatActivity;  
  
**import** android.content.Intent;  
**import** android.content.SharedPreferences;  
**import** android.os.Bundle;  
**import** android.provider.MediaStore;  
**import** android.view.Menu;  
**import** android.view.MenuItem;  
**import** android.view.View;  
**import** android.widget.Button;  
**import** android.widget.EditText;  
**import** android.widget.TextView;  
**import** android.widget.Toast;  
  
**public class** MainActivity<on> **extends** AppCompatActivity **implements** View.OnClickListener {  
  
 **private static final int *REQUEST\_IMAGE\_CAPTURE*** = 101;  
 Button **store**,**retrieve**;  
 EditText **name**,**email**,**number**;  
 TextView **details**;  
 **private int MODE\_PUBLIC**;  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_main***);  
 **store**=findViewById(R.id.***button***);  
 **retrieve**=findViewById(R.id.***button2***);  
 **name**=findViewById(R.id.***person\_name***);  
 **email**=findViewById(R.id.***person\_email***);  
 **number**=findViewById(R.id.***person\_phone***);  
 **details**=findViewById(R.id.***details***);  
 **store**.setOnClickListener(**this**::onClick);  
 **retrieve**.setOnClickListener(**this**::onClick);  
 }  
  
 @Override  
 **public boolean** onCreateOptionsMenu(Menu menu) {  
 getMenuInflater().inflate(R.menu.***mymenu***,menu);  
 **return super**.onCreateOptionsMenu(menu);  
 }  
  
 @Override  
 **public boolean** onOptionsItemSelected(@NonNull MenuItem item) {  
 Intent intent;  
 **switch** (item.getItemId()){  
 **case** R.id.***myapp\_intent***:  
 intent=getPackageManager().getLaunchIntentForPackage(**"com.example.departmentRegistration"**);  
 startActivity(intent);  
 **break**;  
 **case** R.id.***cam\_intent***:  
 intent = **new** Intent(MediaStore.***INTENT\_ACTION\_STILL\_IMAGE\_CAMERA***);  
 startActivityForResult(intent, ***REQUEST\_IMAGE\_CAPTURE***);  
 **break**;  
 **case** R.id.***options\_prefs***:  
 intent=**new** Intent(MainActivity.**this**,ControlsActivity.**class**);  
 startActivity(intent);  
 **break**;  
 **case** R.id.***exit***:  
 MainActivity.**this**.finish();  
 System.*exit*(0);  
 **break**;  
 **default**:  
 **throw new** IllegalStateException(**"Unexpected value: "** + item.getItemId());  
 }  
 **return super**.onOptionsItemSelected(item);  
 }  
  
 @Override  
 **public void** onClick(View view) {  
 SharedPreferences sp= getSharedPreferences(**"MyPrefs"**, **MODE\_PUBLIC**);  
 SharedPreferences.Editor editor=sp.edit();  
 **switch** (view.getId()){  
 **case** R.id.***button***:  
 editor.putString(**"Name"**,**name**.getText().toString());  
 editor.putString(**"Email"**,**email**.getText().toString());  
 editor.putString(**"Number"**,**number**.getText().toString());  
 editor.commit();  
 **break**;  
 **case** R.id.***button2***:  
 String finals=sp.getString(**"Name"**,**""**)+**"\n"**+sp.getString(**"Email"**,**""**)+**"\n"**+sp.getString(**"Number"**,**""**);  
 Toast.*makeText*(**this**, finals,Toast.***LENGTH\_LONG***).show();  
 **break**;  
 }  
 }  
}

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"  
 android:orientation="vertical"  
 android:background="#0BF4B2"**>  
  
 <**EditText  
 android:id="@+id/person\_name"  
 android:layout\_width="306dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_above="@+id/person\_email"  
 android:layout\_alignParentLeft="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_marginLeft="46dp"  
 android:layout\_marginRight="59dp"  
 android:layout\_marginBottom="27dp"  
 android:autofillHints=""  
 android:ems="10"  
 android:hint="@string/name"  
 android:inputType="textPersonName"** />  
  
 <**EditText  
 android:id="@+id/person\_email"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_above="@+id/person\_phone"  
 android:layout\_alignParentLeft="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_marginLeft="41dp"  
 android:layout\_marginRight="41dp"  
 android:layout\_marginBottom="29dp"  
 android:autofillHints=""  
 android:ems="10"  
 android:hint="@string/email"  
 android:inputType="textEmailAddress"** />  
  
 <**EditText  
 android:id="@+id/person\_phone"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_above="@+id/button"  
 android:layout\_alignParentLeft="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_marginLeft="31dp"  
 android:layout\_marginRight="28dp"  
 android:layout\_marginBottom="34dp"  
 android:autofillHints=""  
 android:ems="10"  
 android:hint="@string/phone"  
 android:inputType="phone"** />  
  
 <**Button  
 android:id="@+id/button"  
 android:layout\_width="121dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_above="@+id/button2"  
 android:layout\_alignParentLeft="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_gravity="center\_horizontal"  
 android:layout\_marginLeft="140dp"  
 android:layout\_marginRight="150dp"  
 android:layout\_marginBottom="12dp"  
 android:text="@string/store"** />  
  
 <**Button  
 android:id="@+id/button2"  
 android:layout\_width="135dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentLeft="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_gravity="center\_horizontal"  
 android:layout\_marginLeft="136dp"  
 android:layout\_marginRight="140dp"  
 android:layout\_marginBottom="254dp"  
 android:text="@string/retrieve"** />  
</**RelativeLayout**>

ControlsActivity.java

**package** com.example.lab6;  
  
**import** android.app.ActionBar;  
**import** android.content.ContentResolver;  
**import** android.content.Intent;  
**import** android.content.SharedPreferences;  
**import** android.graphics.Color;  
**import** android.media.Ringtone;  
**import** android.media.RingtoneManager;  
**import** android.net.Uri;  
**import** android.os.Build;  
**import** android.os.Bundle;  
**import** android.preference.ListPreference;  
**import** android.preference.Preference;  
**import** android.preference.PreferenceActivity;  
**import** android.preference.PreferenceManager;  
**import** android.preference.RingtonePreference;  
**import** android.preference.SwitchPreference;  
**import** android.provider.Settings;  
**import** android.util.Log;  
**import** android.view.Window;  
**import** android.view.WindowManager;  
  
**import** androidx.annotation.Nullable;  
**import** androidx.annotation.RequiresApi;  
**import** androidx.appcompat.app.AppCompatDelegate;  
  
**public class** ControlsActivity **extends** PreferenceActivity **implements** Preference.OnPreferenceChangeListener {  
 ActionBar **actionBar**;  
 **private int brightness**;  
 **private** ContentResolver **cResolver**;  
 **private** Window **window**;  
 @RequiresApi(api = Build.VERSION\_CODES.***M***)  
 @SuppressWarnings(**"deprecation"**)  
 @Override  
 **protected void** onCreate(@Nullable Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 **actionBar**=getActionBar();  
 checkSystemWritePermission();  
 addPreferencesFromResource(R.xml.***prefs***);  
 **cResolver** = getContentResolver();  
 **window** = getWindow();  
 **try** {  
 Settings.System.*putInt*(**cResolver**,  
 Settings.System.***SCREEN\_BRIGHTNESS\_MODE***, Settings.System.***SCREEN\_BRIGHTNESS\_MODE\_MANUAL***);  
 **brightness** = Settings.System.*getInt*(**cResolver**, Settings.System.***SCREEN\_BRIGHTNESS***);  
 }  
 **catch** (Settings.SettingNotFoundException e) {  
 Log.*e*(**"Error"**, **"Cannot access system brightness"**);  
 e.printStackTrace();  
 }  
 settings();  
 }  
  
 **private void** settings(){  
 SharedPreferences sp=PreferenceManager.*getDefaultSharedPreferences*(**this**);  
  
 SwitchPreference dataPref= (SwitchPreference) findPreference(**"data\_pref"**);  
 **boolean** dataOn=sp.getBoolean(**"data\_pref"**,**true**);  
 **if** (dataOn)  
 enableStatusBar();  
 **else** disableStatusBar();  
 dataPref.setOnPreferenceChangeListener(**new** Preference.OnPreferenceChangeListener() {  
 @Override  
 **public boolean** onPreferenceChange(Preference preference, Object o) {  
 **boolean** yes=(**boolean**)o;  
 **if** (yes)  
 enableStatusBar();  
 **else** disableStatusBar();  
 **return true**;  
 }  
 });  
  
 ListPreference LP= (ListPreference) findPreference(**"brightness\_pref"**);  
 String bright=sp.getString(**"brightness\_pref"**,**"254"**);  
 **if** (**"1"**.equals(bright)){  
 **brightness**=1;  
 setBrightness();  
 LP.setSummary(LP.getEntry());  
 }**else if** (**"127.5"**.equals(bright)){  
 **brightness**=10;  
 setBrightness();  
 LP.setSummary(LP.getEntry());  
 }**else if** (**"254"**.equals(bright)){  
 **brightness**=50;  
 setBrightness();  
 LP.setSummary(LP.getEntry());  
 }  
 LP.setOnPreferenceChangeListener(**new** Preference.OnPreferenceChangeListener() {  
 @Override  
 **public boolean** onPreferenceChange(Preference preference, Object o) {  
 String items=(String)o;  
 **if** (preference.getKey().equals(**"brightness\_pref"**)){  
 **switch** (items){  
 **case "1"**:  
 **brightness**=1;  
 **break**;  
 **case "127.5"**:  
 **brightness**=10;  
 **break**;  
 **case "254"**:  
 **brightness**=50;  
 **break**;  
 }  
 setBrightness();  
 ListPreference LPP=(ListPreference)preference;  
 LPP.setSummary(LPP.getEntries()[LPP.findIndexOfValue(items)]);  
 }  
 **return true**;  
 }  
 });  
  
 RingtonePreference ringtonePreference= (RingtonePreference) findPreference(**"ringtone\_pref"**);  
 Ringtone ringtone = RingtoneManager.*getRingtone*(**this**, Uri.*parse*(sp.getString(**"ringtone\_pref"**,**""**)));  
 **if** (ringtone != **null**)  
 ringtonePreference.setSummary(ringtone.getTitle(**this**));  
 **else** ringtonePreference.setSummary(**"Silent"**);  
 ringtonePreference.setOnPreferenceChangeListener(**this**::onPreferenceChange);  
  
 SwitchPreference ntMode= (SwitchPreference) findPreference(**"darkmode\_pref"**);  
 **boolean** dark=sp.getBoolean(**"darkmode\_pref"**,**false**);  
 **if** (dark)  
 darkMode();  
 **else** lightMode();  
 ntMode.setOnPreferenceChangeListener(**new** Preference.OnPreferenceChangeListener() {  
 @Override  
 **public boolean** onPreferenceChange(Preference preference, Object o) {  
 **boolean** yes=(**boolean**)o;  
 **if** (yes)  
 darkMode();  
 **else** lightMode();  
 **return true**;  
 }  
 });  
 }  
 **private void** enableStatusBar(){  
 getWindow().addFlags(WindowManager.LayoutParams.***FLAG\_FULLSCREEN***);  
 }  
 **private void** disableStatusBar(){  
 getWindow().clearFlags(WindowManager.LayoutParams.***FLAG\_FULLSCREEN***);  
 }  
 **private void** darkMode(){  
 getListView().setBackgroundColor(Color.*parseColor*(**"#444444"**));  
 }  
 **private void** lightMode(){  
 getListView().setBackgroundColor(Color.*parseColor*(**"#FFFFFF"**));  
 }  
 **private void** setBrightness(){  
 Settings.System.*putInt*(**cResolver**, Settings.System.***SCREEN\_BRIGHTNESS***, **brightness**);  
 WindowManager.LayoutParams layoutpars = **window**.getAttributes();  
 layoutpars.**screenBrightness** = **brightness** / (**float**)255;  
 **window**.setAttributes(layoutpars);  
 }  
 **private boolean** checkSystemWritePermission() {  
 **if** (Build.VERSION.***SDK\_INT*** >= Build.VERSION\_CODES.***M***) {  
 **if**(Settings.System.*canWrite*(**this**.getApplicationContext()))  
 **return true**;  
 **else** openAndroidPermissionsMenu();  
 }  
 **return false**;  
 }  
  
 **private void** openAndroidPermissionsMenu() {  
 **if** (Build.VERSION.***SDK\_INT*** >= Build.VERSION\_CODES.***M***) {  
 Intent intent = **new** Intent(Settings.***ACTION\_MANAGE\_WRITE\_SETTINGS***);  
 intent.setData(Uri.*parse*(**"package:"** + **this**.getApplicationContext().getPackageName()));  
 **this**.getApplicationContext().startActivity(intent);  
 }  
 }  
  
 */\*\*  
 \** ***@param preference*** *\** ***@param o*** *\** ***@deprecated*** *\*/* @Override  
 **public boolean** onPreferenceChange(Preference preference, Object o) {  
 **if** (preference.getKey().equals(**"ringtone\_pref"**)) {  
 updateRingtoneSummary((RingtonePreference) preference, Uri.*parse*((String) o));  
 }  
 **return true**;  
 }  
 **private void** updateRingtoneSummary(RingtonePreference preference, Uri ringtoneuri) {  
 Ringtone ringtone = RingtoneManager.*getRingtone*(**this**, ringtoneuri);  
 **if** (ringtone != **null**)  
 preference.setSummary(ringtone.getTitle(**this**));  
 **else** preference.setSummary(**"Silent"**);  
 }  
}

xml/prefs.xml

*<?***xml version="1.0" encoding="utf-8"***?>*<**PreferenceScreen xmlns:android="http://schemas.android.com/apk/res/android"**>  
  
 <**PreferenceCategory android:title="Status Bar"**>  
  
 <**SwitchPreference  
 android:defaultValue="true"  
 android:key="data\_pref"  
 android:summaryOff="Status Bar is hidden"  
 android:summaryOn="Status Bar is visible"  
 android:title="Status Bar"** />  
 </**PreferenceCategory**>  
 <**PreferenceCategory android:title="Brightness"**>  
 <**ListPreference  
 android:defaultValue="false"  
 android:entries="@array/item\_name"  
 android:entryValues="@array/item\_value"  
 android:key="brightness\_pref"  
 android:title="Brightness Level"** />  
 </**PreferenceCategory**>  
 <**PreferenceCategory android:title="Ringtone"**>  
 <**RingtonePreference  
 android:key="ringtone\_pref"  
 android:ringtoneType="ringtone"  
 android:title="Ringtone Sounds"** />  
 </**PreferenceCategory**>  
 <**PreferenceCategory android:title="Dark Theme"**>  
  
 <**SwitchPreference  
 android:defaultValue="false"  
 android:key="darkmode\_pref"  
 android:summaryOff="Dark mode disabled"  
 android:summaryOn="Dark mode enabled"  
 android:title="Dark Mode"** />  
 </**PreferenceCategory**>  
</**PreferenceScreen**>

menu/mymenu.xml

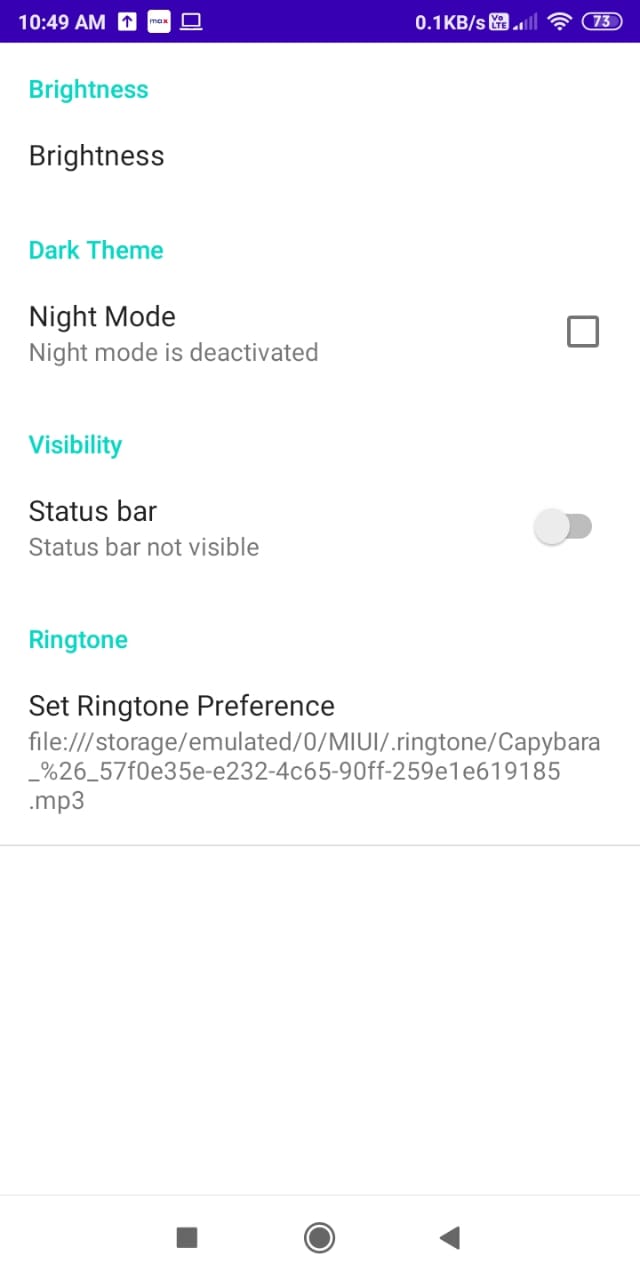
*<?***xml version="1.0" encoding="utf-8"***?>*<**menu xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:android="http://schemas.android.com/apk/res/android"**>  
  
 <**item  
 android:id="@+id/myapp\_intent"  
 android:title="My App"  
 app:showAsAction="ifRoom|collapseActionView"** />  
 <**item  
 android:id="@+id/cam\_intent"  
 android:title="Selfie"  
 app:showAsAction="ifRoom|collapseActionView"** />  
 <**item  
 android:id="@+id/options\_prefs"  
 android:title="Control"  
 app:showAsAction="ifRoom|collapseActionView"** />  
 <**item  
 android:id="@+id/exit"  
 android:title="Exit"  
 app:showAsAction="ifRoom|collapseActionView"** />  
</**menu**>

res/array.xml

*<?***xml version="1.0" encoding="utf-8"***?>*<**resources**>  
 <**string-array name="item\_name"**>  
 <**item**>Low</**item**>  
 <**item**>Medium</**item**>  
 <**item**>High</**item**>  
 </**string-array**>  
 <**string-array name="item\_value"**>  
 <**item**>1</**item**>  
 <**item**>127.5</**item**>  
 <**item**>254</**item**>  
 </**string-array**>  
</**resources**>

AndroidManifest.xml

*<?***xml version="1.0" encoding="utf-8"***?>*<**manifest xmlns:android="http://schemas.android.com/apk/res/android"  
 package="com.example.suppuapp"**>  
  
 <**application  
 android:allowBackup="true"  
 android:icon="@mipmap/ic\_launcher"  
 android:label="@string/app\_name"  
 android:roundIcon="@mipmap/ic\_launcher\_round"  
 android:supportsRtl="true"  
 android:theme="@style/AppTheme"**>  
 <**activity android:name=".MainActivity"**>  
 <**intent-filter**>  
 <**action android:name="android.intent.action.MAIN"** />  
  
 <**category android:name="android.intent.category.LAUNCHER"** />  
 </**intent-filter**>  
 </**activity**>  
 <**activity android:name=".ControlsActivity"** />  
 </**application**>  
  
</**manifest**>



**Outcome:**

* All specifications are successfully executed.
* An app with a menu and shared preferences was created