

Mobile Application Development Lab Record

1. Simple Hello World Program

- AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
package="com.android_lab.hello_world">

    <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>
    </application>

</manifest>
```

- activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
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">

    <TextView
        android:id="@+id/textview"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        android:textColor="@android:color/black"
        android:textSize="18sp"
        app:layout_constraintBottom_toBottomOf="parent"
```

```

        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>

```

- MainActivity.java

```

package com.android_lab.hello_world;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

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

        Toast.makeText(this, "Hello, World!",
        Toast.LENGTH_LONG).show();
    }
}

```

Question 2: Demonstrate setOnClickListener() method

- AndroidManifest.xml

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.android_lab.onclicklistener">

    <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>
    </application>

</manifest>
```

- android_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"
    tools:context=".MainActivity"
    android:orientation="vertical">

    <Button
        android:id="@+id/button"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Click Me" />

</LinearLayout>
```

- MainActivity.java

```
package com.android_lab.onclicklistener;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    private Button button;

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

        button = findViewById(R.id.button);
        button.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
```

```

        Toast.makeText(getApplicationContext(),
"OnClickListener(): Button Clicked!", Toast.LENGTH_LONG).show();
    }
    });
}
}

```

Question 3: Demonstrate the concept of passing data through intents

- AndroidManifest.xml

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
package="com.android_lab.intents">

    <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=".HomeActivity"></activity>
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category
android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>

```

- 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:orientation="vertical"
    tools:context=".MainActivity" >

    <TextView
        android:id="@+id/uname_label"

```

```

        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Username"
        android:textColor="@android:color/black" />

<EditText
    android:id="@+id/uname"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="textPersonName"
    android:textColor="@android:color/black" />

<TextView
    android:id="@+id/pwd_label"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Password"
    android:textColor="@android:color/black" />

<EditText
    android:id="@+id/pwd"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="textPassword"
    android:textColor="@android:color/black" />

<Button
    android:id="@+id/login"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Login" />
</LinearLayout>

```

- activity_home.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:orientation="vertical"
    tools:context=".HomeActivity">

    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"

```

```
        android:text="Hello, "  
        android:textAlignment="center"  
        android:textColor="@android:color/black"  
        android:textSize="18sp" />  
</LinearLayout>
```

- MainActivity.java

```
package com.android_lab.intents;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.content.Intent;  
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 implements  
View.OnClickListener {  
  
    private EditText uname, pwd;  
    private Button login;  
  
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_main);  
  
        uname = findViewById(R.id.uname);  
        pwd = findViewById(R.id.pwd);  
        login = findViewById(R.id.login);  
        login.setOnClickListener(this);  
    }  
  
    @Override  
    public void onClick(View view) {  
        String u = uname.getText().toString();  
        String p = pwd.getText().toString();  
  
        if(u.equals("cvrcsec") && p.equals("password")) {  
            Intent intent = new Intent(this, HomeActivity.class);  
            intent.putExtra("uname", u);  
            startActivity(intent);  
        } else {  
            Toast.makeText(this, "Invalid Username/Password",  
Toast.LENGTH_LONG).show();  
        }  
    }  
}
```

- HomeActivity.java

```
package com.android_lab.intents;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.widget.TextView;

public class HomeActivity extends AppCompatActivity {

    private TextView textView;

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

        textView = findViewById(R.id.textview);

        Intent intent = getIntent();
        textView.setText("Welcome, " +
intent.getStringExtra("uname"));
    }
}
```

Question 4: Write a program to demonstrate the use of Bundles

- AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
package="com.android_lab.bundles">

    <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=".ConfirmActivity"
android:parentActivityName=".MainActivity"></activity>
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
```

```

        <category
android:name="android.intent.category.LAUNCHER" />
    </intent-filter>
</activity>
</application>

</manifest>

```

- 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:orientation="vertical"
tools:context=".MainActivity">

    <TextView
        android:id="@+id/name_label"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Name"
        android:textColor="@android:color/black" />

    <EditText
        android:id="@+id/cname"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"
        android:textColor="@android:color/black" />

    <TextView
        android:id="@+id/age_label"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="age"
        android:textColor="@android:color/black" />

    <EditText
        android:id="@+id/age"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="number"
        android:textColor="@android:color/black" />

```



```

<TextView
    android:id="@+id/gender_label"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Gender"
    android:textColor="@android:color/black" />

<Spinner
    android:id="@+id/gender"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:entries="@array/genders" />

<Button
    android:id="@+id/done"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Done"
    android:textColor="@android:color/black" />
</LinearLayout>

```

- activity_confirm.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:orientation="vertical"
    tools:context=".ConfirmActivity">

    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Your Information"
        android:textColor="@android:color/black"
        android:textSize="18sp" />

    <TextView
        android:id="@+id/cname"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Name"
        android:textColor="@android:color/black"
        android:textSize="14sp" />

    <TextView
        android:id="@+id/cage"

```

```

        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Age"
        android:textColor="@android:color/black"
        android:textSize="14sp" />

<TextView
    android:id="@+id/cgender"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Gender"
    android:textColor="@android:color/black"
    android:textSize="14sp" />

<Button
    android:id="@+id/confirm"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Confirm"
    android:textColor="@android:color/black" />
</LinearLayout>

```

- res/values/arrays/xml

```

<?xml version="1.0" encoding="utf-8"?>
<resources>
    <string-array name="genders">
        <item>Male</item>
        <item>Female</item>
        <item>Prefer not to say</item>
    </string-array>
</resources>

```

- MainActivity.java

```

package com.android_lab.bundles;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Spinner;

public class MainActivity extends AppCompatActivity implements
View.OnClickListener {

```

```

        private EditText name, age;
        private Spinner gender;
        private Button done;

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

            name = findViewById(R.id.cname);
            age = findViewById(R.id.age);
            gender = findViewById(R.id.gender);

            done = findViewById(R.id.done);
            done.setOnClickListener(this);
        }

        @Override
        public void onClick(View view) {
            Bundle bundle = new Bundle();
            bundle.putString("name", name.getText().toString());
            bundle.putString("age", age.getText().toString());
            bundle.putString("gender",
gender.getSelectedItem().toString());

            Intent intent = new Intent(this, ConfirmActivity.class);
            intent.putExtra("bundle", bundle);
            startActivity(intent);
        }
    }
}

```

- ConfirmActivity.java

```

package com.android_lab.bundles;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

public class ConfirmActivity extends AppCompatActivity implements
View.OnClickListener {

    private TextView name, age, gender;
    private Button confirm;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
    }
}

```

```

        setContentView(R.layout.activity_confirm);

        name = findViewById(R.id.cname);
        age = findViewById(R.id.cage);
        gender = findViewById(R.id.cgender);

        confirm = findViewById(R.id.confirm);
        confirm.setOnClickListener(this);

        Bundle bundle = getIntent().getBundleExtra("bundle");
        name.setText("Name: " + bundle.getString("name"));
        age.setText("Age: " + bundle.getString("age"));
        gender.setText("Gender: " + bundle.getString("gender"));
    }

    @Override
    public void onClick(View view) {
        finish();
    }
}

```

Question 5: Draw the diagram of an Android App Lifecycle and write a program with all the methods

- AndroidManifest.xml

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
package="com.android_lab.activity_lifecycle">

    <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>
    </application>

</manifest>

```

- MainActivity.java

```
package com.android_lab.activity_lifecycle;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

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

        System.out.println("onCreate()");
    }

    @Override
    protected void onStart() {
        super.onStart();

        System.out.println("onStart()");
    }

    @Override
    protected void onResume() {
        super.onResume();

        System.out.println("onResume()");
    }

    @Override
    protected void onPause() {
        super.onPause();

        System.out.println("onPause()");
    }

    @Override
    protected void onStop() {
        super.onStop();

        System.out.println("onStop()");
    }

    @Override
    protected void onDestroy() {
        super.onDestroy();
    }
}
```

```

        System.out.println("onDestroy()");
    }
}

```

- Output

Output in Run Tab:

```

I/System.out: onCreate()      // App Starts
I/System.out: onStart()
I/System.out: onResume()
I/System.out: onPause()      // User presses Home Button
I/System.out: onStop()
I/System.out: onStart()      // User open app again
I/System.out: onResume()
I/System.out: onPause()      // User presses Recent Apps Button
I/System.out: onStop()
I/System.out: onDestroy()    // User close app in Recent Apps

Application Terminated

```

Question 6: Create an Alert Dialog with three buttons

- AndroidManifest.xml

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.android_lab.alert_dialog">

    <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>
    </application>

</manifest>

```

- 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:orientation="vertical"
    tools:context=".MainActivity" >

    <Button
        android:id="@+id/button"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Open " />
</LinearLayout>
```

- MainActivity.java

```
package com.android_lab.alert_dialog;

import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;

import android.content.DialogInterface;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity implements
View.OnClickListener {

    private Button button;

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

        button = findViewById(R.id.button);
        button.setOnClickListener(this);
    }

    @Override
    public void onClick(View view) {
        AlertDialog.Builder builder = new AlertDialog.Builder(this);
        builder.setMessage("You need to login to use this App")
```

```

        .setPositiveButton("Log In", new
DialogInterface.OnClickListener() {
            @Override
            public void onClick(DialogInterface
dialogInterface, int i) {
                Toast.makeText(getApplicationContext(), "Log
In button pressed", Toast.LENGTH_LONG).show();
            }
        })
        .setNeutralButton("Sign Up", new
DialogInterface.OnClickListener() {
            @Override
            public void onClick(DialogInterface
dialogInterface, int i) {
                Toast.makeText(getApplicationContext(),
"Sign Up button pressed", Toast.LENGTH_LONG).show();
            }
        })
        .setNegativeButton("Cancel", new
DialogInterface.OnClickListener() {
            @Override
            public void onClick(DialogInterface
dialogInterface, int i) {
                Toast.makeText(getApplicationContext(),
"Cancel button pressed", Toast.LENGTH_LONG).show();
            }
        })
        .setOnDismissListener(new
DialogInterface.OnDismissListener() {
            @Override
            public void onDismiss(DialogInterface
dialogInterface) {
                Toast.makeText(getApplicationContext(),
"Alert Dialog dismissed", Toast.LENGTH_LONG).show();
            }
        })
        .create()
        .show();
    }
}

```

Question 7: Create a Progress Bar

- AndroidManifest.xml

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.android_lab.progress_bar">

    <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>
    </application>

</manifest>

```

- 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"
    tools:context=".MainActivity"
    android:orientation="vertical"
    android:layout_gravity="center_vertical">

    <Button
        android:id="@+id/button"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Download File" />

</LinearLayout>

```

- MainActivity.java

```

package com.android_lab.progress_bar;

import androidx.appcompat.app.AppCompatActivity;

import android.app.ProgressDialog;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;

```

```

import android.widget.Button;
import android.widget.ProgressBar;

public class MainActivity extends AppCompatActivity implements
View.OnClickListener {

    private Button button;
    private Handler progressBarHandler = new Handler();
    ProgressDialog progressBar;
    int progressBarStatus = 0;

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

        button = findViewById(R.id.button);
        button.setOnClickListener(this);
    }

    @Override
    public void onClick(View view) {
        progressBar = new ProgressDialog(this);
        progressBar.setIndeterminate(false);
        progressBar.setTitle("Downloading File");

        progressBar.setProgressStyle(ProgressDialog.STYLE_HORIZONTAL);
        progressBar.setCanceledOnTouchOutside(false);
        progressBar.setCancelable(false);
        progressBar.setMax(100);
        progressBar.setProgress(0);
        progressBar.show();

        downloadFile();
    }

    private void downloadFile() {
        // This function doesn't download a file, it just updates
        progress bar
        progressBarStatus = 0;

        new Thread(new Runnable() {
            @Override
            public void run() {
                while (getProgressStatus() < 100) {
                    progressBarHandler.post(new Runnable() {
                        @Override
                        public void run() {

progressBar.setProgress(updateProgressStatus());
                        }
                    });
                }

                try {

```

```

        Thread.sleep(100);
    } catch (InterruptedException e) {
        e.printStackTrace();
    }
}

progressBar.dismiss();
}
}).start();
}

public int getProgressStatus() {
    return progressBarStatus;
}

public int updateProgressStatus() {
    return ++progressBarStatus;
}
}

```

Question 8: Demonstrate Notifications in Android. Create and show a Simple Notification and another Notification when tapped open the Dialer

- AndroidManifest.xml

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.android_lab.notifications">

    <application
        android:name=".AppDelegate"
        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>
    </application>

</manifest>

```

- 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"
tools:context=".MainActivity"
android:orientation="vertical">

    <EditText
        android:id="@+id/title"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Title" />

    <EditText
        android:id="@+id/message"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Message" />

    <Button
        android:id="@+id/show_notification"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Show Notification" />

    <EditText
        android:id="@+id/phone_no"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Phone Number"
        android:inputType="phone" />

    <Button
        android:id="@+id/show_missed_notification"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Show Missed Call Notification" />

</LinearLayout>

```

- AppDelegate.java

```

package com.android_lab.notifications;

import android.app.Application;
import android.app.NotificationChannel;
import android.app.NotificationManager;

```

```

import android.os.Build;

public class AppDelegate extends Application {

    final static String CHANNEL_ID_1 = "messages";
    final static String CHANNEL_ID_2 = "missed_calls";

    @Override
    public void onCreate() {
        super.onCreate();

        createNotificationChannels();
    }

    private void createNotificationChannels() {
        if(Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
            NotificationChannel channel_1 = new
NotificationChannel(CHANNEL_ID_1,
                    "Messages",
                    NotificationManager.IMPORTANCE_HIGH
                    );

            NotificationChannel channel_2 = new
NotificationChannel(CHANNEL_ID_2,
                    "Missed calls",
                    NotificationManager.IMPORTANCE_HIGH
                    );

            NotificationManager notificationManager =
getSystemService(NotificationManager.class);

notificationManager.createNotificationChannel(channel_1);

notificationManager.createNotificationChannel(channel_2);
        }
    }
}

```

- MainActivity.java

```

package com.android_lab.notifications;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.NotificationCompat;
import androidx.core.app.NotificationManagerCompat;

import android.app.PendingIntent;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;

```

```

import android.widget.Button;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity implements
View.OnClickListener {

    private EditText title, message, phone_no;
    private Button showNotification, showMissedNotification;

    private final static int notification_id = 1;

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

        title = findViewById(R.id.title);
        message = findViewById(R.id.message);
        phone_no = findViewById(R.id.phone_no);

        showNotification = findViewById(R.id.show_notification);
        showNotification.setOnClickListener(this);
        showMissedNotification =
findViewById(R.id.show_missed_notification);
        showMissedNotification.setOnClickListener(this);
    }

    @Override
    public void onClick(View view) {
        NotificationManagerCompat notificationManager =
NotificationManagerCompat.from(this);
        NotificationCompat.Builder notificationBuilder = new
NotificationCompat.Builder(this, AppDelegate.CHANNEL_ID_1)
            .setSmallIcon(R.drawable.ic_launcher_foreground)
            .setAutoCancel(true);

        switch (view.getId()) {
            case R.id.show_notification:
                String t = title.getText().toString();
                String m = message.getText().toString();

                notificationBuilder.setContentTitle(t)
                    .setContentText(m);
                break;

            case R.id.show_missed_notification:
                String phone = phone_no.getText().toString();

                Intent intent = new Intent(Intent.ACTION_DIAL);
                intent.setData(Uri.parse("tel:" + phone));
                PendingIntent pendingIntent =
PendingIntent.getActivity(this, 0, intent, 0);

                notificationBuilder.setContentTitle("Missed Call")

```

```

                .setContentText("You have a missed call from
" + phone)
                .setContentIntent(pendingIntent);
            break;
        }

        notificationManager.notify(notification_id,
notificationBuilder.build());
    }
}

```

Question 9: Create an application to make insert, update, delete and retrieve operations on database

- AndroidManifest.xml

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.android_lab.sqlitedemo">

    <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=".DetailActivity"
android:parentActivityName=".MainActivity"/>
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category
android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>

```

- 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"
        tools:context=".MainActivity"
        android:orientation="vertical">

        <androidx.appcompat.widget.Toolbar
            android:id="@+id/toolbar"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:background="@color/colorPrimary"
            android:theme="@style/ToolBarTheme"
            app:titleTextColor="@android:color/white">

            <ImageButton
                android:id="@+id/add"
                android:layout_width="wrap_content"
                android:layout_height="match_parent"
                android:layout_gravity="right"
                android:layout_marginEnd="20dp"
                android:background="@android:color/transparent"
                android:src="@drawable/ic_add_white_24dp" />

            <ImageButton
                android:id="@+id/reload"
                android:layout_width="wrap_content"
                android:layout_height="match_parent"
                android:layout_gravity="right"
                android:layout_marginEnd="20dp"
                android:background="@android:color/transparent"
                android:src="@drawable/ic_refresh_white_24dp" />

        </androidx.appcompat.widget.Toolbar>

        <androidx.recyclerview.widget.RecyclerView
            android:id="@+id/recyclerView"
            android:layout_width="match_parent"
            android:layout_height="match_parent" />

    </LinearLayout>

```

- activity_detail.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"
    tools:context=".DetailActivity"
    android:orientation="vertical" >

```



```

<androidx.appcompat.widget.Toolbar
    android:id="@+id/toolbar"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:background="@color/colorPrimary"
    android:theme="@style/ToolBarTheme"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:titleTextColor="@android:color/white">

    <ImageButton
        android:id="@+id/done"
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:layout_gravity="right"
        android:layout_marginEnd="20dp"
        android:background="@android:color/transparent"
        android:src="@drawable/button_background" />

    <ImageButton
        android:id="@+id/delete"
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:layout_gravity="right"
        android:layout_marginEnd="20dp"
        android:background="@android:color/transparent"
        android:src="@drawable/ic_delete_white_24dp"
        android:visibility="gone" />

</androidx.appcompat.widget.Toolbar>

<EditText
    android:id="@+id/name"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:ems="10"
    android:hint="Name"
    android:inputType="textPersonName" />

<EditText
    android:id="@+id/roll_no"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:ems="10"
    android:hint="Roll No"
    android:inputType="textPersonName" />

<EditText
    android:id="@+id/age"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:ems="10"

```

```
        android:hint="Age"
        android:inputType="number" />

</LinearLayout>
```

- cell_layout.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="wrap_content"
    android:orientation="vertical">

    <TextView
        android:id="@+id/title"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginTop="8dp"
        android:layout_marginEnd="16dp"
        android:text="Title"
        android:textColor="@android:color/black"
        android:textSize="18sp" />

    <TextView
        android:id="@+id/subtitle"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginTop="4dp"
        android:layout_marginEnd="16dp"
        android:layout_marginBottom="8dp"
        android:text="Subtitle"
        android:textColor="@android:color/black"/>

</LinearLayout>
```

- MainActivity.java

```
package com.android_lab.sqlitedemo;

import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageButton;
import android.widget.Toast;
```

```
import androidx.appcompat.app.AppCompatActivity;
import androidx.appcompat.widget.Toolbar;
import androidx.recyclerview.widget.DividerItemDecoration;
import androidx.recyclerview.widget.LinearLayoutManager;
import androidx.recyclerview.widget.RecyclerView;

import java.util.ArrayList;

public class MainActivity extends AppCompatActivity implements
View.OnClickListener, StudentAdapter.OnClicklistener {

    private Toolbar toolbar;
    private ImageButton add, reload;

    private RecyclerView recyclerView;
    private StudentAdapter mAdapter;
    private RecyclerView.LayoutManager layoutManager;

    private ArrayList<Student> students;
    private StudentDbHelper dbHelper;

    public static String STUDENT_ID = "MainActivity.Student";

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

        setupToolbar();
        setupRecyclerView();
    }

    @Override
    protected void onStart() {
        super.onStart();

        dbHelper = new StudentDbHelper(this);
        reloadData();
    }

    @Override
    protected void onDestroy() {
        dbHelper.close();
        super.onDestroy();
    }

    private void setupToolbar() {
        toolbar = findViewById(R.id.toolbar);
        setSupportActionBar(toolbar);

        add = findViewById(R.id.add);
        add.setOnClickListener(this);
        reload = findViewById(R.id.reload);
    }
}
```

```

        reload.setOnClickListener(this);
    }

    private void setupRecyclerView() {
        recyclerView = findViewById(R.id.recyclerView);

        recyclerView.setHasFixedSize(true);

        layoutManager = new LinearLayoutManager(this);
        recyclerView.setLayoutManager(layoutManager);

        mAdapter = new StudentAdapter(students, this);
        recyclerView.setAdapter(mAdapter);

        recyclerView.addItemDecoration(new
DividerItemDecoration(recyclerView.getContext(),
DividerItemDecoration.VERTICAL));
    }

    private void reloadData() {
        students = dbHelper.getAll();
        mAdapter.update(students);
        Toast.makeText(this, "Data Loaded",
Toast.LENGTH_SHORT).show();
    }

    @Override
    public void onClick(View view) {
        switch (view.getId()) {
            case R.id.add:
                startActivity(new Intent(this,
DetailActivity.class));
                break;
            case R.id.reload:
                Toast.makeText(this, "Reloading Data",
Toast.LENGTH_SHORT).show();
                reloadData();
                break;
        }
    }

    @Override
    public void onClick(int position) {
        Intent intent = new Intent(this, DetailActivity.class);
        intent.putExtra(STUDENT_ID, students.get(position));
        startActivity(intent);
    }
}

```

- DetailActivity.java

```
package com.android_lab.sqlitedemo;

import android.content.Intent;
import android.os.Bundle;
import android.text.Editable;
import android.text.TextWatcher;
import android.view.View;
import android.widget.EditText;
import android.widget.ImageButton;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;
import androidx.appcompat.widget.Toolbar;

public class DetailActivity extends AppCompatActivity implements
View.OnClickListener, TextWatcher {

    private Toolbar toolbar;
    private ImageButton done, delete;

    private EditText name, rollNo, age;

    private Student student;
    private StudentDbHelper dbHelper;

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

        dbHelper = new StudentDbHelper(this);

        setupToolbar();
        initializeForm();
        setupForm();
    }

    @Override
    protected void onDestroy() {
        dbHelper.close();
        super.onDestroy();
    }

    private void setupToolbar() {
        toolbar = findViewById(R.id.toolbar);
        setSupportActionBar(toolbar);
        getSupportActionBar().setDisplayHomeAsUpEnabled(true);
        getSupportActionBar().setDisplayShowHomeEnabled(true);

        done = findViewById(R.id.done);
        done.setOnClickListener(this);
        delete = findViewById(R.id.delete);
        delete.setOnClickListener(this);
    }
}
```

```

    }

    private void initializeForm() {
        name = findViewById(R.id.name);
        rollNo = findViewById(R.id.roll_no);
        age = findViewById(R.id.age);
    }

    private void setupForm() {
        Intent intent = getIntent();
        if(intent.hasExtra(MainActivity.STUDENT_ID)) {
            student = (Student)
intent.getSerializableExtra(MainActivity.STUDENT_ID);

            setTitle(student.name + " Details");
            delete.setVisibility(View.VISIBLE);

            name.setText(student.name);
            rollNo.setText(student.rollNo);
            age.setText(String.valueOf(student.age));
        } else {
            student = null;

            setTitle("New Student");
            done.setEnabled(false);
        }

        name.addTextChangedListener(this);
        rollNo.addTextChangedListener(this);
        age.addTextChangedListener(this);
    }

    private Student getUpdatedObject() {
        if(student == null)
            return new Student(
                name.getText().toString(),
                rollNo.getText().toString(),
                Integer.parseInt(age.getText().toString()));

        student.name = name.getText().toString();
        student.rollNo = rollNo.getText().toString();
        student.age = Integer.parseInt(age.getText().toString());

        return student;
    }

    private void update(Student student) {
        if(this.student == null) {
            dbHelper.insert(student);
            Toast.makeText(this, "Inserted New Record",
Toast.LENGTH_SHORT).show();
        } else {
            dbHelper.update(student);
            Toast.makeText(this, "Updated Record",

```

```

Toast.LENGTH_SHORT).show();
    }
}

@Override
public void onClick(View view) {
    switch (view.getId()) {
        case R.id.done:
            update(getUpdatedObject());
            finish();
            break;
        case R.id.delete:
            dbHelper.delete(student);
            Toast.makeText(this, "Deleted Record",
Toast.LENGTH_SHORT).show();
            finish();
            break;
    }
}

@Override
public void beforeTextChanged(CharSequence charSequence, int i,
int i1, int i2) {}

@Override
public void onTextChanged(CharSequence charSequence, int i, int
i1, int i2) {}

@Override
public void afterTextChanged(Editable editable) {
    done.setEnabled(
        name.getText().toString().length() > 0 &&
        rollNo.getText().toString().length() > 0 &&
        age.getText().toString().length() > 0
    );
}
}

```

- Student.java

```

package com.android_lab.sqlitedemo;

import java.io.Serializable;

public class Student implements Serializable {
    long _ID;
    String name;
    String rollNo;
    int age;

    public Student(String name, String rollNo, int age) {

```

```

        this.name = name;
        this.rollNo = rollNo;
        this.age = age;
    }
}

```

- StudentAdapter.java

```

package com.android_lab.sqlitedemo;

import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.TextView;

import androidx.annotation.NonNull;
import androidx.recyclerview.widget.RecyclerView;

import java.util.ArrayList;

class StudentAdapter extends
RecyclerView.Adapter<StudentAdapter.StudentViewHolder> {

    private ArrayList<Student> dataset;
    private String[] courses;

    private OnClickListener mListener;

    public interface OnClickListener {
        public void onClick(int position);
    }

    public static class StudentViewHolder extends
RecyclerView.ViewHolder {
        TextView title, subtitle;

        public StudentViewHolder(View v, final OnClickListener
mListener) {
            super(v);
            title = v.findViewById(R.id.title);
            subtitle = v.findViewById(R.id.subtitle);

            v.setOnClickListener(new View.OnClickListener() {
                @Override
                public void onClick(View view) {
                    mListener.onClick(getAdapterPosition());
                }
            });
        }
    }
}

```



```

        public StudentAdapter(ArrayList<Student> dataset,
        OnClickListener mListener) {
            this.dataset = dataset;
            this.mListener = mListener;
        }

        @NonNull
        @Override
        public StudentViewHolder onCreateViewHolder(@NonNull ViewGroup
        parent, int viewType) {
            View v = LayoutInflater.from(parent.getContext())
            .inflate(R.layout.cell_layout, parent, false);

            StudentViewHolder vh = new StudentViewHolder(v, mListener);
            return vh;
        }

        @Override
        public void onBindViewHolder(@NonNull StudentViewHolder holder,
        int position) {
            Student student = dataset.get(position);
            holder.title.setText(student.name);
            holder.subtitle.setText(student.rollNo);
        }

        @Override
        public int getItemCount() {
            return dataset.size();
        }

        public void update(ArrayList<Student> dataset) {
            this.dataset = dataset;
            this.notifyDataSetChanged();
        }
    }

```

- StudentContract.java

```

package com.android_lab.sqlitedemo;

import android.provider.BaseColumns;

public class StudentContract {

    private StudentContract() {}

    public static class StudentEntry implements BaseColumns {
        public static final String TABLE_NAME = "students";
        public static final String NAME = "name";
        public static final String ROLL_NO = "roll_no";
    }
}

```

```

        public static final String AGE = "age";
    }
}

```

- StudentDbHelper.java

```

package com.android_lab.sqlitedemo;

import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;

import java.util.ArrayList;

public class StudentDbHelper extends SQLiteOpenHelper {

    public static final int DATABASE_VERSION = 1;
    public static final String DATABASE_NAME = "StudentDB.db";

    private static final String SQL_CREATE_ENTRIES =
        "CREATE TABLE " +
StudentContract.StudentEntry.TABLE_NAME + " (" +
        StudentContract.StudentEntry._ID + " INTEGER
PRIMARY KEY, " +
        StudentContract.StudentEntry.NAME + " TEXT, " +
        StudentContract.StudentEntry.ROLL_NO + " TEXT, "
+
        StudentContract.StudentEntry.AGE + " INTEGER)";

    private static final String SQL_DELETE_ENTRIES =
        "DROP TABLE IF EXISTS " +
StudentContract.StudentEntry.TABLE_NAME;

    public StudentDbHelper(Context context) {
        super(context, DATABASE_NAME, null, DATABASE_VERSION);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        db.execSQL(SQL_CREATE_ENTRIES);
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int i, int i1) {
        db.execSQL(SQL_DELETE_ENTRIES);
        onCreate(db);
    }

    private ContentValues getContentValues(Student student) {

```

```

        ContentValues values = new ContentValues();
        values.put(StudentContract.StudentEntry.NAME, student.name);
        values.put(StudentContract.StudentEntry.ROLL_NO,
student.rollNo);
        values.put(StudentContract.StudentEntry.AGE, student.age);
        return values;
    }

    public long insert(Student student) {
        SQLiteDatabase db = getWritableDatabase();

        return db.insert(StudentContract.StudentEntry.TABLE_NAME,
null, getContentValues(student));
    }

    public ArrayList<Student> getAll() {
        SQLiteDatabase db = getReadableDatabase();

        Cursor cursor = db.query(
            StudentContract.StudentEntry.TABLE_NAME,
            null, null, null, null, null, null
        );

        ArrayList<Student> students = new ArrayList<>();

        while(cursor.moveToNext()) {
            Student student = new Student(

cursor.getString(cursor.getColumnIndexOrThrow(StudentContract.StudentE
ntry.NAME)),

cursor.getString(cursor.getColumnIndexOrThrow(StudentContract.StudentE
ntry.ROLL_NO)),

cursor.getInt(cursor.getColumnIndexOrThrow(StudentContract.StudentEntr
y.AGE))
                );
            student._ID =
cursor.getLong(cursor.getColumnIndexOrThrow(StudentContract.StudentEnt
ry._ID));
            students.add(student);
        }
        cursor.close();

        return students;
    }

    public int update(Student student) {
        SQLiteDatabase db = getWritableDatabase();

        ContentValues values = getContentValues(student);
        String selection = StudentContract.StudentEntry._ID + " =
?";
        String selectionArgs[] = { String.valueOf(student._ID) };

```

```

        return db.update(
            StudentContract.StudentEntry.TABLE_NAME,
            values,
            selection,
            selectionArgs
        );
    }

    public int delete(long id) {
        SQLiteDatabase db = getReadableDatabase();

        String selection = StudentContract.StudentEntry._ID + " =
?";
        String selectionArgs[] = { String.valueOf(id) };

        return db.delete(
            StudentContract.StudentEntry.TABLE_NAME,
            selection,
            selectionArgs
        );
    }

    public int delete(Student student) {
        return delete(student._ID);
    }
}

```

Question 10: Develop an application to display images using gallery view and display it on screen;

- AndroidManifest.xml

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.android_lab.gallery">

    <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>
    </application>
</manifest>

```

```
        </intent-filter>
    </activity>
</application>

</manifest>
```

- 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"
    tools:context=".MainActivity"
    android:orientation="vertical">

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="match_parent"
        android:layout_height="420dp" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:textAlignment="center"/>

    <Gallery
        android:id="@+id/gallery"
        android:layout_width="match_parent"
        android:layout_height="100dp"
        android:spacing="20dp" />

</LinearLayout>
```

- MainActivity.java

```
package com.android_lab.gallery;

import androidx.appcompat.app.AppCompatActivity;

import android.content.res.Resources;
import android.os.Bundle;
import android.text.Layout;
import android.view.View;
import android.view.ViewGroup;
import android.widget.AdapterView;
```

```

import android.widget.Gallery;
import android.widget.ImageView;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity implements
AdapterView.OnItemClickListener {

    private int dataset[] = {R.drawable.elon_musk,
R.drawable.bill_gates, R.drawable.rdj,
        R.drawable.roadster, R.drawable.model_s,
R.drawable.falcon_9, R.drawable.starship};

    private ImageView imageView;
    private TextView textView;
    private Gallery gallery;

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

        imageView = findViewById(R.id.imageView);
        textView = findViewById(R.id.textView);

        gallery = findViewById(R.id.gallery);
        gallery.setAdapter(new MyAdapter(this, dataset));
        gallery.setOnItemClickListener(this);
    }

    @Override
    public void onItemClick(AdapterView<?> adapterView, View view,
int i, long l) {
        imageView.setImageResource(dataset[i]);

        textView.setText(getResources().getResourceEntryName(dataset[i]));
    }
}

```

- MyAdapter.java

```

package com.android_lab.gallery;

import android.content.Context;
import android.view.View;
import android.view.ViewGroup;
import android.widget.BaseAdapter;
import android.widget.Gallery;
import android.widget.ImageView;

public class MyAdapter extends BaseAdapter {

```

```

private final Context context;
private int dataset[];

public MyAdapter(Context context, int dataset[]) {
    this.context = context;
    this.dataset = dataset;
}

@Override
public int getCount() {
    return dataset.length;
}

@Override
public Object getItem(int i) {
    return i;
}

@Override
public long getItemId(int i) {
    return i;
}

@Override
public View getView(int i, View view, ViewGroup viewGroup) {
    ImageView imageView = new ImageView(context);
    imageView.setImageResource(dataset[i]);
    imageView.setLayoutParams(new Gallery.LayoutParams(400,
400));
    imageView.setScaleType(ImageView.ScaleType.FIT_CENTER);
    return imageView;
}
}

```

Question 11: Demonstrate the use of shared preferences object by developing an application

- AndroidManifest.xml

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.android_lab.shared_prefs">

    <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>
</application>

</manifest>

```

- 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"
    tools:context=".MainActivity"
    android:orientation="vertical">

    <EditText
        android:id="@+id/name"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Name" />

    <EditText
        android:id="@+id/roll_no"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Roll No" />

    <Button
        android:id="@+id/save"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Save Preferences"
        android:onClick="save"/>

    <Button
        android:id="@+id/retrieve"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Retrieve Preferences"
        android:onClick="retrieve" />

    <Button
        android:id="@+id/clear"

```



```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Clear Preferences"
        android:onClick="clear" />

</LinearLayout>
```

- MainActivity.java

```
package com.android_lab.shared_prefs;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Context;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    private EditText name, rollNo;

    public static final String USER_PREF = "USER_PREF" ;
    public static final String NAME_KEY = "NAME";
    public static final String ROLLNO_KEY = "ROLLNO";

    private SharedPreferences sharedPreferences;

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

        name = findViewById(R.id.name);
        rollNo = findViewById(R.id.roll_no);

        sharedPreferences = getSharedPreferences(USER_PREF,
Context.MODE_PRIVATE);
    }

    public void save(View view) {
        String n = name.getText().toString();
        String r = rollNo.getText().toString();

        SharedPreferences.Editor editor = sharedPreferences.edit();
        editor.putString(NAME_KEY, n);
        editor.putString(ROLLNO_KEY, r);
        editor.commit();
    }
}
```

```
        Toast.makeText(this, "Saved Shared Preferences",
Toast.LENGTH_LONG).show();
    }

    public void retrieve(View view) {
        if(sharedPreferences.contains(NAME_KEY))
            name.setText(sharedPreferences.getString(NAME_KEY, ""));

        if(sharedPreferences.contains(ROLLNO_KEY))
            rollNo.setText((sharedPreferences.getString(ROLLNO_KEY,
"")));

        Toast.makeText(this, "Retrieved Shared Preferences",
Toast.LENGTH_LONG).show();
    }

    public void clear(View view) {
        name.setText("");
        rollNo.setText("");

        SharedPreferences.Editor editor = sharedPreferences.edit();
        editor.clear();
        editor.commit();

        Toast.makeText(this, "Cleared Shared Preferences",
Toast.LENGTH_LONG).show();
    }
}
```