Q1 (A) Write an Android Program to demonstrate Activity life Cycle

MainActivity.java :

```
package com.example.activity_life;
import android.annotation.SuppressLint;
import android.app.Activity;
import android.os.Bundle;
import android.widget.Toast;
@SuppressLint("NewApi")
public class MainActivity extends Activity {
    @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      notify("onCreate");
   }
    @Override
   protected void onPause() {
      super.onPause();
      notify("onPause");
   }
    @Override
   protected void onResume() {
      super.onResume();
      notify("onResume");
   }
    @Override
   protected void onStop() {
      super.onStop();
      notify("onStop");
   }
    @Override
   protected void onDestroy() {
      super.onDestroy();
      notify("onDestroy");
   }
    @Override
   protected void onRestoreInstanceState(Bundle savedInstanceState) {
      super.onRestoreInstanceState(savedInstanceState);
```

```
        notify("onRestoreInstanceState");
    }
     @Override
    protected void onSaveInstanceState(Bundle outState) {
        super.onSaveInstanceState(outState);
        notify("onSaveInstanceState");
    }
     private void notify(String methodName) {
        String name = this.getClass().getName();
        String[] strings = name.split("\\.");
        Toast.makeText(getApplicationContext(),
                methodName + "" + strings[strings.length - 1],
                Toast.LENGTH_LONG).show();
    }

}
```

Activity_main.xml :

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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="example.activitylifecycle.MainActivity">
     <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
  </android.support.constraint.ConstraintLayout>
```

(B) Create table Customer (id, name, address, phno). Create Android Application for performing the following operation on the table. (usingsqlite database)
i) Insert New Customer Details. ii) Show All the Customer Details

MainActivity.java :

```
package com.example.slip1_2;
import androidx.appcompat.app.AppCompatActivity;
import android.content.ContentValues;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.*;

public class MainActivity extends AppCompatActivity {
    private EditText nameEditText;
    private EditText addressEditText;
    private EditText phoneNumberEditText;
    private Button addButton;
    private ListView customerListView;

    private SQLiteDatabase database;
    private Cursor cursor;
    private SimpleCursorAdapter adapter;

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

        nameEditText = findViewById(R.id.name_edit_text);
        addressEditText = findViewById(R.id.address_edit_text);
        phoneNumberEditText = findViewById(R.id.phone_number_edit_text);
        addButton = findViewById(R.id.add_button);
        customerListView = findViewById(R.id.customer_list_view);

        database = new DatabaseHelper(this).getWritableDatabase();

        addButton.setOnClickListener(new View.OnClickListener() {
            @Override
```

```
            public void onClick(View v) {
                String name = nameEditText.getText().toString();
                String address = addressEditText.getText().toString();
                String phoneNumber =
phoneNumberEditText.getText().toString();

                ContentValues values = new ContentValues();
                values.put("name", name);
                values.put("address", address);
                values.put("phno", phoneNumber);

                long result = database.insert("Customer", null, values);
                if (result == -1) {
                    Toast.makeText(MainActivity.this, "Failed to add
customer", Toast.LENGTH_SHORT).show();
                } else {
                    Toast.makeText(MainActivity.this, "Customer added
successfully", Toast.LENGTH_SHORT).show();
                    nameEditText.setText("");
                    addressEditText.setText("");
                    phoneNumberEditText.setText("");
                    cursor = database.rawQuery("SELECT * FROM Customer",
null);
                    adapter.swapCursor(cursor);
                }
            }
        });

        cursor = database.rawQuery("SELECT * FROM Customer", null);
        adapter = new SimpleCursorAdapter(this,
                R.layout.customer_item,
                cursor,
                new String[]{"name", "address", "phno"},
                new int[]{R.id.name_text_view, R.id.address_text_view,
R.id.phone_number_text_view},
                0);
        customerListView.setAdapter(adapter);
    }
@Override
    protected void onDestroy() {
```

```
        super.onDestroy();
        cursor.close();
        database.close();
    }
}
```

DatabaseHelper.java :

```
package com.example.slip1_2;
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.*;

public class DatabaseHelper extends SQLiteOpenHelper {
    private static final String DATABASE_NAME = "customers";
    private static final int DATABASE_VERSION = 1;
    private static final String TABLE_NAME = "Customer";
    private static final String COLUMN_ID = "_id";
    private static final String COLUMN_NAME = "name";
    private static final String COLUMN_ADDRESS = "address";
    private static final String COLUMN_PHONE_NUMBER = "phno";

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

    @Override
    public void onCreate(SQLiteDatabase db) {
        String createTable = " CREATE TABLE " + TABLE_NAME
                + "("+ COLUMN_ID + " INTEGER PRIMARY KEY AUTOINCREMENT, "
                + COLUMN_NAME + " TEXT, "
                + COLUMN_ADDRESS + " TEXT,"
                + COLUMN_PHONE_NUMBER + " TEXT)";
        db.execSQL(createTable);
    }

    @Override
```

```
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int
newVersion) {
        db.execSQL("DROP TABLE IF EXISTS " + TABLE_NAME + ";");
        onCreate(db);
    }

    public boolean insertCustomer(Customer customer) {
        SQLiteDatabase db = getWritableDatabase();

        ContentValues values = new ContentValues();
        values.put(COLUMN_NAME, customer.getName());
        values.put(COLUMN_ADDRESS, customer.getAddress());
        values.put(COLUMN_PHONE_NUMBER, customer.getPhoneNumber());

        long newRowId = db.insert(TABLE_NAME, null, values);
        return newRowId != -1;
    }

    public List<Customer> getAllCustomers() {
        SQLiteDatabase db = getReadableDatabase();

        String[] projection = {
                COLUMN_ID,
                COLUMN_NAME,
                COLUMN_ADDRESS,
                COLUMN_PHONE_NUMBER
        };

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

        List<Customer> customers = new ArrayList<>();
        while (cursor.moveToNext()) {
```

```
            int id = cursor.getInt(cursor.getColumnIndex(COLUMN_ID));
            String name =
cursor.getString(cursor.getColumnIndex(COLUMN_NAME));
            String address =
cursor.getString(cursor.getColumnIndex(COLUMN_ADDRESS));
            String phoneNumber =
cursor.getString(cursor.getColumnIndex(COLUMN_PHONE_NUMBER));
            customers.add(new Customer(id, name, address, phoneNumber));
        }

        cursor.close();
        return customers;
    }


}
```

Customer.java :

```
package com.example.slip1_2;
public class Customer {
    private  int  id;
    private String name;
    private String address;
    private String phoneNumber;

    public Customer(int id, String name, String address, String
phoneNumber) {
        this.id  =  id;
        this.name = name;
        this.address = address;
        this.phoneNumber = phoneNumber;
    }
    public int getId() {
        return id;
    }

    public String getName() {
        return name;
    }
    public String getAddress() {
```

```
        return address;
    }

    public String getPhoneNumber() {
        return phoneNumber;
    }
}
Activity.xml :
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
        android:theme="@style/Theme.Slip1_2"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

Q Create an Android Application that will change color of the screen and change the font size of text view using xml.

Activity.java :

```
package com.example.slip2_1;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.util.TypedValue;
import android.widget.*;

public class MainActivity extends AppCompatActivity {

    private RelativeLayout mainLayout;
    private TextView textView;

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

        mainLayout = findViewById(R.id.main_layout);
        textView = findViewById(R.id.textview);

        // Set background color of main layout

mainLayout.setBackgroundColor(getResources().getColor(R.color.colorPrimary
));

        // Set text size of text view
        textView.setTextSize(TypedValue.COMPLEX_UNIT_SP, 24);
    }
}
```

Activity.xml :

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

    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
        android:theme="@style/Theme.Slip2_1"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

Q. Create an Android Application to perform following string operation according to user selection of radio button.

Activity.java:

```
package com.example.slip3_2;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.*;

public class MainActivity extends AppCompatActivity {

    private EditText inputEditText;
    private RadioButton upperCaseRadioButton;
    private RadioButton lowerCaseRadioButton;
    private RadioButton rightFiveRadioButton;
    private RadioButton leftFiveRadioButton;
    private Button submitButton;

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

        inputEditText = findViewById(R.id.input_edit_text);
        upperCaseRadioButton = findViewById(R.id.upper_case_radio_button);
        lowerCaseRadioButton = findViewById(R.id.lower_case_radio_button);
        rightFiveRadioButton = findViewById(R.id.right_five_radio_button);
        leftFiveRadioButton = findViewById(R.id.left_five_radio_button);
        submitButton = findViewById(R.id.submit_button);

        submitButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
```

```
                String inputString = inputEditText.getText().toString();

                if (upperCaseRadioButton.isChecked()) {
                    Intent intent = new Intent(MainActivity.this,
ResultActivity.class);
                    intent.putExtra("result", inputString.toUpperCase());
                    intent.putExtra("operation", "uppercase");
                    startActivity(intent);
                } else if (lowerCaseRadioButton.isChecked()) {
                    Intent intent = new Intent(MainActivity.this,
ResultActivity.class);
                    intent.putExtra("result", inputString.toLowerCase());
                    intent.putExtra("operation", "lowercase");
                    startActivity(intent);
                } else if (rightFiveRadioButton.isChecked()) {
                    Intent intent = new Intent(MainActivity.this,
ResultActivity.class);
                    if (inputString.length() > 5) {
                        intent.putExtra("result",
inputString.substring(inputString.length() - 5));
                    } else {
                        intent.putExtra("result", inputString);
                    }
                    intent.putExtra("operation", "right5");
                    startActivity(intent);
                } else if (leftFiveRadioButton.isChecked()) {
                    Intent intent = new Intent(MainActivity.this,
ResultActivity.class);
                    if (inputString.length() > 5) {
                        intent.putExtra("result", inputString.substring(0,
5));
                    } else {
                        intent.putExtra("result", inputString);
                    }
                    intent.putExtra("operation", "left5");
                    startActivity(intent);
                }
            }
        });
```

```
    }
}
```

Activity.xml :

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

  <application
    android:allowBackup="true"
    android:dataExtractionRules="@xml/data_extraction_rules"
    android:fullBackupContent="@xml/backup_rules"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app_name"
    android:supportsRtl="true"
    android:theme="@style/Theme.Slip3_2"
    tools:targetApi="31">
    <activity
      android:name=".ResultActivity"
      android:exported="false" />
    <activity
      android:name=".MainActivity"
      android:exported="true">
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

QCreate a Simple Android Application Which Send —Helloll message from one activity to another with help of Button (Use Intent).

Activity.java :

```
package com.example.slip4_1;
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 helloButton;

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

        helloButton = findViewById(R.id.hello_button);

        helloButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Create an intent to start the ResultActivity
                Intent intent = new Intent(MainActivity.this,
ResultActivity.class);
                // Add the "Hello" message as an extra to the intent
                intent.putExtra("message", "Hello");
                // Start the ResultActivity
                startActivity(intent);
            }
        });
```

```
    }
}
```

Result.java :

```
package com.example.slip4_1;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.TextView;

public class ResultActivity extends AppCompatActivity {

    private TextView helloTextView;

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

        helloTextView = findViewById(R.id.hello_textview);

        // Get the "Hello" message from the intent's extras
        String message = getIntent().getStringExtra("message");

        // Set the "Hello" message in the text view
        helloTextView.setText(message);
    }
}
```

Activity.xml :

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

  <application
    android:allowBackup="true"
    android:dataExtractionRules="@xml/data_extraction_rules"
    android:fullBackupContent="@xml/backup_rules"
    android:icon="@mipmap/ic_launcher"
```

```
        android:label="@string/app_name"
        android:supportsRtl="true"
        android:theme="@style/Theme.Slip4_1"
        tools:targetApi="31">
        <activity
            android:name=".ResultActivity"
            android:exported="false" />
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

Q. Write an Android Program to Change the Image Displayed on the Screen

Activity.java :

```
package com.example.slip5_1;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.*;

public class MainActivity extends AppCompatActivity {

    private ImageView imageView;
    private Button changeButton;

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

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

        changeButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Change the image resource
                imageView.setImageResource(R.drawable.adv);
            }
        });
    }
}
```

Activity.xml :

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

```
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
        android:theme="@style/Theme.Slip5_1"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

Q.Write an Android code to complete the following Array/List operations 1. Union 2. Intersection

Activity.java :

```
package com.example.slip6_1;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.view.View;

import android.widget.*;

import java.util.ArrayList;

import java.util.HashSet;

public class MainActivity extends AppCompatActivity {

    private EditText list1EditText;

    private EditText list2EditText;

    private  EditText  ansEditText;

    private RadioButton unionRadioButton;

    private RadioButton intersectionRadioButton;

    private Button calculateButton;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);

        list1EditText = findViewById(R.id.list1_edittext);

        list2EditText = findViewById(R.id.list2_edittext);
```

```
        ansEditText = findViewById(R.id.result_edittext);

        unionRadioButton = findViewById(R.id.union_radiobutton);

        intersectionRadioButton =
findViewById(R.id.intersection_radiobutton);

        calculateButton = findViewById(R.id.calculate_button);

        calculateButton.setOnClickListener(new View.OnClickListener() {

            @Override

            public void onClick(View v) {

                String[] list1 =
list1EditText.getText().toString().split(",");

                String[] list2 =
list2EditText.getText().toString().split(",");

                HashSet<String> set1 = new HashSet<>();

                HashSet<String> set2 = new HashSet<>();

                ArrayList<String> ansList = new ArrayList<>();

                for (String s : list1) {

                    set1.add(s);

                }

                for (String s : list2) {

                    set2.add(s);

                }

                if (unionRadioButton.isChecked()) {

                    ansList.addAll(set1);

                    ansList.addAll(set2);

                } else if (intersectionRadioButton.isChecked()) {

                    for (String s : set1) {

                        if (set2.contains(s)) {

                            ansList.add(s);
```

```
                        }
                    }
                }
                StringBuilder ansBuilder = new StringBuilder();
                for (String s : ansList) {
                    ansBuilder.append(s).append(",");
                }
                if (ansBuilder.length() > 0) {
                    ansBuilder.deleteCharAt(ansBuilder.length() - 1);
                }
                ansEditText.setText(ansBuilder.toString());
            }
        });
    }
}
```

Activity.xml :

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
        android:theme="@style/Theme.Slip6_1"
```

```
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER"
/>
            </intent-filter>
        </activity>
    </application>
</manifest>
```

Q.Write an Android program to read 5 numbers and print the sum of all

Activity.java :

```
package com.example.slip8_1;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.Toast;
import java.util.Arrays;
import java.util.List;
public class MainActivity extends AppCompatActivity {
    EditText input, result;
    RadioButton sumButton, avgButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        input = findViewById(R.id.input);
        result = findViewById(R.id.result);
        sumButton = findViewById(R.id.sumButton);
        avgButton = findViewById(R.id.avgButton);
    }
    public void calculate(View view) {
        String[] numList = input.getText().toString().split(",");
        List<String> numStringList = Arrays.asList(numList);

        if (numStringList.size() != 5) {
            Toast.makeText(getApplicationContext(), "Please enter 5
comma-separated numbers", Toast.LENGTH_SHORT).show();
```

```
            return;
        }
        int n1, n2, n3, n4, n5;
        int total = 0;
        double average;
        try {
            n1 = Integer.parseInt(numStringList.get(0));
            n2 = Integer.parseInt(numStringList.get(1));
            n3 = Integer.parseInt(numStringList.get(2));
            n4 = Integer.parseInt(numStringList.get(3));
            n5 = Integer.parseInt(numStringList.get(4));
            if (sumButton.isChecked()) {
                total = n1 + n2 + n3 + n4 + n5;
                result.setText(String.valueOf(total));
            } else if (avgButton.isChecked()) {
                average = (double) (n1 + n2 + n3 + n4 + n5) / 5;
                result.setText(String.format("%.2f", average));
            }
        } catch (NumberFormatException e) {
            Toast.makeText(getApplicationContext(), "Please enter 5
comma-separated integers", Toast.LENGTH_SHORT).show();
        }
    }
}
```

Activity.xml :

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
        android:theme="@style/Theme.Slip8_1"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
```

```
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

(B)Create a Notification in Android and display the notification message on second activity

Activity.java :

```
package com.example.slip8_2;
import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.os.Build;
import android.os.Bundle;
import android.view.View;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import  androidx.core.app.NotificationCompat;
import androidx.core.app.NotificationManagerCompat;

public class MainActivity extends AppCompatActivity {
    private static final String CHANNEL_ID = "my_channel";
    int notificationId = 1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        createNotificationChannel();
    }
    public void sendNotification(View view) {
        Intent intent = new Intent(this, SecondActivity.class);
        PendingIntent pendingIntent = PendingIntent.getActivity(
```

```
                this, 0, intent,
                PendingIntent.FLAG_IMMUTABLE |
PendingIntent.FLAG_UPDATE_CURRENT);
        NotificationCompat.Builder builder = new
NotificationCompat.Builder(this, CHANNEL_ID)
                .setSmallIcon(R.drawable.ic_launcher_foreground)
                .setContentTitle("My Notification")
                .setContentText("This is my notification.")
                .setContentIntent(pendingIntent)
                .setAutoCancel(true)
                .setPriority(NotificationCompat.PRIORITY_DEFAULT);
        NotificationManagerCompat notificationManager =
NotificationManagerCompat.from(this);
        if (ActivityCompat.checkSelfPermission(this,
android.Manifest.permission.POST_NOTIFICATIONS) !=
PackageManager.PERMISSION_GRANTED) {
            return;
        }
        notificationManager.notify(notificationId, builder.build());
    }
    private void createNotificationChannel() {
        if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
            CharSequence name = getString(R.string.channel_name);
            String description = getString(R.string.channel_description);
            int importance = NotificationManager.IMPORTANCE_DEFAULT;
            NotificationChannel channel = new
NotificationChannel(CHANNEL_ID, name, importance);
            channel.setDescription(description);
            NotificationManager notificationManager =
getSystemService(NotificationManager.class);
            notificationManager.createNotificationChannel(channel);
        }
    }
}
```

SecondActivity.java :

```
package com.example.slip8_2;
import android.content.Intent;
import android.os.Bundle;
import android.widget.TextView;
```

```
import  androidx.appcompat.app.AppCompatActivity;
public class SecondActivity extends AppCompatActivity {
    TextView messageTextView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_second);
        messageTextView = findViewById(R.id.messageTextView);
        Intent intent = getIntent();
        String message = intent.getStringExtra("notificationMessage");
        messageTextView.setText(message);
    }
}
```

Activity.xml :

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

    <uses-permission android:name="android.permission.POST_NOTIFICATIONS"
/>
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
        android:theme="@style/Theme.Slip8_2"
        tools:targetApi="31">
        <activity
            android:name=".SecondActivity"
            android:exported="false" />
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER"
/>
```

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

Q. Construct an Android Application to display the images using ImageSwitcher

Activity.java :

```
package com.example.slip10_2;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.ImageSwitcher;
import android.widget.ImageView;
import android.widget.ViewSwitcher;
public class MainActivity extends AppCompatActivity {
    private ImageSwitcher imageSwitcher;
    private Button nextButton, prevButton;
    private int[] imageIds = {R.drawable.deep, R.drawable.index,
R.drawable.nidhi};
    private int currentPosition = 0;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        imageSwitcher = findViewById(R.id.imageSwitcher);
        nextButton = findViewById(R.id.nextButton);
        prevButton = findViewById(R.id.prevButton);
        imageSwitcher.setFactory(new ViewSwitcher.ViewFactory() {
            @Override
            public View makeView() {
                ImageView imageView = new
ImageView(getApplicationContext());
                imageView.setScaleType(ImageView.ScaleType.CENTER_CROP);
                return imageView;
            }
        });
        imageSwitcher.setImageResource(imageIds[currentPosition]);
```

```
        nextButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                if (currentPosition < imageIds.length - 1) {
                    currentPosition++;
                } else {
                    currentPosition = 0;
                }
                imageSwitcher.setImageResource(imageIds[currentPosition]);
            }
        });
        prevButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                if (currentPosition > 0) {
                    currentPosition--;
                } else {
                    currentPosition = imageIds.length - 1;
                }
                imageSwitcher.setImageResource(imageIds[currentPosition]);
            }
        });
    }
}
```

Activity.xml :

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
        android:theme="@style/Theme.Slip10_2"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
```

```
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

Q. Construct an Android Application to accept a number and calculate Factorial and Sum of Digits of a given number using Menu.

Activity.java :

```
package com.example.slip11_1;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuItem;
import android.widget.EditText;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
    private EditText numberEditText;
    private TextView resultTextView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        numberEditText = findViewById(R.id.numberEditText);
        resultTextView = findViewById(R.id.resultTextView);
    }
    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        getMenuInflater().inflate(R.menu.main_menu, menu);
        return true;
    }
    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        switch (item.getItemId()) {
            case R.id.calculateFactorial:
                calculateFactorial();
                return true;
            case R.id.calculateSum:
                calculateSumOfDigits();
```

```
                return true;
            default:
                return super.onOptionsItemSelected(item);
        }
    }
    private void calculateFactorial() {
        try {
            int number =
Integer.parseInt(numberEditText.getText().toString());
            int factorial = 1;
            for (int i = 1; i <= number; i++) {
                factorial *= i;
            }
            resultTextView.setText("Factorial of " + number + " is " +
factorial);
        } catch (NumberFormatException e) {
            resultTextView.setText("Please enter a valid number");
        }
    }
    private void calculateSumOfDigits() {
        try {
            int number =
Integer.parseInt(numberEditText.getText().toString());
            int sum = 0;
            while (number != 0) {
                sum += number % 10;
                number /= 10;
            }
            resultTextView.setText("Sum of digits of " + number + " is " +
sum);
        } catch (NumberFormatException e) {
            resultTextView.setText("Please enter a valid number");
        }
    }
}
```

Activity.xml :

<?xml version="1.0" encoding="utf-8"?>

<manifest xmlns:android="http://schemas.android.com/apk/res/android"

```
    xmlns:tools="http://schemas.android.com/tools">
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
        android:theme="@style/Theme.Slip11_1"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category  android:name="android.intent.category.LAUNCHER"  />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

Q. Write an Android Application to send Email.

Activity.java :

```
package com.example.slip15_2;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.content.Intent;

import  android.net.Uri;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    private EditText recipientEditText;

    private EditText subjectEditText;

    private EditText messageEditText;

    private Button sendButton;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);

        recipientEditText = findViewById(R.id.recipientEditText);

        subjectEditText = findViewById(R.id.subjectEditText);

        messageEditText = findViewById(R.id.messageEditText);
```

```
        sendButton = findViewById(R.id.sendButton);

        sendButton.setOnClickListener(new View.OnClickListener() {

            @Override

            public void onClick(View view) {

                String recipient =
recipientEditText.getText().toString().trim();

                String subject =
subjectEditText.getText().toString().trim();

                String message =
messageEditText.getText().toString().trim();

                if (recipient.isEmpty()) {

                    Toast.makeText(MainActivity.this, "Please enter a
recipient email address", Toast.LENGTH_SHORT).show();

                } else {

                    Intent intent = new Intent(Intent.ACTION_SENDTO);

                    intent.setData(Uri.parse("mailto:"));

                    intent.putExtra(Intent.EXTRA_EMAIL, new
String[]{recipient});

                    intent.putExtra(Intent.EXTRA_SUBJECT, subject);

                    intent.putExtra(Intent.EXTRA_TEXT, message);

                    if (intent.resolveActivity(getPackageManager()) !=
null) {

                        startActivity(intent);

                    } else {

                        Toast.makeText(MainActivity.this, "No email app
installed", Toast.LENGTH_SHORT).show();

                    }

                }

            }
```

```
        });
    }
}
```

Activity.xml :

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
        android:theme="@style/Theme.Slip15_2"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER"
/>
            </intent-filter>
        </activity>
    </application>
</manifest>
```