**QUESTION 01:**

**Directory Structure:**

1. **Default Resource Directory Structure:**
   * **/res/values/dimens.xml**
2. **Alternative Resource Directory Structure (for screens with a long dimension):**
   * **/res/values-long/dimens.xml**

### QUESTION 02:

### Layout XML (activity\_main.xml):

<GridLayout

android:id="@+id/gridLayout"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:columnCount="3"

android:rowCount="3"

android:padding="16dp"

android:background="@android:color/white">

<!-- Cell 1 -->

<TextView

android:id="@+id/cell\_1"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text=""

android:textSize="24sp"

android:gravity="center"

android:background="@drawable/cell\_background"/>

<!-- Cell 2 -->

<TextView

android:id="@+id/cell\_2"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text=""

android:textSize="24sp"

android:gravity="center"

android:background="@drawable/cell\_background"/>

<!-- Repeat for Cell 3 to Cell 9 -->

</GridLayout>

### Drawable (cell\_background.xml):

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

android:shape="rectangle">

<solid android:color="@android:color/white"/>

<stroke android:color="@android:color/black" android:width="1dp"/>

</shape>

### Java Code (MainActivity.java):

public class MainActivity extends AppCompatActivity {

private TextView[][] cells = new TextView[3][3];

private int[][] numbers = new int[3][3];

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

GridLayout gridLayout = findViewById(R.id.gridLayout);

// Initialize the cells array

for (int i = 0; i < 3; i++) {

for (int j = 0; j < 3; j++) {

int cellId = getResources().getIdentifier("cell\_" + (i \* 3 + j + 1), "id", getPackageName());

cells[i][j] = findViewById(cellId);

}

}

// Generate random numbers and display them in cells

generateRandomNumbers();

updateGrid();

// Check for adjacent column duplicates and highlight cells

highlightCells();

}

private void generateRandomNumbers() {

Random random = new Random();

for (int i = 0; i < 3; i++) {

for (int j = 0; j < 3; j++) {

numbers[i][j] = random.nextInt(10); // Generate random number between 0 and 9

}

}

}

private void updateGrid() {

for (int i = 0; i < 3; i++) {

for (int j = 0; j < 3; j++) {

cells[i][j].setText(String.valueOf(numbers[i][j]));

}

}

}

private void highlightCells() {

for (int i = 0; i < 3; i++) {

for (int j = 0; j < 3; j++) {

if (j < 2 && numbers[i][j] == numbers[i][j + 1]) {

cells[i][j].setBackgroundResource(R.drawable.cell\_highlight);

cells[i][j + 1].setBackgroundResource(R.drawable.cell\_highlight);

}

}

}

}

}

### Drawable (cell\_highlight.xml):

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

android:shape="rectangle">

<solid android:color="@android:color/holo\_blue\_light"/>

<stroke android:color="@android:color/black" android:width="1dp"/>

</shape>

### Question 03:

### Java Code (MainActivity.java):

public class MainActivity extends AppCompatActivity {

private EditText urlEditText;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

urlEditText = findViewById(R.id.urlEditText);

Button openButton = findViewById(R.id.openButton);

openButton.setOnClickListener(new View.OnClickListener() {

@Override

public void onClick(View v) {

String url = urlEditText.getText().toString().trim();

if (isValidUrl(url)) {

openBrowser(url);

} else {

Toast.makeText(MainActivity.this, "Invalid URL", Toast.LENGTH\_SHORT).show();

}

}

});

}

private boolean isValidUrl(String url) {

// Simple URL validation

return Patterns.WEB\_URL.matcher(url).matches();

}

private void openBrowser(String url) {

Intent intent = new Intent(Intent.ACTION\_VIEW);

intent.setData(Uri.parse(url));

startActivity(intent);

}

}

### Layout XML (activity\_main.xml):

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

xmlns:tools="http://schemas.android.com/tools"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

tools:context=".MainActivity">

<EditText

android:id="@+id/urlEditText"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Enter URL"

android:inputType="textUri" />

<Button

android:id="@+id/openButton"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_below="@id/urlEditText"

android:layout\_centerHorizontal="true"

android:layout\_marginTop="16dp"

android:text="Open Website" />

</RelativeLayout>

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