EXPERIMENT - 3

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Branch: CSE **Section/Group: 603/A**

Semester: 6th semester **Subject: MAD Lab**

1. **Aim/Overview of the practical:** Create Application by Using Widgets.

2. **Apparatus / Simulator Used:**
   1. Linux OS/ Windows 7 or above
   2. Android Studio
   3. Ram 4 GB and above
   4. Java (Including JDK & JRE)

3. **Objective:**
   a. To understand the concept of widgets.
   b. To implement the Widgets in Android Studio.

4. **Steps:**

Step 1: Create a New Project

To create a new project in Android Studio please refer to How to Create/Start a New Project in Android Studio. We are implementing it for both Java and Kotlin languages.

Step 2: Add the App Widget to the Project

Right-Click on the app, move the cursor to new, find the “Widget” option at the end, select it.

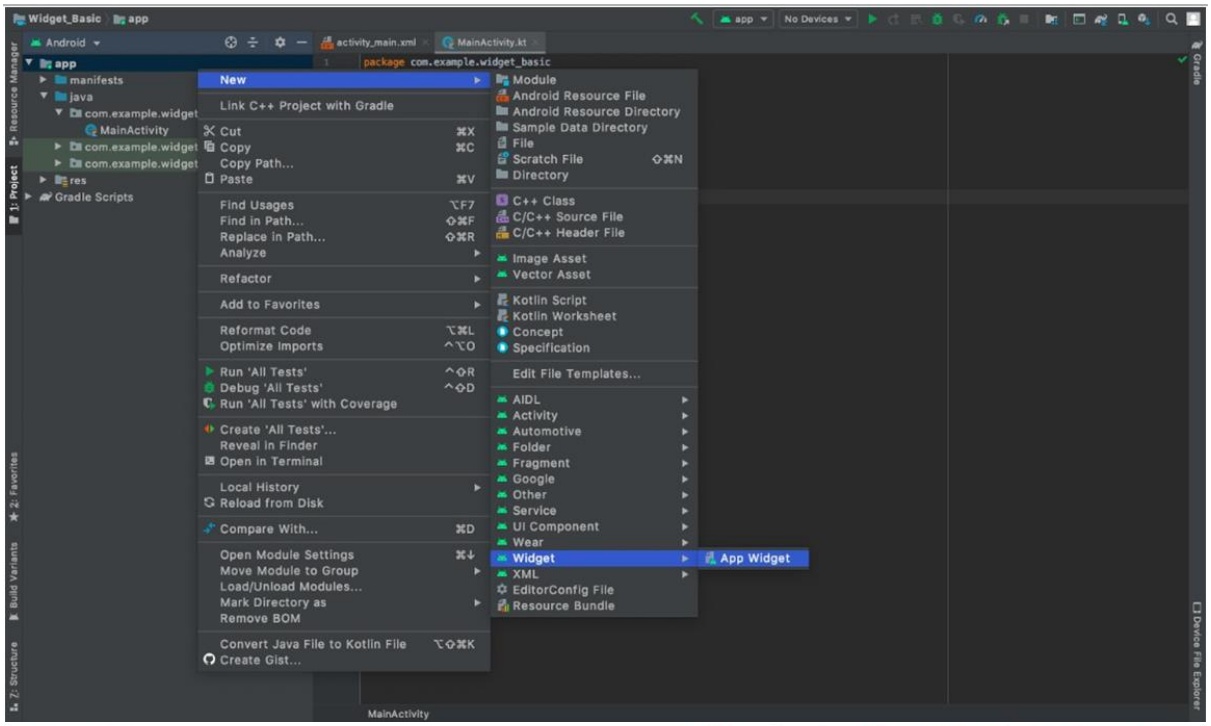
Specify the required properties for the widget such as min. width and height, config file and preferred language, etc, and proceed. Files are automatically generated.

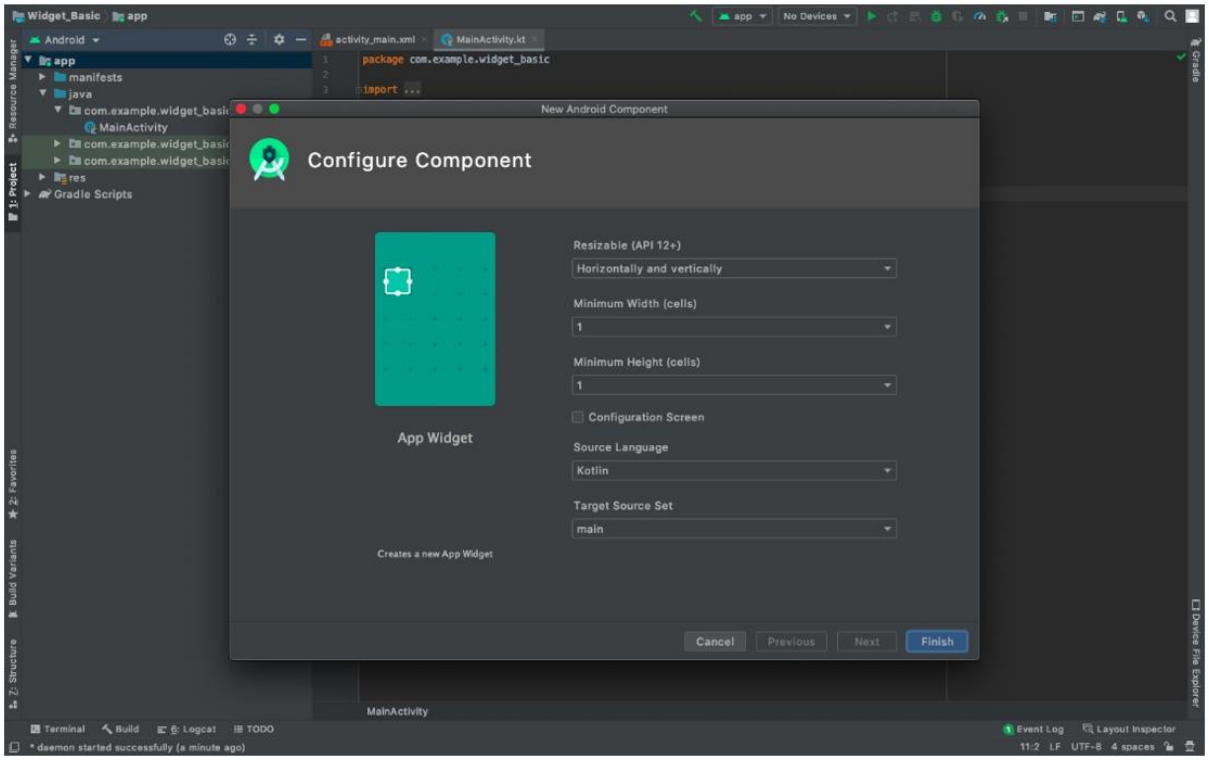
Step 3: Install and Run the Code

1. Install and Run the code on Android Virtual Device (AVD) or a personal device.
2. Open the widget section of the phone, lookup for a widget with the Application name, select it, bring it to the home screen.
3. Try changing the dimensions and we are done!

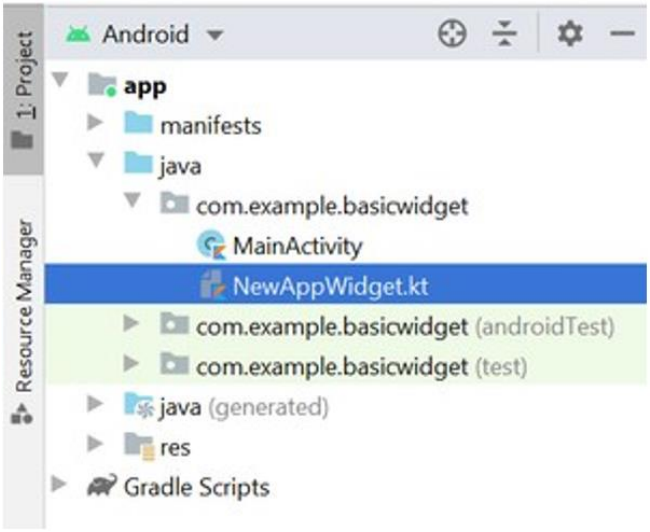
During this selecting and deploying process, a few extra files are generated and minor changes

are made to existing files as well. No programming is required for generating a basic widget and is only required if an application is to be embedded inside the widget, as discussed in the later parts of the article. Let us now explain the newly generated files the changes make to the existing ones, one by one.



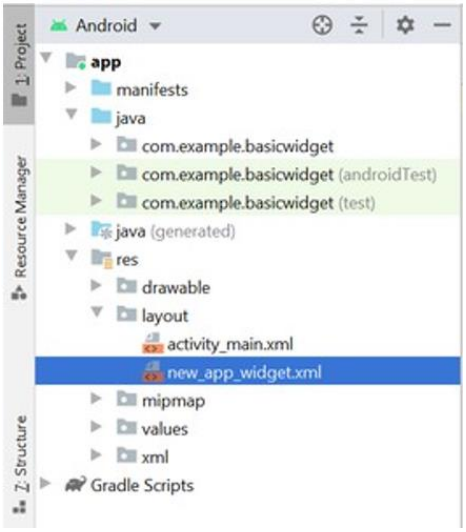


A. NewAppWidget.kt



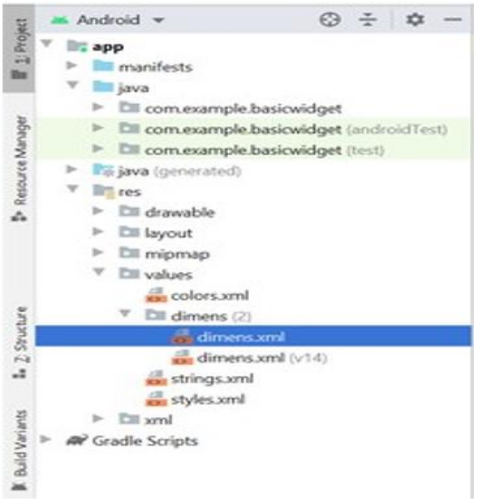

```
import android.appwidget.AppWidgetManager; import android.appwidget.AppWidgetProvider;
import android.content.Context;
import android.widget.RemoteViews;
class NewAppWidget extends AppWidgetProvider { @Override
public void onUpdate(Context context, AppWidgetManager appWidgetManager, int[]
appWidgetIds){ for (int appWidgetId : appWidgetIds) {updateAppWidget(context,
appWidgetManager,
appWidgetId);
}
}
@Override public void onEnabled(Context context){ super.onEnabled(context);
}
@Override public void onDisabled(Context context){ super.onDisabled(context);
}private void
updateAppWidget(Context context, AppWidgetManager appWidgetManager, int appWidgetId)
{
String widgetText = context.getString(R.string.appwidget_text); RemoteViews views = new
RemoteViews(context.getPackageName(),
R.layout.new_app_widget);
views.setTextViewText(R.id.appwidget_text, widgetText);
appWidgetManager.updateAppWidget(appWidgetId, views);

}}
```

B. new_app_widget.xml



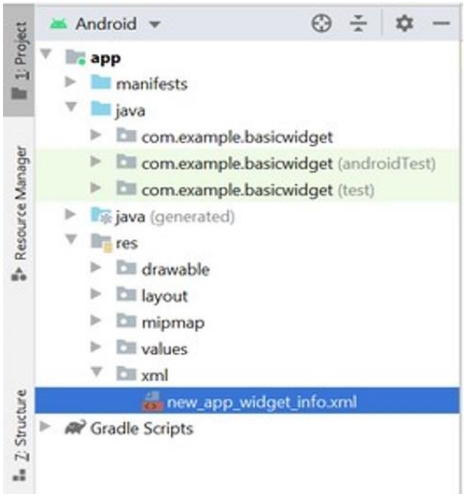

```
<RelativeLayout
        xmlns:android="http://schemas.android.com/
        apk/res/android"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:background="#09C"
        android:padding="@dimen/widget_margin">
<TextView
android:id="@+id/appwidget_text" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:layout_centerHorizontal="true"
android:layout_centerVertical="true" android:layout_margin="8dp"
android:background="#09C" android:contentDescription="@string/appwidget_text"
android:text="@string/appwidget_text" android:textColor="#ffffff"
android:textSize="24sp" android:textStyle="bold|italic" />
</RelativeLayout>
```

C. dimens.xml



```
<?xml version="1.0" encoding="utf-8"?>
<resources>
<dimen name="widget_margin">8dp</dimen>
</resources>
```

D. new_app_widget_info.xml

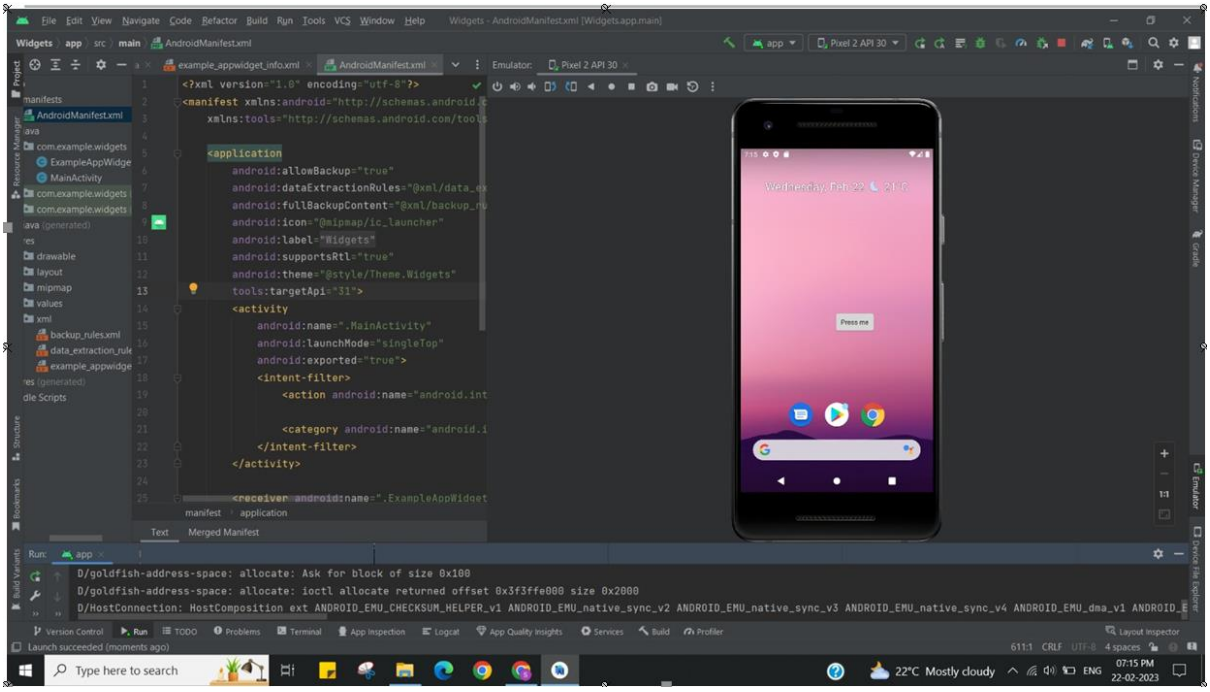


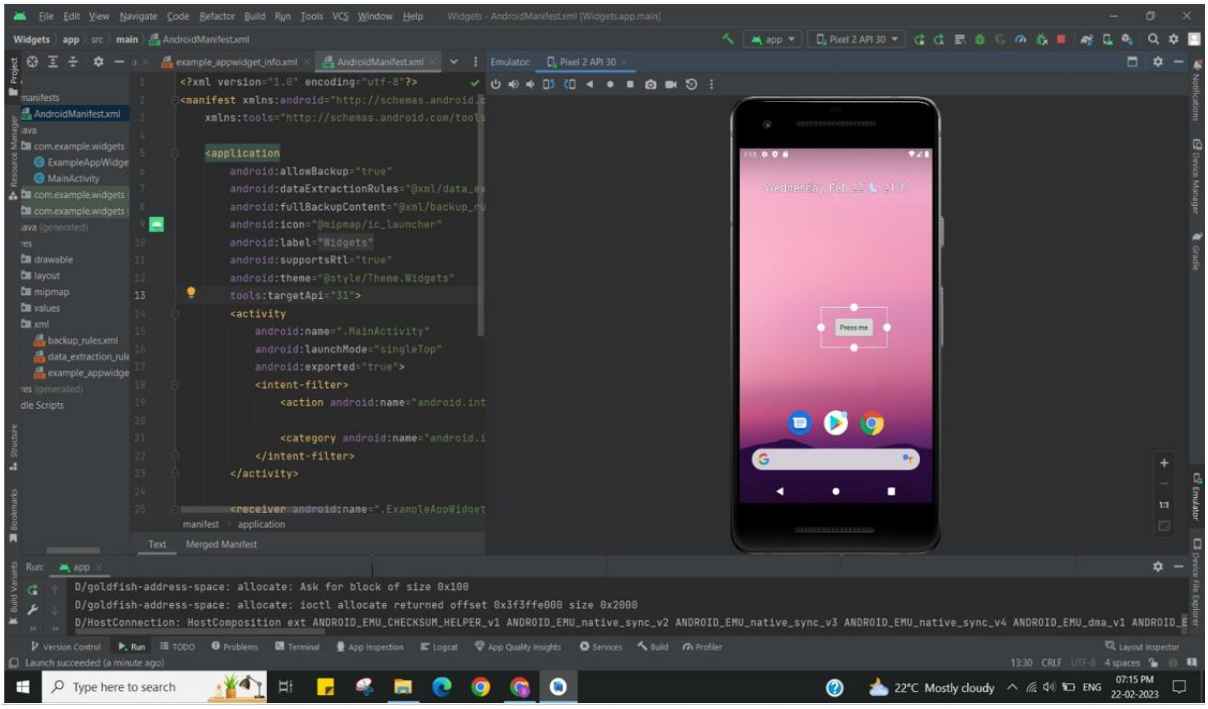

```
<?xml version="1.0" encoding="utf-8"?>
<appwidget-provider
xmlns:android="http://schemas.android.com/apk/res/android"
android:initialKeyguardLayout="@layout/new_app_widget"
android:initialLayout="@layout/new_app_widget" android:minWidth="40dp"
android:minHeight="40dp" android:previewImage="@drawable/example_appwidget_preview"
android:resizeMode="horizontal|vertical" android:updatePeriodMillis="86400000"
android:widgetCategory="home_screen">
</appwidget-provider>
```

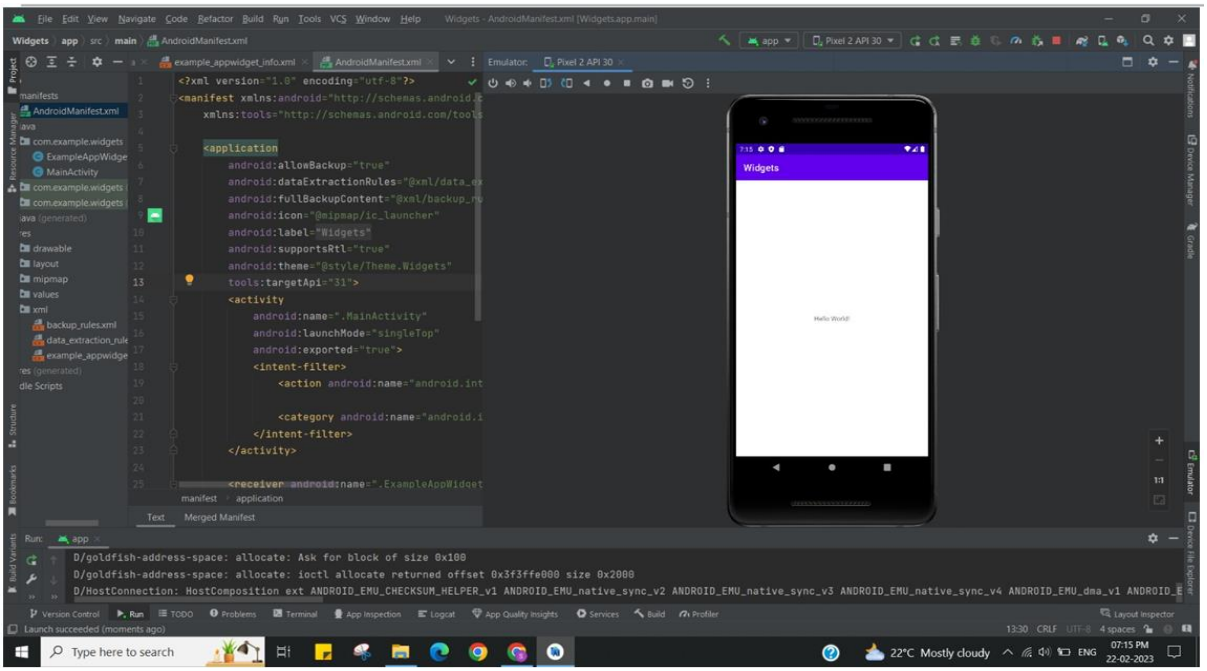
E. Changes made to AndroidManifest.xml file

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
package="org.geeksforgeeks.widget_basic">
<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">
<receiver android:name=".NewAppWidget">
<intent-filter>
<action android:name="android.appwidget.action.APPWIDGET_UPDATE" />
</intent-filter>
<meta-data
```

```
android:name="android.appwidget.provider" android:resource="@xml/new_app_widget_info"
/>
</receiver>
<!-- ----------------------------Until Here  >
<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>
```







Learning outcomes (What I have learnt):

- Learned the concept of Widgets in Android Studio
- Learnt about the Functionality of widgets.

Evaluation Grid (To be created per the faculty's SOP and Assessment guidelines):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Worksheet completion including writinglearning objectives/Outcomes. (To be submitted at the end of theday).		
2.	Post-Lab Quiz Result.		
3.	Student Engagement in Simulation/Demonstration/Performance andControls/Pre-Lab Questions.		
	Signature of Faculty (with Date):	Total Marks Obtained :	