Experiment1.3

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Subject Name: Mobile App Development **Subject Code: 21CSH-355**

1. **Aim:** Create an Android-based application using widgets. It can be embedded in other applications (such as the home screen) and receive periodic updates.

2. **Objective:** The objective is to develop an Android application featuring customizable widgets that can be embedded in diverse applications, including the home screen. The application should seamlessly receive periodic updates, ensuring real-time information and enhanced user interaction.

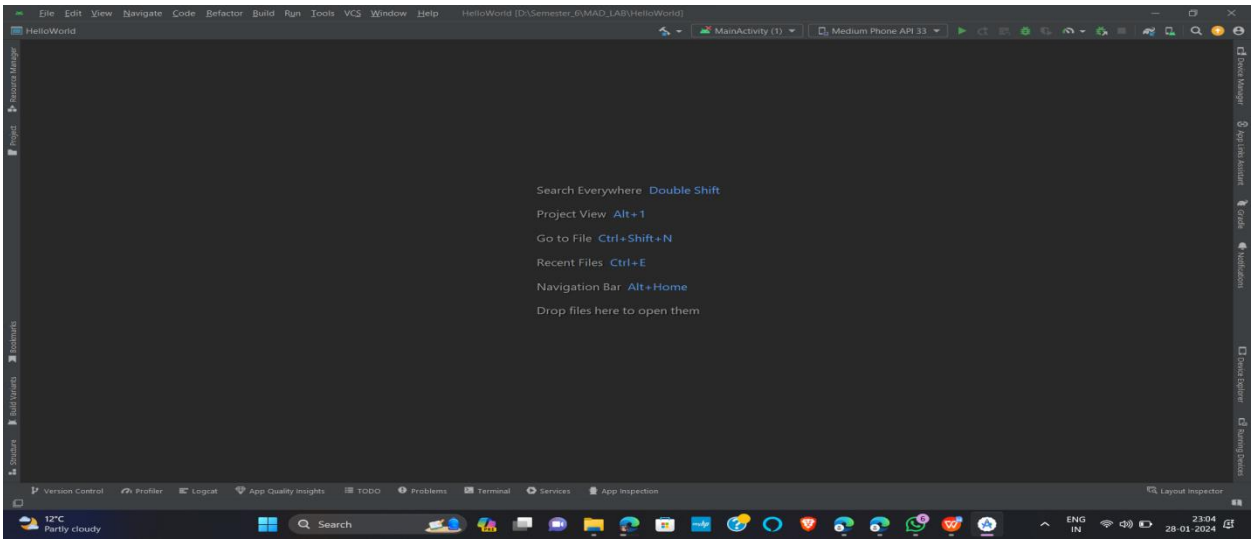
3. Input/Apparatus Used:

- **Computer:** Android Studio is compatible with Windows, macOS, and Linux. Ensure that your computer meets the minimum system requirements for the chosen operating system.
- **Internet Connection:** A reliable internet connection is required to download Android Studio and the necessary SDK components during the installation process.
- **Android Studio Installer:** Download the Android Studio installer from the official Android Studio Page **(https://developer.android.com/studio).** Choose the appropriate version for your operating system.
- **Storage Space:** Ensure sufficient free storage space on your computer to accommodate the Android Studio installation and any additional SDK components you may download.

4. Procedure:

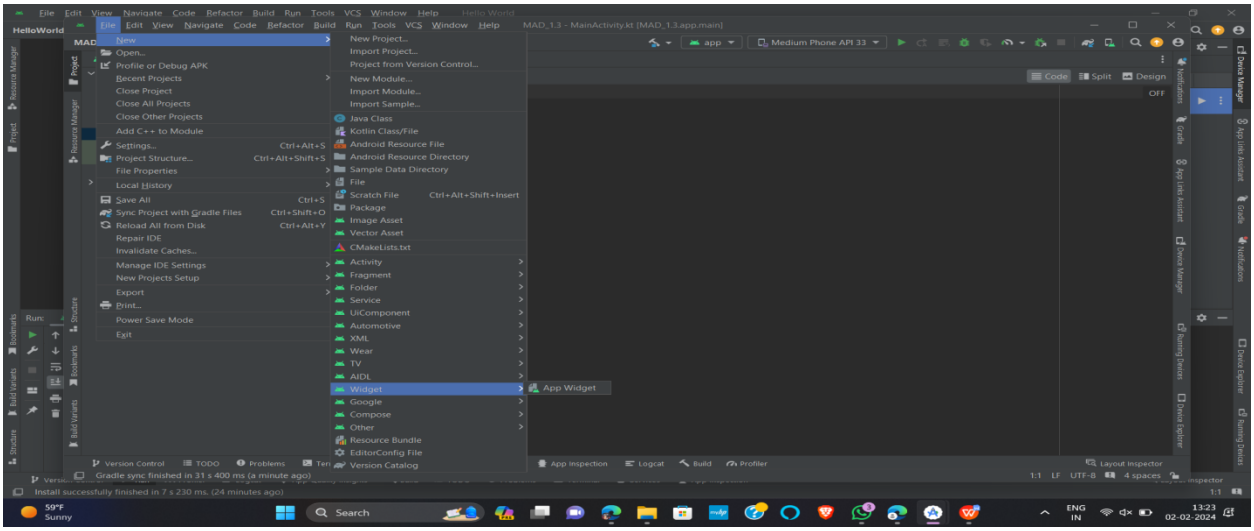
Step 1: Create a New Project

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.

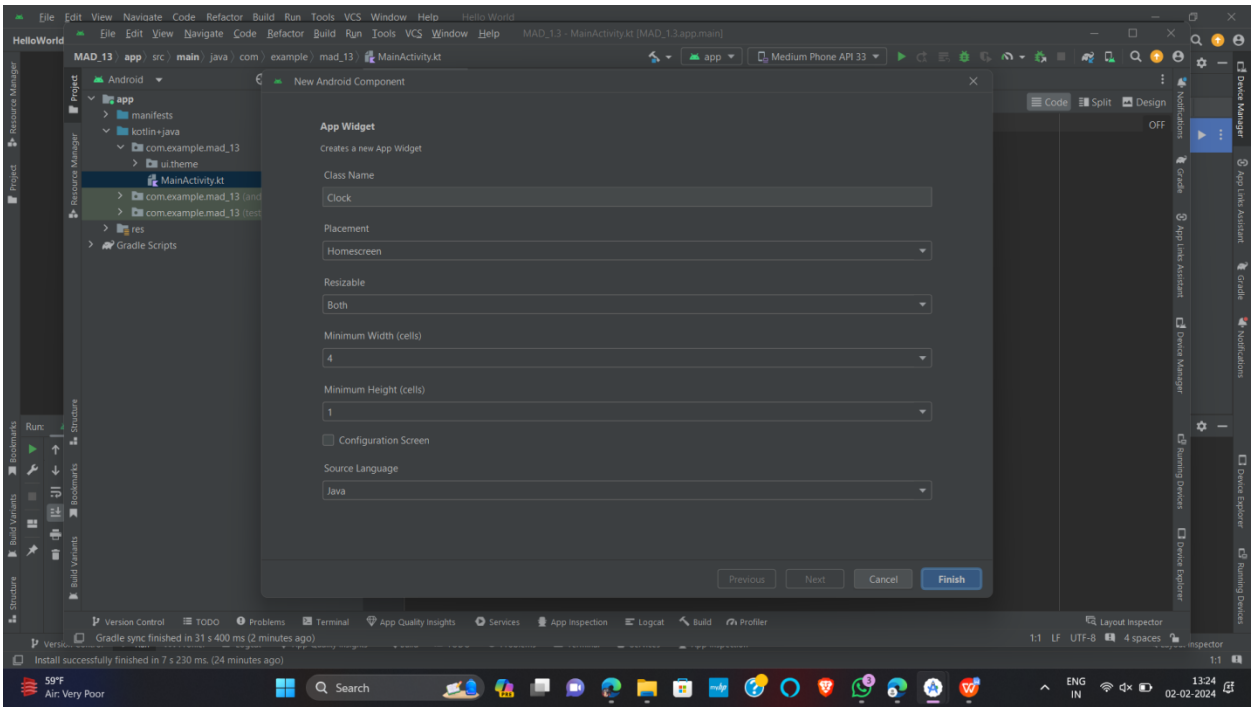


Step 2: Add the App Widget to the Project

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.



SOURCE CODE:

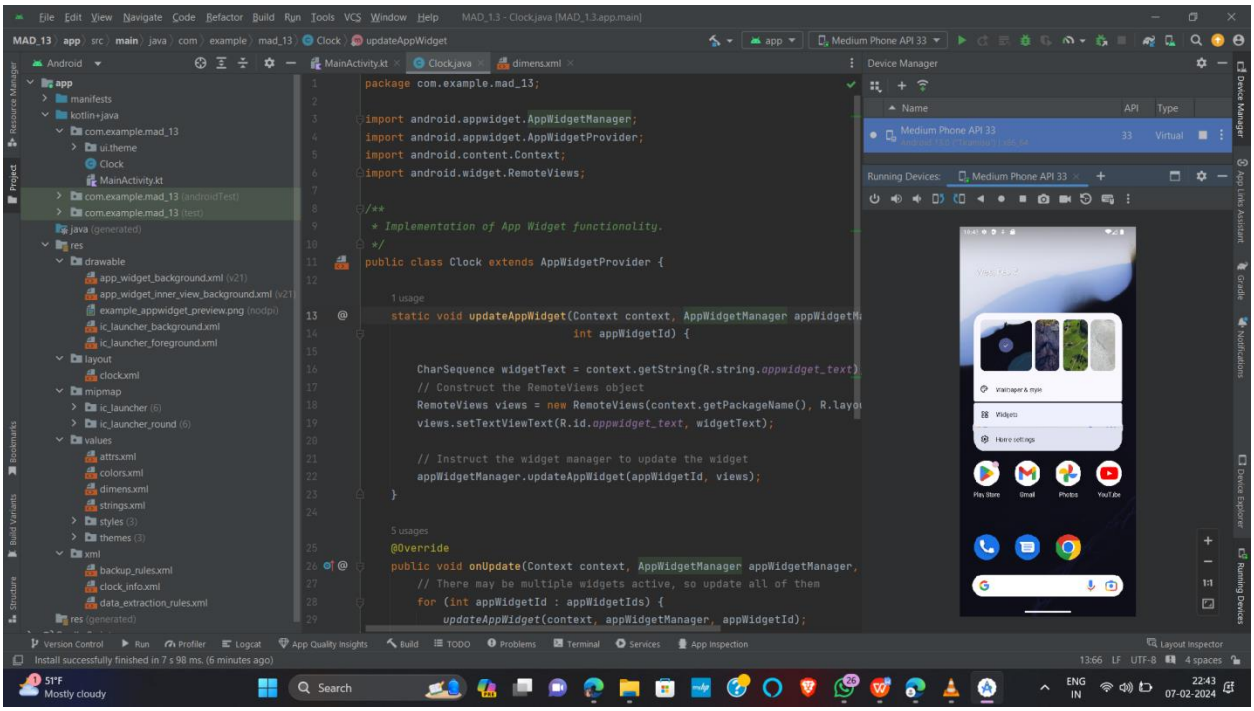
```
package com.example.mad_13;

import android.appwidget.AppWidgetManager;
import android.appwidget.AppWidgetProvider;
import android.content.Context;
import android.widget.RemoteViews;

/**
* Implementation of App Widget functionality.
*/
public class Clock extends AppWidgetProvider {

    static void updateAppWidget(Context context, AppWidgetManager appWidgetManager,
                                int appWidgetId) {

        CharSequence widgetText = context.getString(R.string.appwidget_text);
        // Construct the RemoteViews object
        RemoteViews views = new RemoteViews(context.getPackageName(), R.layout.clock);
```

```
        views.setTextViewText(R.id.appwidget_text, widgetText);

        // Instruct the widget manager to update the widget
        appWidgetManager.updateAppWidget(appWidgetId, views);
    }

    @Override
    public void onUpdate(Context context, AppWidgetManager appWidgetManager, int[]
appWidgetIds) {
        // There may be multiple widgets active, so update all of them
        for (int appWidgetId : appWidgetIds) {
updateAppWidget(context, appWidgetManager, appWidgetId);
        }
    }

    @Override
    public void onEnabled(Context context) {
        // Enter relevant functionality for when the first widget is created
    }

    @Override
    public void onDisabled(Context context) {
        // Enter relevant functionality for when the last widget is disabled
    }
}
```

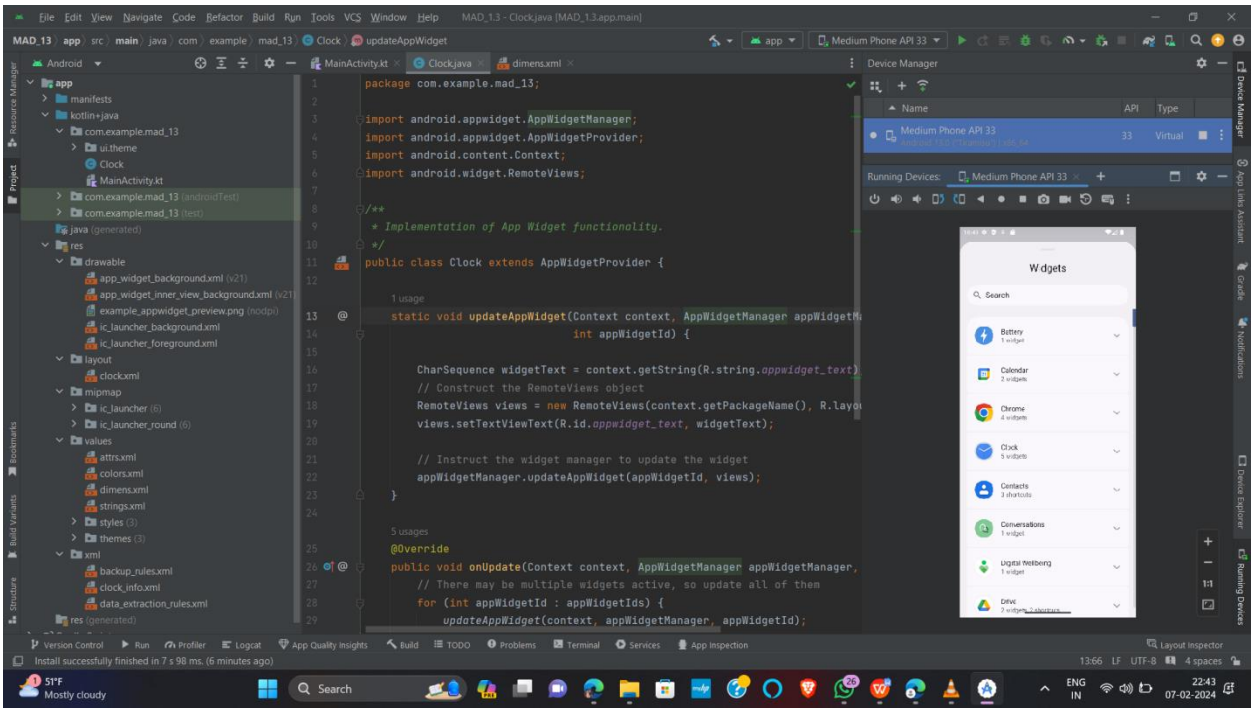
Step 3: Running appon Emulator(AVD)

1. To run the app from Android studio, open one of your project's activity files and click Runicon from the toolbar. Android studio installs the app on your AVD and starts it and if everything is fine with the set-up and application, it will display Emulator window in the device manager.

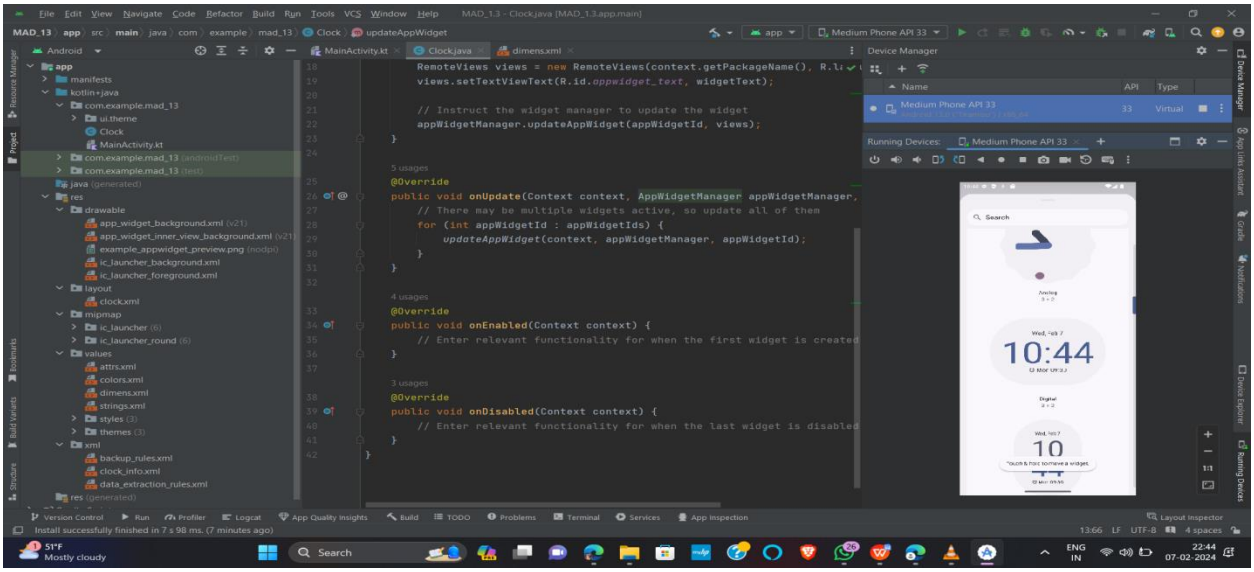
2. Long press on the emulator screen to open a menu.



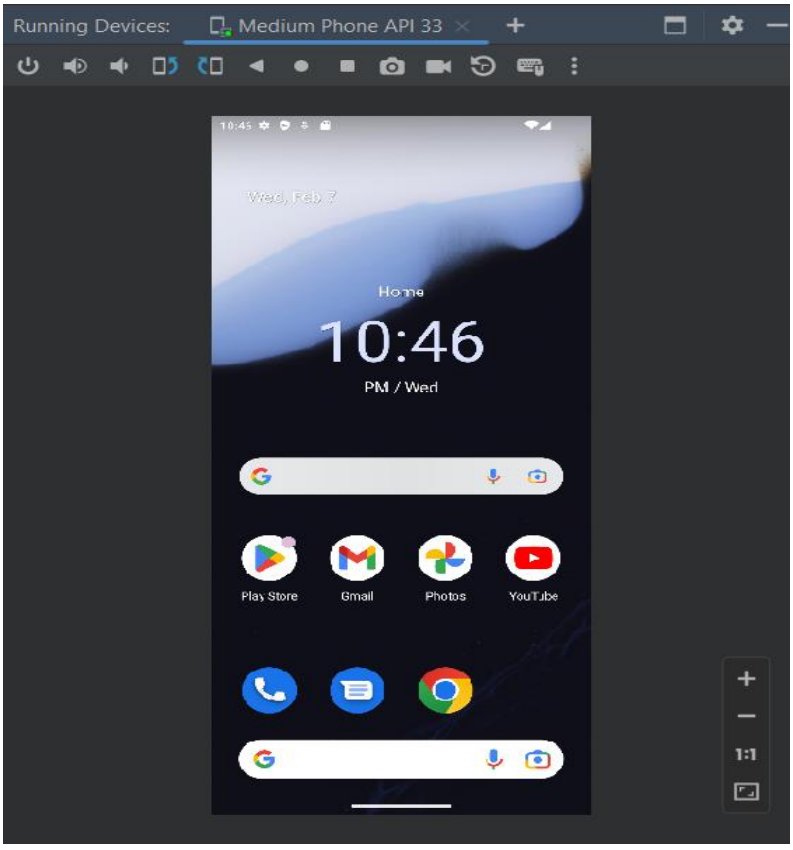
3. Now click on the widget and select the widget you want to add on the homescreen of the emulator.



4. Now we can select the theme of the widget.



5. Now drag the widget to the home screen and now we can see the widget on the home screen.



5. Learning Outcomes:

1. I have learned the process of installing Android Studio, a tool for Android app development.
2. I understand the importance of configuring SDKs and virtual devices for a smooth development environment.
3. I now understand the significance of testing applications on a virtual device, ensuring a well-prepared development setup.