FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING

Department of Computer Engineering

Class **T.E. Computer A**
Subject Name **Mobile Computing**

Practical No.	10
Title	To develop an android application that creates an alert upon receiving a message.
Date of Performance	21/04/2025
Date of Submission	27/04/2025
Roll No.	9913
Name	Mark Lopes

Evaluation:

Sr. No	Rubric	Grade
1	**Timeline(2)**	
2	**Output(3)**	
3	**Code Optimization(3)**	
4	**Knowledge of the topic(2)**	
5	**Total(10)**	

Signature of the teacher:

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Experiment No.: 10

1. Aim: To develop an android application that creates an alert upon receiving a message.

2. Objectives: To introduce students with various tools like Android Studio, NS2, Wire- shark, Cisco packet tracer, WAP supported browseretc.

3. Outcomes:
After successful completion of this experiment students will be able to develop an android application that creates an alert upon receiving a message

A.4Theory:

SOFTWARE:
• AndroidStudio
• The Android SDK (StarterPackage)
• Gradle
• Java Development Kit (JDK)5
DESCRIPTION:

• Open android studio and select new android project.
• Give project name and selectnext
• Choose the androidversion.
• Enter the package name. package name must be two word separated by comma and clickfinish
• Go to package explorer in the left hand side and select ourproject.
• Go to res folder and select layout. Double click the main.xmlfile •
Now you can see the Graphics layoutwindow.

INPUT:

MAINACTIVITY.JAVA

```
package com.alert;

import androidx.appcompat.app.AppCompatActivity; import
android.os.Bundle; import android.app.Notification;
import android.app.NotificationManager; import android.app.PendingIntent; import
android.content.Intent;
import android.view.View; import android.widget.Button; import android.widget.EditText;

public class MainActivity extends
AppCompatActivity{ Button notify; EditTexte;
```

```
@Override
protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
notify= (Button) findViewById(R.id.button); e= (EditText) findViewById(R.id.editText);

notify.setOnClickListener(new View.OnClickListener()
{ @Override public void onClick(View v) {
Intent intent = new Intent(MainActivity.this, SecondActivity.class);
PendingIntent pending = PendingIntent.getActivity(MainActivity.this, 0, intent, 0);
Notification noti = new Notification.Builder(MainActivity.this).setContentTitle("New
Message").setContentText(e.getText().toString()).setSmallIcon(R.mipmap.ic_l
auncher).setContentIntent(pending).build();
NotificationManager manager = (NotificationManager)
getSystemService(NOTIFICATION_SERVICE);
noti.flags |= Notification.FLAG_AUTO_CANCEL; manager.notify(0, noti);
}
});
}
}
```

ACTIVITY_MAIN.XML

```
<?xml version="1.0" encoding="utf-8"?>
android:layout_margin="10dp"
android:orientation="vertical">

<TextView
android:layout_width="wrap_content" android:layout_height="wrap_content"
android:text="Message" android:textSize="30sp"/>

<EditText
android:id="@+id/editText" android:layout_width="match_parent"
android:layout_height="wrap_content" android:singleLine="true" android:textSize="30sp"/>

<Button
android:id="@+id/button" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:layout_margin="30dp"
android:layout_gravity="center" android:text="Notify"android:textSize="30sp"/>
</LinearLayout>
```

ANDROIDMANIFEST.XML

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

package="com.alert"> <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/Theme.Alert">
<activity
android:name=".SecondActivity" android:exported="true" />
<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>

CREATING A NEW ACTIVITY

Createanewactivitynamed“Secon

dActivity” File -> New -> Activity

-> EmptyActivity

SECONDACTIVITY.JAVA

package com.alert;

import androidx.appcompat.app.AppCompatActivity; import
android.os.Bundle; public class SecondActivity extends
AppCompatActivity{ @Override
protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState);
setContentView(R.layout.activity_second);
}
}
ACTIVITY_SECOND.XML

<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayoutxmlns: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=".SecondActivity">

</androidx.constraintlayout.widget.ConstraintLayout>

CODE:

/MainActivity.kt

```
package com.example.notifier

import android.Manifest
import  android.app.NotificationChannel
import  android.app.NotificationManager
import android.content.Context
import android.content.pm.PackageManager
import android.os.Build
import android.os.Bundle
import android.widget.Toast
import androidx.activity.ComponentActivity
import androidx.activity.compose.rememberLauncherForActivityResult
import androidx.activity.compose.setContent
import androidx.activity.result.contract.ActivityResultContracts
import androidx.compose.foundation.layout.Arrangement
import androidx.compose.foundation.layout.Column
import androidx.compose.foundation.layout.fillMaxSize
import androidx.compose.foundation.layout.padding
import androidx.compose.material3.Button
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Surface
import androidx.compose.material3.Text
import androidx.compose.runtime.Composable
import androidx.compose.runtime.mutableStateOf
import androidx.compose.runtime.remember
import androidx.compose.runtime.getValue
import androidx.compose.runtime.setValue
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.unit.dp
import androidx.core.app.NotificationCompat
import androidx.core.app.NotificationManagerCompat
import androidx.core.content.ContextCompat
import kotlin.random.Random

class MainActivity : ComponentActivity() {
    private val CHANNEL_ID = "notification_channel"

    // List of quotes to display in notifications
    private val quotes = listOf(
        "The only way to do great work is to love what you do. - Steve Jobs",
        "Life is what happens when you're busy making other plans. - John
Lennon",
        "The future belongs to those who believe in the beauty of their
dreams. - Eleanor Roosevelt",
        "Success is not final, failure is not fatal: It is the courage to
continue that counts. - Winston Churchill",
```

```
        "The best time to plant a tree was 20 years ago. The second best time
is now. - Chinese Proverb",
        "Your time is limited, don't waste it living someone else's life. -
Steve Jobs",
        "If you set your goals ridiculously high and it's a failure, you will
fail above everyone else's success. - James Cameron",
        "It does not matter how slowly you go as long as you do not stop. -
Confucius",
        "Everything you've ever wanted is on the other side of fear. - George
Addair",
        "Success usually comes to those who are too busy to be looking for it.
- Henry David Thoreau"
    )

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)

        // Create notification channel (required for Android 8.0 and above)
        createNotificationChannel()

        setContent {
            MaterialTheme {
                Surface(
                    modifier = Modifier.fillMaxSize(),
                    color = MaterialTheme.colorScheme.background
                ) {
                    NotificationScreen(CHANNEL_ID, quotes)
                }
            }
        }
    }

    private fun createNotificationChannel() {
        // Create the NotificationChannel, but only on API 26+ (Android 8.0)
        if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
            val name = "Quotes Channel"
            val descriptionText = "A channel for motivational quotes"
            val importance = NotificationManager.IMPORTANCE_DEFAULT
            val channel = NotificationChannel(CHANNEL_ID, name,
importance).apply {
                description = descriptionText
            }
            // Register the channel with the system
            val notificationManager: NotificationManager =
                getSystemService(Context.NOTIFICATION_SERVICE) as
NotificationManager
            notificationManager.createNotificationChannel(channel)
        }
    }
}

@Composable
```

```
fun NotificationScreen(channelId: String, quotes: List<String>) {
    val context = LocalContext.current
    var hasNotificationPermission by remember {
        mutableStateOf(
            if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.TIRAMISU) {
                ContextCompat.checkSelfPermission(
                    context,
                    Manifest.permission.POST_NOTIFICATIONS
                ) == PackageManager.PERMISSION_GRANTED
            } else {
                true // Permission not required for Android < 13
            }
        )
    }

    // Request permission launcher
    val permissionLauncher = rememberLauncherForActivityResult(
        contract = ActivityResultContracts.RequestPermission()
    ) { isGranted ->
        hasNotificationPermission = isGranted
        if (isGranted) {
            showQuoteNotification(context, channelId, quotes)
        } else {
            Toast.makeText(
                context,
                "Notification permission denied",
                Toast.LENGTH_SHORT
            ).show()
        }
    }

    Column(
        modifier = Modifier
            .fillMaxSize()
            .padding(16.dp),
        verticalArrangement = Arrangement.Center,
        horizontalAlignment = Alignment.CenterHorizontally
    ) {
        Button(
            onClick = {
                if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.TIRAMISU) {
                    if (hasNotificationPermission) {
                        showQuoteNotification(context, channelId, quotes)
                    } else {

permissionLauncher.launch(Manifest.permission.POST_NOTIFICATIONS)
                    }
                } else {
                    showQuoteNotification(context, channelId, quotes)
                }
            }
        ) {
```

```
            Text("Send Quote Notification")
        }
    }
}

private fun showQuoteNotification(context: Context, channelId: String, quotes:
List<String>) {
    // Select a random quote from the list
    val randomQuote = quotes[Random.nextInt(quotes.size)]

    // Split the quote into the quote text and author
    val parts = randomQuote.split(" - ")
    val quoteText = parts[0]
    val author = if (parts.size > 1) parts[1] else "Unknown"

    // Build the notification
    val builder = NotificationCompat.Builder(context, channelId)
        .setSmallIcon(android.R.drawable.ic_dialog_info)
        .setContentTitle("Quote of the Moment")
        .setContentText(quoteText)
        .setStyle(NotificationCompat.BigTextStyle()
            .bigText(quoteText)
            .setSummaryText("- $author"))
        .setPriority(NotificationCompat.PRIORITY_DEFAULT)

    // Show the notification with a unique ID so multiple quotes can be
displayed
    val notificationId = Random.nextInt(1000)
    with(NotificationManagerCompat.from(context)) {
        try {
            // Post notification
            notify(notificationId, builder.build())
        } catch (e: SecurityException) {
            // This should not happen if we've properly checked permissions
            Toast.makeText(
                context,
                "Failed to show notification: ${e.message}",
                Toast.LENGTH_SHORT
            ).show()
            e.printStackTrace()
        }
    }
}
```

/libs.versions.toml

```
[versions]
agp = "8.9.1"
kotlin = "2.0.21"
coreKtx = "1.10.1"
junit = "4.13.2"
junitVersion = "1.1.5"
```

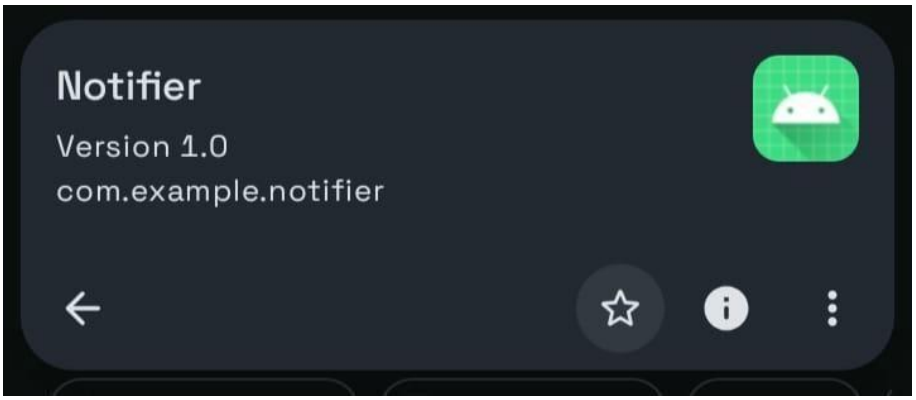
```
espressoCore = "3.5.1"
lifecycleRuntimeKtx = "2.6.1"
activityCompose = "1.8.0"
composeBom = "2024.09.00"

[libraries]
androidx-core-ktx = { group = "androidx.core", name = "core-ktx", version.ref
= "coreKtx" }
junit = { group = "junit", name = "junit", version.ref = "junit" }
androidx-junit = { group = "androidx.test.ext", name = "junit", version.ref =
"junitVersion" }
androidx-espresso-core = { group = "androidx.test.espresso", name = "espresso-
core", version.ref = "espressoCore" }
androidx-lifecycle-runtime-ktx = { group = "androidx.lifecycle", name =
"lifecycle-runtime-ktx", version.ref = "lifecycleRuntimeKtx" }
androidx-activity-compose = { group = "androidx.activity", name = "activity-
compose", version.ref = "activityCompose" }
androidx-compose-bom = { group = "androidx.compose", name = "compose-bom",
version.ref = "composeBom" }
androidx-ui = { group = "androidx.compose.ui", name = "ui" }
androidx-ui-graphics = { group = "androidx.compose.ui", name = "ui-graphics" }
androidx-ui-tooling = { group = "androidx.compose.ui", name = "ui-tooling" }
androidx-ui-tooling-preview = { group = "androidx.compose.ui", name = "ui-
tooling-preview" }
androidx-ui-test-manifest = { group = "androidx.compose.ui", name = "ui-test-
manifest" }
androidx-ui-test-junit4 = { group = "androidx.compose.ui", name = "ui-test-
junit4" }
androidx-material3 = { group = "androidx.compose.material3", name =
"material3" }

[plugins]
android-application = { id = "com.android.application", version.ref = "agp" }
kotlin-android = { id = "org.jetbrains.kotlin.android", version.ref =
"kotlin" }
kotlin-compose = { id = "org.jetbrains.kotlin.plugin.compose", version.ref =
"kotlin" }
```

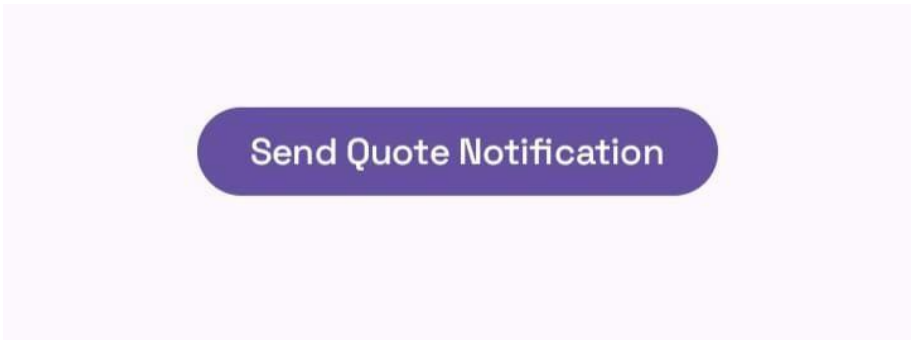
/build.gradle.kts

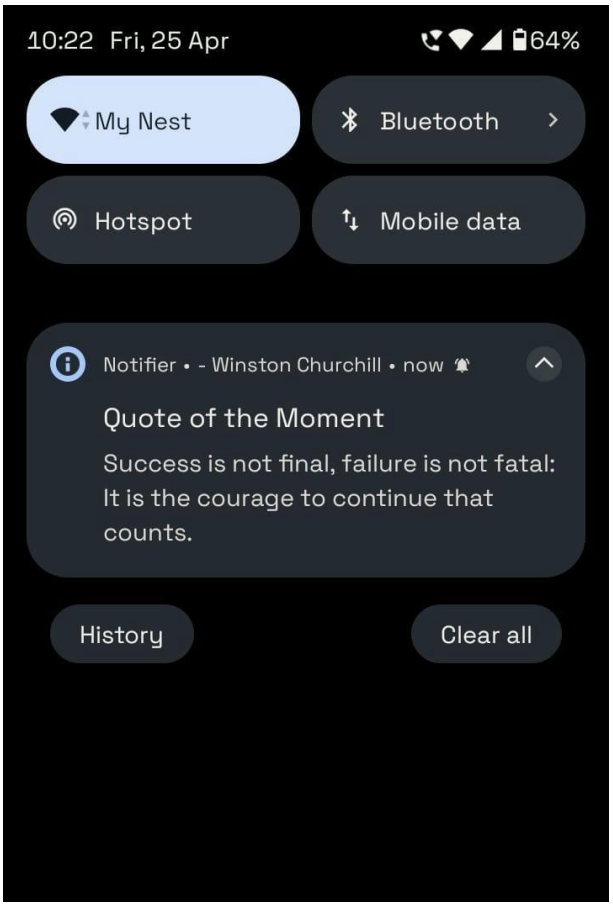
```
plugins {
    alias(libs.plugins.android.application)
    alias(libs.plugins.kotlin.android)
    alias(libs.plugins.kotlin.compose)
}

android {
    namespace = "com.example.notifier"
    compileSdk = 35

    defaultConfig {
```

```
        applicationId = "com.example.notifier"
        minSdk = 24
        targetSdk = 35
        versionCode = 1
        versionName = "1.0"

        testInstrumentationRunner = "androidx.test.runner.AndroidJUnitRunner"
    }

    buildTypes {
        release {
            isMinifyEnabled = false
            proguardFiles(
                getDefaultProguardFile("proguard-android-optimize.txt"),
                "proguard-rules.pro"
            )
        }
    }
    compileOptions {
        sourceCompatibility = JavaVersion.VERSION_11
        targetCompatibility = JavaVersion.VERSION_11
    }
    kotlinOptions {
        jvmTarget = "11"
    }
    buildFeatures {
        compose = true
    }
}

dependencies {

    implementation(libs.androidx.core.ktx)
    implementation(libs.androidx.lifecycle.runtime.ktx)
    implementation(libs.androidx.activity.compose)
    implementation(platform(libs.androidx.compose.bom))
    implementation(libs.androidx.ui)
    implementation(libs.androidx.ui.graphics)
    implementation(libs.androidx.ui.tooling.preview)
    implementation(libs.androidx.material3)
    testImplementation(libs.junit)
    androidTestImplementation(libs.androidx.junit)
    androidTestImplementation(libs.androidx.espresso.core)
    androidTestImplementation(platform(libs.androidx.compose.bom))
    androidTestImplementation(libs.androidx.ui.test.junit4)
    debugImplementation(libs.androidx.ui.tooling)
    debugImplementation(libs.androidx.ui.test.manifest)
}
```

OUTPUT:


Notifier
Version 1.0
com.example.notifier


Send Quote Notification


10:22 Fri, 25 Apr
64%
My Nest
Bluetooth
Hotspot
Mobile data
Notifier • - Winston Churchill • now
Quote of the Moment
Success is not final, failure is not fatal: It is the courage to continue that counts.
History
Clear all

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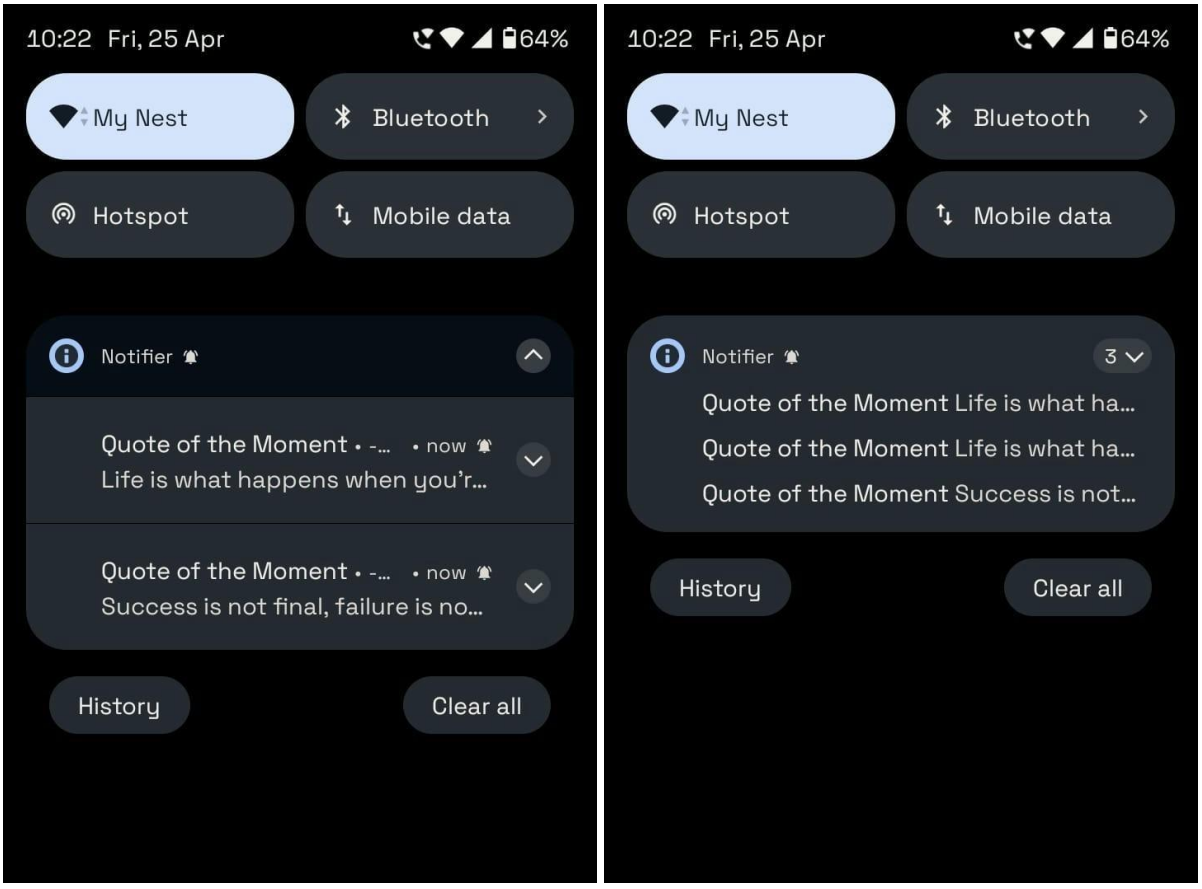

Observation:
The mobile application demonstrates a simple and functional interface centered around sending notifications. Upon clicking the "Send Quote Notification" button, inspirational quotes are pushed as notifications to the device's notification panel. The notifications are grouped under the app name "Notifier," and multiple quotes can be displayed at once, stacked neatly for easy viewing. The interface ensures a smooth user experience by effectively managing multiple notifications and maintaining clarity.

9913 MC Postlab 10

Observation:

The experiment successfully demonstrates the creation of an android application that generates an alert upon receiving a message. Through this practical, students gained hands-on experience with Android Studio, SDK and key development tools such as Gradle and JDK. By designing and implementing the message receiving functionality, we learned how to interact with the Android broadcast system and user interface components. The experiment also provided valuable exposure to software tools commonly used in network simulation and mobile application development.