**ANDROID STUDIO CODE:**

* *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"  
 android:background="#D8ECEB"  
 tools:context=".MainActivity">  
  
  
 <TextView  
 android:id="@+id/t5"  
 android:layout\_width="210dp"  
 android:layout\_height="30dp"  
 android:layout\_marginStart="8dp"  
 android:layout\_marginTop="8dp"  
 android:background="#FFFFFF"  
 android:text="Water Level"  
 android:textAppearance="@style/TextAppearance.AppCompat.Medium"  
 android:textStyle="bold"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/t3" />  
  
 <TextView  
 android:id="@+id/t4"  
 android:layout\_width="164dp"  
 android:layout\_height="30dp"  
 android:layout\_marginStart="8dp"  
 android:background="#FFFFFF"  
 android:textStyle="bold"  
 app:layout\_constraintStart\_toEndOf="@+id/t3"  
 app:layout\_constraintTop\_toBottomOf="@+id/t2" />  
  
 <TextView  
 android:id="@+id/t3"  
 android:layout\_width="210dp"  
 android:layout\_height="30dp"  
 android:layout\_marginStart="8dp"  
 android:background="#FFFFFF"  
 android:text="Volume"  
 android:textAppearance="@style/TextAppearance.AppCompat.Medium"  
 android:textStyle="bold"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/t2" />  
  
 <TextView  
 android:id="@+id/t6"  
 android:layout\_width="164dp"  
 android:layout\_height="25dp"  
 android:layout\_marginStart="8dp"  
 android:layout\_marginTop="8dp"  
 android:background="#FFFFFF"  
 android:textStyle="bold"  
 app:layout\_constraintStart\_toEndOf="@+id/t5"  
 app:layout\_constraintTop\_toBottomOf="@+id/t4" />  
  
 <ProgressBar  
 android:id="@+id/progress"  
 style="?android:attr/progressBarStyleHorizontal"  
 android:layout\_width="211dp"  
 android:layout\_height="205dp"  
 android:layout\_marginStart="8dp"  
 android:layout\_marginTop="8dp"  
 android:layout\_marginEnd="8dp"  
 android:indeterminate="false"  
 android:max="100"  
 android:progress="50"  
  
  
 android:progressDrawable="@drawable/circular"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
 <TextView  
 android:id="@+id/t2"  
 android:layout\_width="179dp"  
 android:layout\_height="35dp"  
 android:layout\_marginStart="32dp"  
 android:layout\_marginTop="8dp"  
 android:layout\_marginEnd="32dp"  
 android:text="SENSOR STATUS"  
 android:textAppearance="@style/TextAppearance.AppCompat.Large"  
 android:textStyle="bold"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/progress" />  
  
 <Switch  
 android:id="@+id/switch1"  
 android:layout\_width="177dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="8dp"  
 android:layout\_marginTop="8dp"  
 android:layout\_marginEnd="8dp"  
 android:layout\_marginBottom="8dp"  
 android:text="Switch"  
 android:checked="false"  
 android:textOff="OFF"  
 android:textOn="ON"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.495"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="@+id/progress"  
 app:layout\_constraintVertical\_bias="0.597" />  
  
  
</android.support.constraint.ConstraintLayout>

* *AndroidManifest.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"  
 package="com.example.watertankmanagement">  
  
 <uses-permission android:name="android.permission.INTERNET"/>  
 <uses-permission android:name="android.permission.ACCESS\_NETWORK\_STATE"/>  
 <uses-permission android:name="android.permission.WAKE\_LOCK"/>  
  
 <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"  
 tools:ignore="GoogleAppIndexingWarning"  
 >  
 <activity android:name=".MainActivity">  
 <intent-filter>  
 <action android:name="android.intent.action.MAIN" />  
  
 <category android:name="android.intent.category.LAUNCHER" />  
 </intent-filter>  
 </activity>  
 <service android:name="org.eclipse.paho.android.service.MqttService"/>  
 </application>  
  
  
</manifest>

* *Build.gradle (app)*
* apply plugin: 'com.android.application'  
    
  android {  
   compileSdkVersion 28  
   defaultConfig {  
   applicationId "com.example.watertankmanagement"  
   minSdkVersion 21  
   targetSdkVersion 28  
   versionCode 1  
   versionName "1.0"  
   // multiDexEnabled true  
   testInstrumentationRunner "android.support.test.runner.AndroidJUnitRunner"  
   }  
   buildTypes {  
   release {  
   minifyEnabled false  
   proguardFiles getDefaultProguardFile('proguard-android-optimize.txt'), 'proguard-rules.pro'  
   }  
   }  
  }  
    
  configurations.all {  
   resolutionStrategy.eachDependency { DependencyResolveDetails details ->  
   def requested = details.requested  
   if (requested.group == "com.android.support") {  
   if (!requested.name.startsWith("multidex")) {  
   details.useVersion "26.+"  
   }  
   }  
   }  
  }  
  dependencies {  
   implementation fileTree(dir: 'libs', include: ['\*.jar'])  
   implementation 'com.android.support:appcompat-v7:28.0.0'  
   implementation 'com.android.support.constraint:constraint-layout:1.1.3'  
   testImplementation 'junit:junit:4.12'  
   androidTestImplementation 'com.android.support.test:runner:1.0.2'  
   androidTestImplementation 'com.android.support.test.espresso:espresso-core:3.0.2'  
   implementation('org.eclipse.paho:org.eclipse.paho.android.service:1.0.2') {  
   exclude module: 'support-v4'  
   }  
   implementation 'org.eclipse.paho:org.eclipse.paho.client.mqttv3:1.0.2'  
   // implementation 'org.eclipse.paho:org.eclipse.paho.android.service:1.0.2'  
  }
* *MainActivity.java*

package com.example.watertankmanagement;  
import android.app.Notification;  
import android.app.NotificationManager;  
import android.app.PendingIntent;  
import android.content.Context;  
import android.content.Intent;  
import android.support.v7.app.AppCompatActivity;  
import android.os.Bundle;  
import android.support.v7.app.NotificationCompat;  
import android.util.Log;  
import android.widget.CompoundButton;  
import android.widget.ProgressBar;  
import android.widget.Switch;  
import android.widget.TextView;  
  
  
import org.eclipse.paho.android.service.MqttAndroidClient;  
import org.eclipse.paho.client.mqttv3.IMqttActionListener;  
import org.eclipse.paho.client.mqttv3.IMqttDeliveryToken;  
import org.eclipse.paho.client.mqttv3.IMqttToken;  
import org.eclipse.paho.client.mqttv3.MqttCallback;  
import org.eclipse.paho.client.mqttv3.MqttClient;  
import org.eclipse.paho.client.mqttv3.MqttConnectOptions;  
import org.eclipse.paho.client.mqttv3.MqttException;  
import org.eclipse.paho.client.mqttv3.MqttMessage;  
import java.lang.Exception;  
  
public class MainActivity extends AppCompatActivity {  
  
 ProgressBar progress;  
 Switch sw;  
 NotificationCompat.Builder mBuilder;  
  
 private NotificationManager notificationManager;  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 progress = findViewById(R.id.*progress*);  
 progress.setIndeterminate(false);  
 progress.setMax(100);  
 progress.setProgress(0);  
 notificationManager = (NotificationManager) this.getSystemService(Context.*NOTIFICATION\_SERVICE*);  
 sw = (Switch) findViewById(R.id.*switch1*);  
 sw.setClickable(false);  
  
  
 connect();  
 }  
  
 public void connect() {  
  
 String clientId = MqttClient.*generateClientId*();  
 Log.*e*("main activity","client id...."+clientId);  
 final MqttAndroidClient client =  
 new MqttAndroidClient(MainActivity.this, "tcp://postman.cloudmqtt.com:17623",  
 clientId);  
  
 MqttConnectOptions options = new MqttConnectOptions();  
 options.setMqttVersion(MqttConnectOptions.*MQTT\_VERSION\_3\_1*);  
 options.setCleanSession(false);  
 options.setUserName("amxdrcfm");  
 options.setPassword("g3bSxLJUUDqp".toCharArray());  
 try {  
 IMqttToken token = client.connect(options);  
 //IMqttToken token = client.connect();  
 token.setActionCallback(new IMqttActionListener() {  
 @Override  
 public void onSuccess(IMqttToken asyncActionToken) {  
 Log.*e*("file", "onSuccess");  
 //publish(client,"payloadd");  
 subscribe(client, "WLM");  
 client.setCallback(new MqttCallback() {  
 TextView t4 = (TextView) findViewById(R.id.*t4*);  
 TextView t6 = (TextView) findViewById(R.id.*t6*);  
  
  
 @Override  
 public void connectionLost(Throwable cause) {  
 Log.*e*("file", "connectionLost");  
 }  
  
  
  
  
 @Override  
 public void messageArrived(String topic, MqttMessage message) throws Exception {  
 Log.*e*("file","message arrived...."+ message.toString());  
  
 String str = message.toString();  
  
 String[] arrSplit = str.split(",");  
  
 if (topic.equals("WLM")) {  
 t4.setText(arrSplit[0]);  
 t6.setText(arrSplit[1]);  
 Log.*e*("messageArrived","messageArrived......"+arrSplit[2]);  
 progress.setProgress(Integer.*parseInt*(arrSplit[2].trim()));  
 mBuilder = new NotificationCompat.Builder(MainActivity.this);  
 if(Integer.*parseInt*(arrSplit[2].trim()) > 80){  
 sw.setChecked(false);  
 mBuilder.setSmallIcon(R.mipmap.*ic\_launcher*);  
 mBuilder.setContentTitle("water status");  
 mBuilder.setContentText("motor is switched off, waterlevel is over 80%");  
 sendNotification();  
 }else{  
 sw.setChecked(true);  
 mBuilder.setSmallIcon(R.mipmap.*ic\_launcher*);  
 mBuilder.setContentTitle("water status");  
 mBuilder.setContentText("motor is switched on, waterlevel is less than 20%");  
 sendNotification();  
 }  
  
  
 }  
  
  
  
 }  
  
 @Override  
 public void deliveryComplete(IMqttDeliveryToken token) {  
 Log.*e*("file", "deliveryComplete........");  
 }  
 });  
 }  
  
 @Override  
 public void onFailure(IMqttToken asyncActionToken, Throwable exception) {  
 Log.*e*("file", "onFailure......................");  
  
 }  
 });  
 } catch (MqttException e) {  
 e.printStackTrace();  
 }  
 }  
  
 public void subscribe(MqttAndroidClient client, String topic) {  
 int qos = 1;  
 try {  
 IMqttToken subToken = client.subscribe(topic, qos);  
 subToken.setActionCallback(new IMqttActionListener() {  
  
 @Override  
 public void onSuccess(IMqttToken asyncActionToken) {  
 Log.*e*("subscribe","onsuccess.................");  
 }  
  
 @Override  
 public void onFailure(IMqttToken asyncActionToken,  
 Throwable exception) {  
 Log.*e*("subscribe","onFailure.................");  
 }  
 });  
 } catch (MqttException e) {  
 e.printStackTrace();  
 }  
 }  
  
  
  
  
 private void sendNotification() {  
 Intent notificationIntent = new Intent(this, MainActivity.class);  
 PendingIntent contentIntent = PendingIntent.*getActivity*(this, 0, notificationIntent, PendingIntent.*FLAG\_UPDATE\_CURRENT*);  
 mBuilder.setContentIntent(contentIntent);  
 Notification notification = mBuilder.build();  
 notification.flags |= Notification.*FLAG\_AUTO\_CANCEL*;  
 notification.defaults |= Notification.*DEFAULT\_SOUND*;  
 //currentNotificationID++;  
 int notificationId = 0;  
 if (notificationId == Integer.*MAX\_VALUE* - 1)  
 notificationId = 0;  
 notificationManager.notify(notificationId, notification);  
  
  
 }  
  
  
}

* *Circular.xml*
* <?xml version="1.0" encoding="utf-8"?>  
    
  <layer-list xmlns:android="http://schemas.android.com/apk/res/android">  
   <item android:id="@android:id/secondaryProgress">  
   <shape  
   android:innerRadiusRatio="6"  
   android:shape="ring"  
   android:thicknessRatio="20.0"  
   android:useLevel="true">  
    
    
   <gradient  
   android:centerColor="#999999"  
   android:endColor="#999999"  
   android:startColor="#999999"  
   android:type="sweep" />  
   </shape>  
   </item>  
    
   <item android:id="@android:id/progress">  
   <rotate  
   android:fromDegrees="270"  
   android:pivotX="50%"  
   android:pivotY="50%"  
   android:toDegrees="270">  
    
   <shape  
   android:innerRadiusRatio="6"  
   android:shape="ring"  
   android:thicknessRatio="20.0"  
   android:useLevel="true">  
    
    
   <rotate  
   android:fromDegrees="0"  
   android:pivotX="50%"  
   android:pivotY="50%"  
   android:toDegrees="360" />  
    
   <gradient  
   android:centerColor="#00FF00"  
   android:endColor="#00FF00"  
   android:startColor="#00FF00"  
   android:type="sweep" />  
    
   </shape>  
   </rotate>  
   </item>  
  </layer-list>