**Software for Mobile Devices**

**Task 10**

Name: Huraira Muzammal

Section: BCS 6B

Roll number: 22F-3853

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Submitted to: Mam Kanwal Naz

Question 1:

Download Service.java

package com.example.foregroundservice;  
  
import android.app.Service;  
import android.content.Intent;  
import android.os.IBinder;  
import android.util.Log;  
  
import androidx.annotation.Nullable;  
  
public class DownloadService extends Service {  
 @Nullable  
 @Override  
 public IBinder onBind(Intent intent) {  
 return null;  
 }  
  
 @Override  
 public int onStartCommand(Intent intent, int flags, int startId) {  
  
 Log.*d*("services","Service onstartCommand");  
  
 new Thread(()->{  
 for (int i=0;i<=100;i+=100)  
 {  
 Log.*d*("services","Download Progress"+i+"%");  
  
 try  
 {  
 Thread.*sleep*(1000);  
 } catch (InterruptedException e) {  
 e.printStackTrace();  
 }  
 }  
 }).start();  
 return *START\_STICKY*;  
 }  
}

Foreground service

package com.example.foregroundservice;  
  
import android.app.Notification;  
import android.app.Service;  
import android.content.Intent;  
import android.os.IBinder;  
  
import androidx.annotation.Nullable;  
  
public class ForegroundService extends Service {  
  
 @Override  
 public int onStartCommand(Intent intent, int flags, int startId) {  
 Notification notification=new Notification  
 .Builder(this,"channel\_id").setContentTitle("Foreground Service").setContentText("Running....").setSmallIcon(R.drawable.*ic\_launcher\_foreground*).build();  
 startForeground(1,notification);  
 new Thread(()->{}).start();  
 return *START\_STICKY*;  
 }  
  
 @Nullable  
 @Override  
 public IBinder onBind(Intent intent) {  
 return null;  
 }  
}

Activtiy main java

package com.example.foregroundservice;  
  
import android.content.Intent;  
import android.os.Bundle;  
import android.widget.Button;  
  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
  
 Button startBtn,stopBtn;  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
 startBtn=findViewById(R.id.*btn1*);  
 stopBtn=findViewById(R.id.*button3*);  
  
 startBtn.setOnClickListener(view->startService(new Intent(this,DownloadService.class)));  
 stopBtn.setOnClickListener(view->stopService(new Intent(this, DownloadService.class)));  
 }  
}

activity main 2.java

package com.example.foregroundservice;  
  
import android.content.ComponentName;  
import android.content.Context;  
import android.content.Intent;  
import android.content.ServiceConnection;  
import android.os.Bundle;  
import android.os.IBinder;  
import android.widget.Button;  
  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
public class MainActivity2 extends AppCompatActivity {  
 private MusicServices musicServices;  
 private boolean isBound=false;  
 private Button playBtn,pauseBtn;  
  
  
 private ServiceConnection serviceConnection=new ServiceConnection() {  
 @Override  
 public void onServiceConnected(ComponentName name, IBinder service) {  
 MusicServices.MusicBinder binder=(MusicServices.MusicBinder)service;  
 musicServices=binder.getService();  
 isBound=true;  
 }  
  
 @Override  
 public void onServiceDisconnected(ComponentName name) {  
 isBound=false;  
 }  
 };  
  
  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.enable(this);  
 setContentView(R.layout.activity\_main2);  
 playBtn=findViewById(R.id.button5);  
 pauseBtn=findViewById(R.id.button6);  
  
  
 Intent intent=new Intent(this, MusicServices.class);  
 Intent serviceIntent = new Intent(this, MusicServices.class);  
 startService(serviceIntent); // This triggers onStartCommand()  
 bindService(serviceIntent, serviceConnection, Context.BIND\_AUTO\_CREATE);  
  
 bindService(intent,serviceConnection, Context.BIND\_AUTO\_CREATE);  
  
 playBtn.setOnClickListener(v->{if(isBound)musicServices.play(); Intent startIntent = new Intent(this, MusicServices.class);  
 startService(startIntent);});  
 pauseBtn.setOnClickListener(v->{if (isBound)musicServices.pause(); Intent stopIntent = new Intent(this, MusicServices.class);  
 stopService(stopIntent);});  
  
 }  
}

mediaplayer.java

package com.example.foregroundservice;  
  
import android.app.Notification;  
import android.app.NotificationChannel;  
import android.app.NotificationManager;  
import android.app.Service;  
import android.content.Intent;  
import android.media.MediaPlayer;  
import android.os.Binder;  
import android.os.Build;  
import android.os.Bundle;  
import android.os.IBinder;  
import android.util.Log;  
  
import androidx.activity.EdgeToEdge;  
import androidx.annotation.Nullable;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.app.NotificationCompat;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
public class MusicServices extends Service {  
  
 private MediaPlayer mediaPlayer;  
 private static final String *TAG*="MusicService";  
  
 private final IBinder binder=new MusicBinder();  
  
  
 public class MusicBinder extends Binder {  
 public MusicServices getService(){  
 return MusicServices.this;  
 }  
 }  
  
 @Override  
 public void onCreate() {  
 super.onCreate();  
  
 if (Build.VERSION.*SDK\_INT* >= Build.VERSION\_CODES.*O*) {  
 NotificationChannel channel = new NotificationChannel(  
 "music\_channel\_id",  
 "Music Playback",  
 NotificationManager.*IMPORTANCE\_LOW* );  
 channel.setDescription("Channel for music playback service");  
  
 NotificationManager manager = getSystemService(NotificationManager.class);  
 if (manager != null) {  
 manager.createNotificationChannel(channel);  
 }  
 }  
 }  
  
  
 @Override  
 public int onStartCommand(Intent intent, int flags, int startId) {  
  
 Notification notification = new NotificationCompat.Builder(this, "music\_channel\_id")  
 .setContentTitle("Playing Music")  
 .setContentText("Your tune is playing in the background.")  
 .setSmallIcon(R.drawable.*ic\_launcher\_foreground*) // Must be a valid icon  
 .setPriority(NotificationCompat.*PRIORITY\_LOW*)  
 .build();  
  
 startForeground(1, notification);  
  
 return *START\_STICKY*;  
 }  
  
  
 @Override  
 public void onDestroy() {  
 if(mediaPlayer!=null)  
 {  
 mediaPlayer.release();  
 mediaPlayer=null;  
 }  
 super.onDestroy();  
 }  
  
 @Nullable  
 @Override  
 public IBinder onBind(Intent intent) {  
 Log.*d*(*TAG*,"Service Bound");  
 return binder;  
 }  
  
 @Override  
 public boolean onUnbind(Intent intent) {  
 Log.*d*(*TAG*,"Service unbound");  
 return super.onUnbind(intent);  
 }  
  
 public void play()  
 {  
 if(mediaPlayer==null)  
 {  
 mediaPlayer=MediaPlayer.*create*(this,R.raw.*tune*);  
 mediaPlayer.setLooping(true);  
  
 }  
 mediaPlayer.start();  
 }  
  
 public void pause()  
 {  
 if(mediaPlayer!=null&& mediaPlayer.isPlaying())  
 {  
 mediaPlayer.pause();  
 }  
 stopForeground(true);  
 super.onDestroy();  
 }  
  
}

XML files

<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:id="@+id/textView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Hello World!"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
 <Button  
 android:id="@+id/btn1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="165dp"  
 android:layout\_marginTop="215dp"  
 android:layout\_marginEnd="156dp"  
 android:layout\_marginBottom="93dp"  
 android:text="Button"  
 app:layout\_constraintBottom\_toTopOf="@+id/textView"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
 <Button  
 android:id="@+id/button3"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="169dp"  
 android:text="Button"  
 app:layout\_constraintStart\_toStartOf="parent"  
 tools:layout\_editor\_absoluteY="500dp" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity2">  
  
 <Button  
 android:id="@+id/button5"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="160dp"  
 android:layout\_marginTop="140dp"  
 android:layout\_marginEnd="163dp"  
 android:layout\_marginBottom="40dp"  
 android:text="Play"  
 app:layout\_constraintBottom\_toTopOf="@+id/button6"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
 <Button  
 android:id="@+id/button6"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="160dp"  
 android:layout\_marginTop="281dp"  
 android:layout\_marginEnd="163dp"  
 android:layout\_marginBottom="15dp"  
 android:text="stop"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/button5" />  
  
 <TextView  
 android:id="@+id/textView2"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="176dp"  
 android:layout\_marginTop="249dp"  
 android:layout\_marginEnd="177dp"  
 android:layout\_marginBottom="260dp"  
 android:text="Activity2"  
 app:layout\_constraintBottom\_toTopOf="@+id/button6"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/button5" />  
</androidx.constraintlayout.widget.ConstraintLayout>

Output

A screenshot of a phone

AI-generated content may be incorrect.

Home task

Final code

Music service.java

package com.example.foregroundservice;  
  
import android.app.Notification;  
import android.app.NotificationChannel;  
import android.app.NotificationManager;  
import android.app.Service;  
import android.content.Intent;  
import android.media.MediaPlayer;  
import android.os.Binder;  
import android.os.Build;  
import android.os.Bundle;  
import android.os.IBinder;  
import android.util.Log;  
  
import androidx.activity.EdgeToEdge;  
import androidx.annotation.Nullable;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.app.NotificationCompat;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
public class MusicServices extends Service {  
  
 private MediaPlayer mediaPlayer;  
 private static final String *TAG*="MusicService";  
  
 private final IBinder binder=new MusicBinder();  
  
  
 public class MusicBinder extends Binder {  
 public MusicServices getService(){  
 return MusicServices.this;  
 }  
 }  
  
 @Override  
 public void onCreate() {  
 super.onCreate();  
  
 if (Build.VERSION.*SDK\_INT* >= Build.VERSION\_CODES.*O*) {  
 NotificationChannel channel = new NotificationChannel(  
 "music\_channel\_id",  
 "Music Playback",  
 NotificationManager.*IMPORTANCE\_LOW* );  
 channel.setDescription("Channel for music playback service");  
  
 NotificationManager manager = getSystemService(NotificationManager.class);  
 if (manager != null) {  
 manager.createNotificationChannel(channel);  
 }  
 }  
 }  
  
  
 @Override  
 public int onStartCommand(Intent intent, int flags, int startId) {  
  
 Notification notification = new NotificationCompat.Builder(this, "music\_channel\_id")  
 .setContentTitle("My Application")  
 .setContentText("App is Ringing")  
 .setSmallIcon(R.drawable.*ic\_launcher\_foreground*) // Must be a valid icon  
 .setPriority(NotificationCompat.*PRIORITY\_LOW*)  
 .build();  
  
 startForeground(1, notification);  
  
 return *START\_STICKY*;  
 }  
  
  
 @Override  
 public void onDestroy() {  
 if(mediaPlayer!=null)  
 {  
 mediaPlayer.release();  
 mediaPlayer=null;  
 }  
 super.onDestroy();  
 }  
  
 @Nullable  
 @Override  
 public IBinder onBind(Intent intent) {  
 Log.*d*(*TAG*,"Service Bound");  
 return binder;  
 }  
  
 @Override  
 public boolean onUnbind(Intent intent) {  
 Log.*d*(*TAG*,"Service unbound");  
 return super.onUnbind(intent);  
 }  
  
 public void play()  
 {  
 if(mediaPlayer==null)  
 {  
 mediaPlayer=MediaPlayer.*create*(this,R.raw.*tune*);  
 mediaPlayer.setLooping(true);  
  
 }  
 mediaPlayer.start();  
 }  
  
 public void pause()  
 {  
 if(mediaPlayer!=null&& mediaPlayer.isPlaying())  
 {  
 mediaPlayer.pause();  
 }  
 stopForeground(true);  
 super.onDestroy();  
 }  
  
}



