**THỰC HÀNH LAB5**

Bước 1:Xây dựng các file dimens.xml

<?xml version="1.0" encoding="utf-8"?>

<resources>

<dimen name="margin\_base">5dp</dimen>

<dimen name="text\_small">14sp</dimen>

<dimen name="text\_medium">16sp</dimen>

<dimen name="text\_medium\_large">18sp</dimen>

<dimen name="text\_large">20sp</dimen>

</resources>

A screenshot of a computer

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Bước 2: Xây dựng file strings.xml

<resources>  
 <string name="app\_name">LAB5-NGUYENHOANGDUY</string>  
 <string name="start">Start</string>  
 <string name="returned\_by\_bg\_thread">Returned by background thread: \n\n</string>  
 <string name="done\_background\_thread\_has\_been\_stopped">Done \nBackground thread has been stopped</string>  
 <string name="done">Done</string>  
 <string name="working">Working...</string>  
 <string name="global\_value\_seen">\n global value seen by all thread</string>  
</resources>

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Bước 3: Xây dựng giao diện activity\_main.xml

<?xml version="1.0" encoding="utf-8"?>  
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:padding="@dimen/margin\_base"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:id="@+id/tv\_working"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:textSize="@dimen/text\_medium\_large"  
 android:textStyle="bold"  
 android:text="@string/working" />  
  
 <ProgressBar  
 android:id="@+id/pb\_first"  
 style="?android:attr/progressBarStyleHorizontal"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="@dimen/margin\_base"  
 android:max="100" />  
  
 <TextView  
 android:id="@+id/tv\_return"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:textSize="@dimen/text\_medium"  
 android:text="@string/returned\_by\_bg\_thread" />  
  
 <FrameLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content">  
  
 <Button  
 android:id="@+id/btn\_start"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center"  
 android:text="@string/start" />  
  
 <ProgressBar  
 android:id="@+id/pb\_second"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center"  
 android:layout\_marginTop="@dimen/margin\_base" />  
 </FrameLayout>  
  
</LinearLayout>

Bước 4: Xây dựng MainActivity.java

package com.example.lab5\_nguyenhoangduy;  
import android.os.Bundle;  
import android.os.Handler;  
import android.os.Looper;  
import android.os.Message;  
import android.widget.Button;  
import android.widget.ProgressBar;  
import android.widget.TextView;  
import androidx.annotation.NonNull;  
import androidx.appcompat.app.AppCompatActivity;  
import java.util.Random;  
public class MainActivity extends AppCompatActivity {  
 private ProgressBar pbFirst, pbSecond;  
 private TextView tvMsgWorking, tvMsgReturned;  
 private boolean isRunning;  
 private int MAX\_SEC;  
 private int intTest;  
 private Thread bgThread;  
 private Handler handler;  
 private Button btnStart;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 findViewByIds();  
 initVariables();  
 initBgThread();  
 btnStart.setOnClickListener(v -> {  
 isRunning = !isRunning;  
 if (isRunning && !bgThread.isAlive()) {  
 initBgThread();  
 bgThread.start();  
 }  
 });  
 }  
  
 private void findViewByIds() {  
 pbFirst = findViewById(R.id.*pb\_first*);  
 pbSecond = findViewById(R.id.*pb\_second*);  
 tvMsgWorking = findViewById(R.id.*tv\_working*);  
 tvMsgReturned = findViewById(R.id.*tv\_return*);  
 btnStart = findViewById(R.id.*btn\_start*);  
 }  
  
 private void initVariables() {  
 isRunning = false;  
 MAX\_SEC = 100;  
 intTest = 0;  
 handler = new Handler(Looper.*getMainLooper*()) {  
 @Override  
 public void handleMessage(@NonNull Message msg) {  
 int random = msg.arg1;  
 int seen = msg.arg2;  
 tvMsgWorking.setText(getString(R.string.*working*));  
 tvMsgReturned.setText(getString(R.string.*returned\_by\_bg\_thread*) + random + getString(R.string.*global\_value\_seen*));  
 pbFirst.setProgress(seen % 101);  
 }  
 };  
 }  
  
 private void initBgThread() {  
 bgThread = new Thread(() -> {  
 Random r = new Random();  
 while (isRunning) {  
 intTest++;  
 int val = r.nextInt(101);  
 Message m = handler.obtainMessage(0, val, intTest);  
 handler.sendMessage(m);  
 try {  
 Thread.*sleep*(300);  
 } catch (InterruptedException e) {  
 break;  
 }  
 }  
 handler.post(() -> {  
 tvMsgWorking.setText(getString(R.string.*done\_background\_thread\_has\_been\_stopped*));  
 pbSecond.setIndeterminate(false);  
 });  
 });  
 }  
  
 @Override  
 protected void onStart() {  
 super.onStart();  
 initBgThread();  
 }  
  
 @Override  
 protected void onStop() {  
 super.onStop();  
 isRunning = false;  
 }  
}

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**Bài 2. Viết ứng dụng MultiThread sử dụng Post**

Bước 1: Xây dựng các file dimens.xml

<?xml version="1.0" encoding="utf-8"?>  
<resources>  
 <dimen name="margin\_base">5dp</dimen>  
 <dimen name="text\_small">14sp</dimen>  
 <dimen name="text\_medium">16sp</dimen>  
 <dimen name="text\_medium\_large">18sp</dimen>  
 <dimen name="text\_large">20sp</dimen>  
</resources>

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Bước 2: Xây dựng file strings.xml

<resources>  
 <string name="app\_name">LAB5-NGUYENHOANGDUY-MULTITHREAD</string>  
 <string name="bg\_work\_is\_over">Background work is over!</string>  
 <string name="execute">Execute</string>  
 <string name="enter\_some\_data\_here">Enter some data here</string>  
</resources>

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Bước 3: Xây dựng giao diện activity\_main.xml

<?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: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" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

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Bước 4: xây dựng Mainactivity.java

package com.example.lab5\_nguyenhoangduy\_multithread;

import android.os.Bundle;

import android.os.Handler;

import android.widget.Button;

import android.widget.EditText;

import android.widget.ProgressBar;

import android.widget.TextView;

import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

private ProgressBar pbWaiting;

private TextView tvTopCaption;

private EditText etInput;

private Button btnExecute;

private int globalValue, accum;

private long startTime;

private final String PATIENCE = "Some important data is being collected now.\nPlease be \npatient...wait...";

private Handler handler;

private Runnable fgRunnable, bgRunnable;

private Thread testThread;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

tvTopCaption = findViewById(R.id.tv\_top\_caption);

pbWaiting = findViewById(R.id.pb\_waiting);

etInput = findViewById(R.id.et\_input);

btnExecute = findViewById(R.id.btn\_execute);

globalValue = 0;

accum = 0;

startTime = System.currentTimeMillis();

handler = new Handler();

fgRunnable = new Runnable() {

@Override

public void run() {

globalValue += 100;

pbWaiting.setProgress(globalValue % 101);

}

};

bgRunnable = new Runnable() {

@Override

public void run() {

globalValue += 1;

accum += 1;

tvTopCaption.setText(PATIENCE);

pbWaiting.setProgress(globalValue % 101);

}

};

testThread = new Thread(new Runnable() {

@Override

public void run() {

while (accum < 100) {

handler.post(bgRunnable);

if (accum % 5 == 0) {

handler.post(fgRunnable);

}

try {

Thread.sleep(1000);

} catch (InterruptedException e) {

break;

}

}

handler.post(new Runnable() {

@Override

public void run() {

tvTopCaption.setText(getString(R.string.bg\_work\_is\_over));

}

});

}

});

testThread.start();

btnExecute.setOnClickListener(v ->

Toast.makeText(this, etInput.getText().toString(), Toast.LENGTH\_SHORT).show()

);

}

}

A screenshot of a computer program

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**Bài 3. Viết ứng dụng sử dụng Asynctask**

Bước 1: Xây dựng các file dimens.xml

<?xml version="1.0" encoding="utf-8"?>

<resources>

<dimen name="margin\_base">5dp</dimen>

<dimen name="text\_small">14sp</dimen>

<dimen name="text\_medium">16sp</dimen>

<dimen name="text\_medium\_large">18sp</dimen>

<dimen name="text\_large">20sp</dimen>

</resources>A screen shot of a computer

AI-generated content may be incorrect.

Bước 2: Xây dựng file strings.xml

<?xml version="1.0" encoding="utf-8"?>  
<resources>  
 <string name="app\_name">HOANGDUY-ASYNC\_TASK</string>  
 <string name="quick\_job">Quick Job</string>  
 <string name="slow\_job">Slow Job</string>  
 <string name="please\_wait">Some SLOW job is being done. Please wait...</string>  
</resources>

A screenshot of a computer

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Bước 3: Xây dựng giao diện

<?xml version="1.0" encoding="utf-8"?>

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:tools="http://schemas.android.com/tools"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical"

android:padding="@dimen/margin\_base"

tools:context=".MainActivity">

<TextView

android:id="@+id/tv\_status"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:textSize="@dimen/text\_medium" />

<LinearLayout

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:layout\_marginTop="@dimen/margin\_base"

android:orientation="horizontal">

<Button

android:id="@+id/btn\_quick\_job"

android:layout\_width="0dp"

android:layout\_height="wrap\_content"

android:layout\_weight="1"

android:text="@string/quick\_job" />

<Button

android:id="@+id/btn\_slow\_job"

android:layout\_width="0dp"

android:layout\_height="wrap\_content"

android:layout\_weight="1"

android:text="@string/slow\_job"

android:layout\_marginLeft="@dimen/margin\_base"/>

</LinearLayout>

</LinearLayout>A screen shot of a computer

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Bước 4: Xây dựng class SlowTask

private final Context ctx; // có/không dùng đều được, để khớp MainActivity  
private final TextView tvStatus;  
private final Button btnQuick, btnSlow;  
  
private long start, end;  
  
public SlowTask(Context ctx, TextView tvStatus, Button btnQuick, Button btnSlow) {  
 this.ctx = ctx;  
 this.tvStatus = tvStatus;  
 this.btnQuick = btnQuick;  
 this.btnSlow = btnSlow;  
}  
  
@Override  
protected void onPreExecute() {  
 btnQuick.setEnabled(false);  
 btnSlow.setEnabled(false);  
 start = System.*currentTimeMillis*();  
 tvStatus.setText("Start time: " + start + "\n");  
}  
  
@Override  
protected Void doInBackground(Void... voids) {  
 for (int i = 0; i < 3; i++) { // Working...0,1,2  
 publishProgress(i);  
 try {  
 Thread.*sleep*(2000);  
 } catch (InterruptedException ignored) {}  
 }  
 end = System.*currentTimeMillis*();  
 return null;  
}  
  
@Override  
protected void onProgressUpdate(Integer... values) {  
 tvStatus.append("Working..." + values[0] + "\n");  
}  
  
@Override  
protected void onPostExecute(Void aVoid) {  
 tvStatus.append("End Time: " + end + "\n");  
 tvStatus.append("Done!");  
 btnQuick.setEnabled(true);  
 btnSlow.setEnabled(true);  
}

Bước 5: xây dựng Mainactivity.java

package com.example.hoangduy\_asynctask;  
  
import android.os.Bundle;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
import android.widget.Button;  
import android.widget.TextView;  
import java.text.SimpleDateFormat;  
import java.util.Date;  
  
public class MainActivity extends AppCompatActivity {  
  
 private Button btnQuickJob, btnSlowJob;  
 private TextView tvStatus;  
 private SlowTask slowTask;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
 ViewCompat.*setOnApplyWindowInsetsListener*(findViewById(R.id.*main*), (v, insets) -> {  
 Insets b = insets.getInsets(WindowInsetsCompat.Type.*systemBars*());  
 v.setPadding(b.left, b.top, b.right, b.bottom);  
 return insets;  
 });  
  
 btnQuickJob = findViewById(R.id.*btn\_quick\_job*);  
 btnSlowJob = findViewById(R.id.*btn\_slow\_job*);  
 tvStatus = findViewById(R.id.*tv\_status*);  
  
 slowTask = new SlowTask(this, tvStatus, btnQuickJob, btnSlowJob);  
  
 btnQuickJob.setOnClickListener(v -> {  
 // Giống mẫu: in thời gian hiện hành ngay  
 SimpleDateFormat sdf = new SimpleDateFormat("dd/MM/yyyy HH:mm:ss");  
 tvStatus.setText(sdf.format(new Date())); // chỉ set 1 dòng thời gian  
 });  
  
 btnSlowJob.setOnClickListener(v -> slowTask.execute());  
 }  
}

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**Bài 4. Tạo 1 ứng dụng sử dụng Asynctask để phát nhạc**

Bước 1: xây dựng file strings.xml

<?xml version="1.0" encoding="utf-8"?>

<resources>

<string name="app\_name">MUSIC-NGUYENHOANGDUY</string>

<string name="play">Play</string>

<string name="pause">Pause</string>

<string name="resume">Resume</string>

<string name="stop">Stop</string>

<string name="preparing">Preparing...</string>

<string name="ready">Ready</string>

</resources>

Bước 2: xây dựng file dimens.xml

<?xml version="1.0" encoding="utf-8"?>

<resources>

<dimen name="margin\_base">5dp</dimen>

<dimen name="text\_medium">16sp</dimen>

</resources>

Bước 3:xây dựng activity\_main.xml

<?xml version="1.0" encoding="utf-8"?>

<LinearLayout

android:id="@+id/main"

xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:tools="http://schemas.android.com/tools"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical"

android:padding="@dimen/margin\_base"

tools:context=".MainActivity">

<TextView

android:id="@+id/tvStatus"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="@string/ready"

android:textSize="@dimen/text\_medium" />

<SeekBar

android:id="@+id/seek"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:paddingTop="@dimen/margin\_base"

android:enabled="false" />

<LinearLayout

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:orientation="horizontal"

android:paddingTop="@dimen/margin\_base">

<Button

android:id="@+id/btnPlay"

android:layout\_width="0dp"

android:layout\_height="wrap\_content"

android:layout\_weight="1"

android:text="@string/play" />

<Button

android:id="@+id/btnPause"

android:layout\_width="0dp"

android:layout\_height="wrap\_content"

android:layout\_weight="1"

android:text="@string/pause"

android:layout\_marginLeft="@dimen/margin\_base" />

<Button

android:id="@+id/btnStop"

android:layout\_width="0dp"

android:layout\_height="wrap\_content"

android:layout\_weight="1"

android:text="@string/stop"

android:layout\_marginLeft="@dimen/margin\_base" />

</LinearLayout>

</LinearLayout>

Bước 4: xây dựng MainActivity.java

package com.example.music\_nguyenhoangduy;

import android.media.MediaPlayer;

import android.os.AsyncTask;

import android.os.Bundle;

import android.os.Handler;

import android.widget.Button;

import android.widget.SeekBar;

import android.widget.TextView;

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 {

private Button btnPlay, btnPause, btnStop;

private TextView tvStatus;

private SeekBar seek;

private MediaPlayer mediaPlayer;

private final Handler uiHandler = new Handler();

private Runnable updater;

private MusicTask musicTask;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

EdgeToEdge.enable(this);

setContentView(R.layout.activity\_main);

ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {

Insets b = insets.getInsets(WindowInsetsCompat.Type.systemBars());

v.setPadding(b.left, b.top, b.right, b.bottom);

return insets;

});

tvStatus = findViewById(R.id.tvStatus);

seek = findViewById(R.id.seek);

btnPlay = findViewById(R.id.btnPlay);

btnPause= findViewById(R.id.btnPause);

btnStop = findViewById(R.id.btnStop);

btnPause.setEnabled(false);

btnStop.setEnabled(false);

btnPlay.setOnClickListener(v -> {

if (musicTask == null || musicTask.getStatus() == AsyncTask.Status.FINISHED) {

musicTask = new MusicTask();

musicTask.execute();

}

});

btnPause.setOnClickListener(v -> {

if (mediaPlayer == null) return;

if (mediaPlayer.isPlaying()) {

mediaPlayer.pause();

btnPause.setText(getString(R.string.resume));

tvStatus.setText("Paused");

} else {

mediaPlayer.start();

btnPause.setText(getString(R.string.pause));

tvStatus.setText("Playing");

startUpdatingProgress();

}

});

btnStop.setOnClickListener(v -> stopAndRelease());

}

private void startUpdatingProgress() {

if (mediaPlayer == null) return;

seek.setMax(mediaPlayer.getDuration());

if (updater == null) {

updater = new Runnable() {

@Override public void run() {

if (mediaPlayer != null && mediaPlayer.isPlaying()) {

seek.setProgress(mediaPlayer.getCurrentPosition());

uiHandler.postDelayed(this, 500);

}

}

};

}

uiHandler.post(updater);

}

private void stopAndRelease() {

uiHandler.removeCallbacksAndMessages(null);

if (mediaPlayer != null) {

try { mediaPlayer.stop(); } catch (Exception ignored) {}

try { mediaPlayer.release(); } catch (Exception ignored) {}

mediaPlayer = null;

}

btnPause.setText(getString(R.string.pause));

btnPause.setEnabled(false);

btnStop.setEnabled(false);

tvStatus.setText(getString(R.string.ready));

seek.setProgress(0);

}

@Override

protected void onStop() {

super.onStop();

stopAndRelease();

if (musicTask != null) musicTask.cancel(true);

}

@SuppressWarnings("deprecation")

private class MusicTask extends AsyncTask<Void, Void, MediaPlayer> {

@Override

protected void onPreExecute() {

tvStatus.setText(getString(R.string.preparing));

btnPlay.setEnabled(false);

btnPause.setEnabled(false);

btnStop.setEnabled(false);

}

@Override

protected MediaPlayer doInBackground(Void... voids) {

return MediaPlayer.create(MainActivity.this, R.raw.music);

}

@Override

protected void onPostExecute(MediaPlayer mp) {

mediaPlayer = mp;

if (mediaPlayer == null) {

tvStatus.setText("Cannot load music");

btnPlay.setEnabled(true);

return;

}

tvStatus.setText(getString(R.string.ready));

btnPlay.setEnabled(true);

btnPause.setEnabled(true);

btnStop.setEnabled(true);

mediaPlayer.setOnCompletionListener(m -> {

tvStatus.setText("Completed");

btnPause.setText(getString(R.string.pause));

btnPause.setEnabled(false);

btnStop.setEnabled(false);

seek.setProgress(seek.getMax());

});

mediaPlayer.start();

tvStatus.setText("Playing");

btnPause.setText(getString(R.string.pause));

startUpdatingProgress();

}

}

}

Bước 6: tạo thư mục app/src/main/res/raw/ và chép file music.mp3 vào đó

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Kết quả:

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