Bài 1: Viết một ứng dụng MultiThread sử dụng Message.

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package com.example.lab6;  
  
import android.os.Bundle;  
import android.os.Handler;  
import android.os.Looper;  
import android.os.Message;  
import androidx.appcompat.app.AppCompatActivity;  
import android.widget.Button;  
import android.widget.ProgressBar;  
import android.widget.TextView;  
import java.util.Random;  
  
public class MessageActivity extends AppCompatActivity {  
  
 private ProgressBar pbFirst, pbSecond;  
 private TextView tvMsgWorking, tvMsgReturned;  
 private boolean isRunning;  
 private int MAX\_SEC = 100;  
 private int intTest;  
 private Thread bgThread;  
 private Handler handler;  
 private Button btnStart;  
  
 private static final int *MSG\_UPDATE* = 1;  
 private static final int *MSG\_STOPPED* = 2;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_message*);  
 findViewByIds();  
 initVariables();  
 setupHandler();  
  
 btnStart.setOnClickListener(v -> {  
 if (!isRunning) {  
 isRunning = true;  
 tvMsgWorking.setText(getString(R.string.*working*));  
 initBgThread();  
 }  
 });  
 }  
  
 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;  
 intTest = 0;  
 pbFirst.setMax(MAX\_SEC);  
 pbSecond.setIndeterminate(false);  
 }  
  
 private void setupHandler() {  
 handler = new Handler(Looper.*getMainLooper*()) {  
 @Override  
 public void handleMessage(Message msg) {  
 if (msg.what == *MSG\_UPDATE*) {  
 int randomValue = (Integer) msg.obj;  
 intTest++;  
 pbFirst.setProgress(Math.*min*(intTest, pbFirst.getMax()));  
 tvMsgReturned.setText(getString(R.string.*returned\_by\_bg\_thread*)  
 + "Random: " + randomValue  
 + getString(R.string.*global\_value\_seen*) + ": " + intTest);  
 } else if (msg.what == *MSG\_STOPPED*) {  
 tvMsgWorking.setText(getString(R.string.*done\_background\_thread\_has\_been\_stopped*));  
 isRunning = false;  
 }  
 }  
 };  
 }  
  
 private void initBgThread() {  
 bgThread = new Thread(() -> {  
 Random rnd = new Random();  
 while (isRunning && intTest < MAX\_SEC) {  
 int value = rnd.nextInt(101);  
 Message m = handler.obtainMessage(*MSG\_UPDATE*, value);  
 handler.sendMessage(m);  
 try {  
 Thread.*sleep*(500);  
 } catch (InterruptedException e) {  
 break;  
 }  
 }  
 handler.sendEmptyMessage(*MSG\_STOPPED*);  
 });  
 bgThread.start();  
 }  
  
 @Override  
 protected void onStop() {  
 super.onStop();  
 isRunning = false;  
 if (bgThread != null && bgThread.isAlive()) bgThread.interrupt();  
 }  
}

Bài 2: Viết ứng dụng MultiThread sử dụng Post

A screenshot of a phone

AI-generated content may be incorrect.

package com.example.lab6;  
  
import android.os.Bundle;  
import android.os.Handler;  
import android.view.View;  
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 PostActivity extends AppCompatActivity {  
  
 private ProgressBar pbWaiting;  
 private TextView tvTopCaption;  
 private EditText etInput;  
 private Button btnExecute, btnStop;  
  
 private int globalValue, accum;  
 private long startTime;  
 private final String PATIENCE = "\nSome important data is being collected now.\nPlease be patient...wait...";  
 private Handler handler;  
 private Runnable fgRunnable, bgRunnable;  
 private Thread testThread;  
 private boolean isRunning = false;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_post*);  
  
 findViewByIds();  
 initVariables();  
  
 btnExecute.setOnClickListener(v -> {  
 String text = etInput.getText().toString();  
 Toast.*makeText*(PostActivity.this, text, Toast.*LENGTH\_SHORT*).show();  
  
 if (!isRunning) {  
 isRunning = true;  
 testThread = new Thread(bgRunnable);  
 testThread.start();  
 }  
 });  
  
 btnStop.setOnClickListener(v -> {  
 if (isRunning) {  
 isRunning = false;  
 Toast.*makeText*(PostActivity.this, "Background work stopped!", Toast.*LENGTH\_SHORT*).show();  
 }  
 });  
 }  
  
 private void findViewByIds() {  
 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*);  
  
 btnStop = new Button(this);  
 btnStop.setText("STOP");  
 ((android.widget.LinearLayout) pbWaiting.getParent()).addView(btnStop);  
 }  
  
 private void initVariables() {  
 globalValue = 0;  
 accum = 0;  
 startTime = System.*currentTimeMillis*();  
 handler = new Handler();  
  
 fgRunnable = () -> {  
 tvTopCaption.setText("Global value: " + globalValue + " " + PATIENCE);  
 pbWaiting.setProgress(globalValue % 100);  
 };  
  
 bgRunnable = () -> {  
 while (isRunning) {  
 globalValue++;  
 handler.post(fgRunnable);  
 try {  
 Thread.*sleep*(1000);  
 } catch (InterruptedException e) {  
 e.printStackTrace();  
 }  
 }  
 handler.post(() -> tvTopCaption.setText("Background work is over!"));  
 };  
 }  
  
 @Override  
 protected void onStop() {  
 super.onStop();  
 isRunning = false;  
 }  
}

Bài 3: Viết ứng dụng sử dụng Asynctask

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package com.example.lab6;  
  
import android.os.Bundle;  
import android.widget.Button;  
import android.widget.TextView;  
import androidx.appcompat.app.AppCompatActivity;  
import java.text.SimpleDateFormat;  
import java.util.Date;  
  
public class AsyncActivity extends AppCompatActivity {  
  
 private Button btnQuickJob, btnSlowJob;  
 private TextView tvStatus;  
 private SlowTask slowTask;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_async*);  
 findViewByIds();  
  
 slowTask = new SlowTask(AsyncActivity.this, tvStatus);  
  
 btnQuickJob.setOnClickListener(v -> {  
 SimpleDateFormat sdf = new SimpleDateFormat("dd/MM/yyyy HH:mm:ss");  
 tvStatus.setText(sdf.format(new Date()));  
 });  
  
 btnSlowJob.setOnClickListener(v -> slowTask.execute());  
 }  
  
 private void findViewByIds() {  
 btnQuickJob = findViewById(R.id.*btn\_quick\_job*);  
 btnSlowJob = findViewById(R.id.*btn\_slow\_job*);  
 tvStatus = findViewById(R.id.*tv\_status*);  
 }  
  
 @Override  
 protected void onDestroy() {  
 super.onDestroy();  
 if (slowTask != null && !slowTask.isCancelled()) slowTask.cancel(true);  
 }  
}