Министерство образования Российской Федерации

Пензенский государственный университет

Кафедра "Вычислительной техники"

**ОТЧЁТ**

По лабораторной №7

по дисциплине "Графические интерфейсы Android и QT"

на тему "Обмен сообщениями из потоков в Android"

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**Задание:**

Измените способ работы с БД таким образом, чтобы запросы к БД выполнялись в отдельных потоках, создаваемых во внешнем, по отношению к DataBaseHandler и Activity классе.

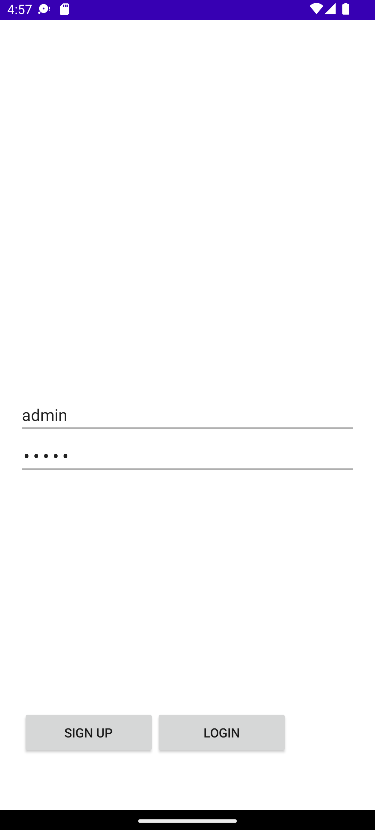


Рисунок 1. Результат работы программы

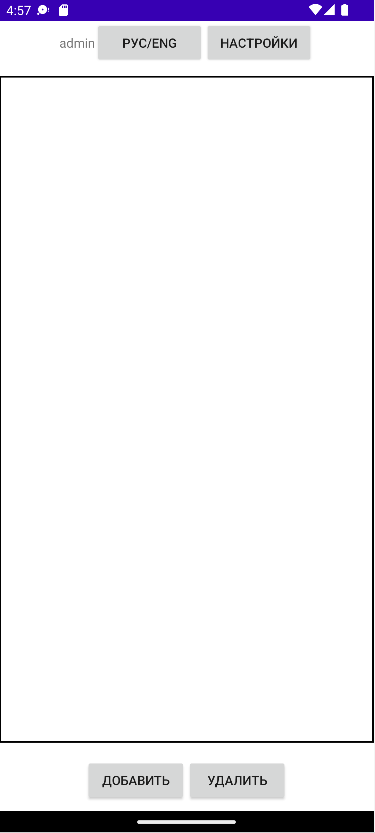


Рисунок 2. Результат работы программы

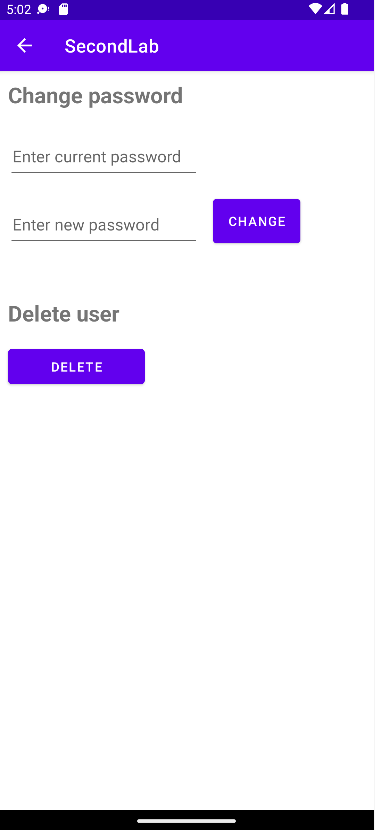


Рисунок 3. Результат работы программы

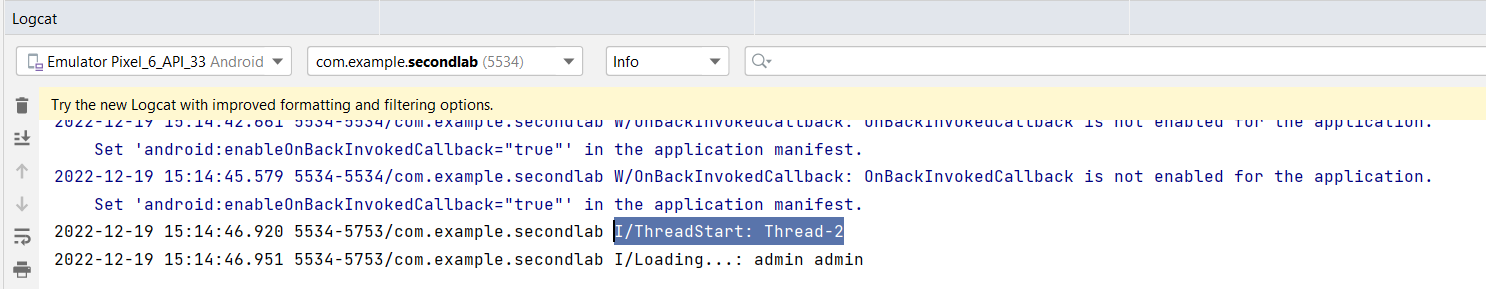


Рисунок 4. Результат работы программы

**Листинг:**

**AuthActivity**

**package** com.example.secondlab;  
  
**import** android.app.Activity;  
**import** android.content.Intent;  
**import** android.os.Bundle;  
**import** android.os.Handler;  
**import** android.os.Looper;  
**import** android.os.Message;  
**import** android.util.Log;  
**import** android.view.View;  
**import** android.widget.Button;  
**import** android.widget.EditText;  
**import** android.widget.TextView;  
**import** android.widget.Toast;  
  
**import** com.example.secondlab.db.User;  
**import** androidx.annotation.Nullable;  
**import** com.example.secondlab.db.DatabaseHandler;  
  
**public class** AuthActivity **extends** Activity {  
  
 *//DatabaseHandler db;* EditText **username**, **password**;  
  
 **final** Looper **looper** = Looper.*getMainLooper*();  
 **final** Handler **handler** = **new** Handler(**looper**) {  
 @Override  
 **public void** handleMessage(Message msg) {  
 **if** (msg.**sendingUid** == 1) {  
  
 String messageAdd = (String) msg.**obj**; *//добавление нового юзера* **if**(messageAdd.equals(**"Login available"**)){ *//еще не зареган* handleError(String.*format*(**"User %s is registered"**, **username**.getText().toString()));  
 }  
 **else**{  
 handleError(messageAdd); *//уже занят* }  
 }  
 **if**(msg.**sendingUid** == 2){  
 String data = (String) msg.**obj**;  
 signInApp(data);  
 }  
 }  
 };  
  
 @Override  
 **protected void** onCreate(@Nullable Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_auth***);  
 *//db = new DatabaseHandler(this);* **username** = (EditText)findViewById(R.id.***editText1***);  
 **password** = (EditText)findViewById(R.id.***editText2***);  
  
 Button buttonLogin = findViewById(R.id.***buttonLogin***);  
 Button buttonSignUp = findViewById(R.id.***buttonSingUp***);  
  
 buttonSignUp.setOnClickListener(**new** View.OnClickListener() {  
 @Override  
 **public void** onClick(View v) {  
  
 **new** HandlerThr(**handler**, AuthActivity.**this**).addUser(**new** User(**username**.getText().toString(), **password**.getText().toString()));  
 }  
 });  
 buttonLogin.setOnClickListener(**new** View.OnClickListener() {  
 @Override  
 **public void** onClick(View v) {  
 **if** (**username**.getText().toString().length() == 0 || **password**.getText().toString().length() == 0){  
 handleError(**"Fill all fields"**); *//заполните* } **else** {  
 handleError(**""**);  
 **new** HandlerThr(**handler**, AuthActivity.**this**).getUser(**username**.getText().toString());  
 }  
 }  
 });  
 **username**.setOnFocusChangeListener(**new** View.OnFocusChangeListener() {  
 @Override  
 **public void** onFocusChange(View view, **boolean** b) {  
 handleError(**""**);  
 }  
 });  
 }  
  
 **public void** handleError (String message) {  
 TextView errorText = findViewById(R.id.***errorText***);  
 errorText.setText(message);  
 }  
  
 **public void** signInApp (String data) {  
 **int** condition = 0;  
 String thisLoginUser = **username**.getText().toString();  
 String passCmp= **password**.getText().toString();  
  
 String dataUser = data;  
  
 **if**(!dataUser.equals(**"null"**)){  
 String[] cmpData = dataUser.split(**" "**);  
  
 **if**(cmpData[0].equals(thisLoginUser)){  
 Log.*e*(**"cmplog"**, cmpData[0]);  
 condition += 1;  
 }**else**{  
 handleError(**"Wrong username"**);  
 condition = 0;  
 }  
  
 **if** (cmpData[1].equals(passCmp)){  
 Log.*e*(**"cmppass"**, cmpData[1]);  
 condition += 1;  
 }**else**{  
 handleError(**"Wrong password"**);  
 condition = 0;  
 }  
  
 **if**(condition == 2){  
 handleError(**""**);  
 Intent intent = **new** Intent(**this**, ListActivity.**class**);  
 intent.putExtra(**"username"**, cmpData[0]);  
 intent.putExtra(**"password"**, cmpData[1]);  
 **username**.setText(**""**);  
 **password**.setText(**""**);  
 startActivity(intent);  
 }  
 Log.*e*(**"cmp"**, cmpData[0] +**" "**+ cmpData[1]);  
 }  
 **else**{  
 handleError(**"User not found"**);  
 }  
 }  
}

**ListActivity**

**package** com.example.secondlab;  
  
**import** android.app.Activity;  
**import** android.content.Intent;  
**import** android.os.Bundle;  
**import** android.view.View;  
**import** android.widget.ArrayAdapter;  
**import** android.widget.Button;  
**import** android.widget.ListView;  
**import** android.widget.TextView;  
  
**import** androidx.annotation.Nullable;  
  
**import** java.util.ArrayList;  
  
**public class** ListActivity **extends** Activity {  
 **int clickCounter** = 0;  
 String **addEng** = **"Add"**;  
 String **addRus** = **"Добавить"**;  
 String **removeEng** = **"Remove"**;  
 String **removeRus** = **"Удалить"**;  
 String **settingsEng** = **"Settings"**;  
 String **settingsRus** = **"Настройки"**;  
 **boolean isRus** = **true**;  
  
 String **username**, **password**;  
 @Override  
 **protected void** onCreate(@Nullable Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_list***);  
  
 ArrayList<String> myStringArray = **new** ArrayList<String>();  
 ArrayAdapter<String> TextAdapter = **new** ArrayAdapter(**this**, android.R.layout.***simple\_list\_item\_1***, myStringArray);  
 ListView textList = findViewById(R.id.***textList***);  
 textList.setAdapter(TextAdapter);  
  
 Button buttonLang = findViewById(R.id.***buttonLang***);  
 Button buttonAdd = findViewById(R.id.***buttonAdd***);  
 Button buttonRemove = findViewById(R.id.***buttonRemove***);  
 Button buttonSettings = findViewById(R.id.***buttonSettings***);  
 TextView usernameTitle = findViewById(R.id.***username***);  
  
 Bundle extras = getIntent().getExtras();  
 **if** (extras != **null**) {  
 **username** = extras.getString(**"username"**);  
 **password** = extras.getString(**"password"**);  
 usernameTitle.setText(**username**);  
 }  
  
 buttonAdd.setText(**addRus**);  
 buttonRemove.setText(**removeRus**);  
 buttonSettings.setText(**settingsRus**);  
  
 buttonLang.setOnClickListener(**new** View.OnClickListener() {  
 @Override  
 **public void** onClick(View v) {  
 **if** (**isRus**) {  
 buttonAdd.setText(**addEng**);  
 buttonRemove.setText(**removeEng**);  
 buttonSettings.setText(**settingsEng**);  
 **isRus** = **false**;  
 } **else** {  
 buttonAdd.setText(**addRus**);  
 buttonRemove.setText(**removeRus**);  
 buttonSettings.setText(**settingsRus**);  
 **isRus** = **true**;  
 }  
 }  
 });  
 buttonAdd.setOnClickListener(**new** View.OnClickListener() {  
 @Override  
 **public void** onClick(View v) {  
 myStringArray.add(**"Clicked : "**+**clickCounter**++);  
 TextAdapter.notifyDataSetChanged();  
 }  
 });  
 buttonRemove.setOnClickListener(**new** View.OnClickListener() {  
 @Override  
 **public void** onClick(View v) {  
 **int** lastItemPosition = myStringArray.size() - 1;  
 **if** (lastItemPosition >= 0) {  
 myStringArray.remove(myStringArray.size() - 1);  
 TextAdapter.notifyDataSetChanged();  
 }  
 }  
 });  
 buttonSettings.setOnClickListener(**new** View.OnClickListener() {  
 @Override  
 **public void** onClick(View view) {  
 goToSettings();  
 }  
 });  
 }  
  
 **public void** goToSettings () {  
 Intent intent = **new** Intent(**this**, SettingsActivity.**class**);  
 intent.putExtra(**"username"**, **username**);  
 intent.putExtra(**"password"**, **password**);  
 startActivity(intent);  
 }  
}

**SettingsActivity**

**package** com.example.secondlab;  
  
**import** androidx.appcompat.app.AppCompatActivity;  
  
**import** android.content.Intent;  
**import** android.content.SharedPreferences;  
**import** android.os.Bundle;  
**import** android.util.Log;  
**import** android.view.View;  
**import** android.widget.Button;  
**import** android.widget.EditText;  
**import** android.widget.TextView;  
  
**import** com.example.secondlab.db.DatabaseHandler;  
**import** com.example.secondlab.db.User;  
  
**public class** SettingsActivity **extends** AppCompatActivity **implements** View.OnClickListener{  
  
 Button **settingEditBut**, **settingDelBut**;  
 EditText **oldPass**, **newPass**;  
 DatabaseHandler **db**;  
 String **username**, **password**;  
  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_settings***);  
  
 **db** = **new** DatabaseHandler(**this**);  
  
 **oldPass** = findViewById(R.id.***oldPass***);  
 **newPass** = findViewById(R.id.***newPass***);  
 **settingDelBut** = findViewById(R.id.***settingDelBut***);  
 **settingEditBut** = findViewById(R.id.***settingEditBut***);  
  
 **settingEditBut**.setOnClickListener(**this**);  
 **settingDelBut**.setOnClickListener(**this**);  
  
 Bundle extras = getIntent().getExtras();  
 String usernameDB = extras.get(**"username"**).toString();  
 String passDB = extras.get(**"password"**).toString();  
  
 **username** = usernameDB;  
 **password** = passDB;  
 }  
  
 @Override  
 **public void** onClick (View view) {  
 **switch** (view.getId()){  
 **case** R.id.***settingEditBut***:  
 updatePass();  
 **break**;  
 **case** R.id.***settingDelBut***:  
 deleteUserPref();  
 **break**;  
 **default**:  
 **break**;  
 }  
 }  
  
 **public void** updatePass () {  
 String passwordNew = **newPass**.getText().toString();  
  
 **if**(**password**.equals(**oldPass**.getText().toString())) {  
 **db**.updatePassword(**username**, passwordNew);  
 handleError(**"Password successfully changed"**);  
 Intent intent = **new** Intent(SettingsActivity.**this**, AuthActivity.**class**);  
 startActivity(intent);  
 } **else** {  
 handleError(**"Wrong current password"**);  
 }  
 }  
 **public void** deleteUserPref () {  
 **db**.deleteUser(**username**);  
  
 Intent intent = **new** Intent(SettingsActivity.**this**, AuthActivity.**class**);  
 startActivity(intent);  
 }  
 **public void** handleError (String message) {  
 TextView errorText = findViewById(R.id.***errorText***);  
 errorText.setText(message);  
 }  
  
}

**HandlerThr**

**package** com.example.secondlab;  
  
**import** android.content.Context;  
**import** android.os.Handler;  
**import** android.os.Message;  
**import** android.util.Log;  
  
**import** com.example.secondlab.db.DatabaseHandler;  
**import** com.example.secondlab.db.User;  
  
**public class** HandlerThr {  
 Handler **t\_handler**;  
 **final** Message **message** = Message.*obtain*();  
 Context **context**;  
  
 HandlerThr(Handler handler, Context context){  
 **this**.**t\_handler** = handler;  
 **this**.**context** = context;  
 }  
  
 DatabaseHandler **db**;  
  
 **public void** addUser(User user){  
 **new** Thread(() -> {  
 Log.*i*(**"Thread"**, Thread.*currentThread*().getName());  
 **db** = **new** DatabaseHandler(**context**);  
 String messageAdd = **db**.addUser(user);  
 **message**.**sendingUid** = 1;  
 **message**.**obj** = messageAdd;  
 **t\_handler**.sendMessage(**message**);  
 }).start();  
 }  
 **public void** getUser(String log){  
 **new** Thread(() -> {  
 Log.*i*(**"Thread"**, Thread.*currentThread*().getName());  
 **db** = **new** DatabaseHandler(**context**);  
 String loginData = **db**.getUser(log);  
  
 **message**.**sendingUid** = 2;  
 **message**.**obj** = loginData;  
 **t\_handler**.sendMessage(**message**);  
 }).start();  
 }  
 **public void** updPass(String log, String pass){  
 **new** Thread(() -> {  
 Log.*i*(**"Thread"**, Thread.*currentThread*().getName());  
 **db** = **new** DatabaseHandler(**context**);  
 String messageUpd = **db**.updatePassword(log, pass);  
 **message**.**sendingUid** = 3;  
 **message**.**obj** = messageUpd;  
 **t\_handler**.sendMessage(**message**);  
 }).start();  
 }  
 **public void** delUser(String log){  
 **new** Thread(() -> {  
 Log.*i*(**"Thread"**, Thread.*currentThread*().getName());  
 **db** = **new** DatabaseHandler(**context**);  
 String messageUpd = **db**.deleteUser(log);  
 **message**.**sendingUid** = 4;  
 **message**.**obj** = messageUpd;  
 **t\_handler**.sendMessage(**message**);  
 }).start();  
 }  
}

**Верстка:**

**Activity\_auth**

*<?***xml version="1.0" encoding="utf-8"***?>*<**FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:paddingHorizontal="20dp"**>  
 <**EditText  
 android:id = "@+id/editText1"  
 android:layout\_width = "match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center\_vertical"  
 android:hint="Login"** />  
 <**EditText  
 android:id = "@+id/editText2"  
 android:layout\_width = "match\_parent"  
 android:layout\_height="wrap\_content"  
 android:inputType = "textPassword"  
 android:layout\_marginTop="45dp"  
 android:hint="Password"  
 android:layout\_gravity="center\_vertical"** />  
 <**TextView  
 android:id = "@+id/errorText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="bottom"  
 android:layout\_marginBottom="30dp"  
 android:textColor="@color/design\_default\_color\_error"** />  
 <**Button  
 android:id = "@+id/buttonLogin"  
 android:layout\_width = "wrap\_content"  
 android:layout\_height = "wrap\_content"  
 android:text = "Login"  
 android:layout\_marginBottom="60dp"  
 android:layout\_gravity="bottom"  
 android:layout\_marginLeft="50pt"** />  
</**FrameLayout**>

**Activity\_list**

*<?***xml version="1.0" encoding="utf-8"***?>*<**FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"**>  
 <**LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="horizontal"  
 android:layout\_gravity="top"  
 android:gravity="center\_horizontal"  
 android:layout\_marginBottom="10dp"**>  
 <**TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:id="@+id/username"**>  
 </**TextView**>  
 <**Button  
 android:id="@+id/buttonLang"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="top"  
 android:layout\_marginStart="100pt"  
 android:text="Рус/Eng"**/>  
 </**LinearLayout**>  
  
 <**include layout="@layout/list"**/>  
  
 <**LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="horizontal"  
 android:layout\_gravity="bottom"  
 android:gravity="center\_horizontal"  
 android:layout\_marginBottom="10dp"**>  
 <**Button  
 android:id="@+id/buttonAdd"  
 android:layout\_width="50pt"  
 android:layout\_height="wrap\_content"** />  
  
 <**Button  
 android:id="@+id/buttonRemove"  
 android:layout\_width="50pt"  
 android:layout\_height="wrap\_content"** />  
 </**LinearLayout**>  
  
</**FrameLayout**>

**Activity\_settings**

*<?***xml version="1.0" encoding="utf-8"***?>*<**LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"**>  
  
 <**TextView  
 android:layout\_width="match\_parent"  
 android:layout\_height="40dp"  
 android:layout\_margin="10dp"  
 android:fontFamily="sans-serif"  
 android:text="Change password"  
 android:textAlignment="viewStart"  
 android:textAllCaps="false"  
 android:textSize="24sp"  
 android:textStyle="bold"** />  
  
 <**EditText  
 android:id="@+id/oldPass"  
 android:layout\_width="210dp"  
 android:layout\_height="50dp"  
 android:layout\_margin="10dp"  
 android:hint="Enter current password"  
 android:paddingStart="5dp"  
 android:paddingTop="8dp"** />  
 <**LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="horizontal"**>  
  
 <**EditText  
 android:id="@+id/newPass"  
 android:layout\_width="210dp"  
 android:layout\_height="50dp"  
 android:layout\_margin="10dp"  
 android:hint="Enter new password"  
 android:paddingStart="5dp"  
 android:paddingTop="8dp"  
 android:autofillHints="password"** />  
  
 <**Button  
 android:id="@+id/settingEditBut"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="60dp"  
 android:layout\_margin="5dp"  
 android:text="Change"** />  
 </**LinearLayout**>  
 <**TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:id="@+id/errorText"  
 android:textColor="@color/design\_default\_color\_error"  
 android:layout\_marginBottom="20dp"  
 android:layout\_marginLeft="10dp"** />  
 <**TextView  
 android:layout\_width="match\_parent"  
 android:layout\_height="40dp"  
 android:layout\_margin="10dp"  
 android:fontFamily="sans-serif"  
 android:text="Delete user"  
 android:textAlignment="viewStart"  
 android:textSize="24sp"  
 android:textStyle="bold"**/>  
  
 <**Button  
 android:id="@+id/settingDelBut"  
 android:layout\_width="150dp"  
 android:layout\_height="50dp"  
 android:layout\_marginStart="10dp"  
 android:text="Delete"** />  
  
</**LinearLayout**>

Вывод: в ходе выполнения лабораторной работы мы разработали простейшее Android приложение.