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«Национальный исследовательский университет   
«Высшая школа экономики»

*Факультет экономики, менеджмента и бизнес-информатики*

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**ПРОЕКТ 2**

*Отчет*

студента образовательной программы «Программная инженерия»

по направлению подготовки *09.03.04 Программная инженерия*

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А.В. Яборов

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# **Постановка задачи**

1. Использовать разрешения для доступа к камере, чтобы добавить аватар пользователя. Если ранее картинку сохранили, то показывать ее при открытии экрана;
2. Использовать параметры датчика освещённости и вывести в настройках динамическое значение освещённости;
3. Доработать работу с полем name. Сохранять его в преференсы и считывать при открытии экрана по аналогии с работой с путем до фото;
4. Вывести в настройках список всех доступных датчиков;

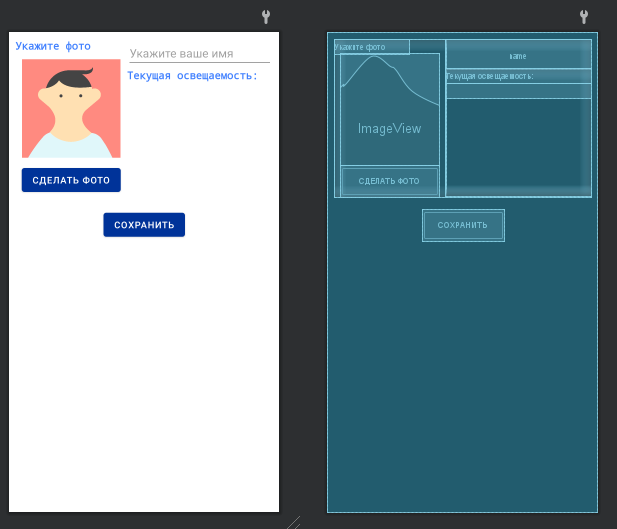
# **1 Задание**

Задача: Использовать разрешения для доступа к камере, чтобы добавить аватар пользователя. Если ранее картинку сохранили, то показывать ее при открытии экрана.

Создаем новый экран activity\_settings:

<?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:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
  
 <LinearLayout  
 android:id="@+id/linearLayout3"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 android:orientation="horizontal"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent">  
  
 <LinearLayout  
 android:layout\_width="170dp"  
 android:layout\_height="wrap\_content"  
 android:orientation="vertical">  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/textView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="@string/photo\_textView" />  
  
 <ImageView  
 android:id="@+id/photo"  
 android:layout\_width="150dp"  
 android:layout\_height="170dp"  
 android:layout\_gravity="center"  
 android:contentDescription="@string/user\_avatar"  
 tools:srcCompat="@tools:sample/avatars" />  
  
 <Button  
 android:id="@+id/button\_photo"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center"  
 android:text="@string/take\_photo\_button\_ru" />  
 </LinearLayout>  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:gravity="center"  
 android:orientation="vertical">  
  
 <EditText  
 android:id="@+id/name"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:ems="10"  
 android:inputType="textPersonName"  
 android:hint="@string/name\_editView"  
 android:autofillHints="" />  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical">  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/textView2"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/light\_textView" />  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/sensor\_light"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="00 lux" />  
 </LinearLayout>  
 </LinearLayout>  
 </LinearLayout>  
  
 <Button  
 android:id="@+id/button\_save"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="160dp"  
 android:layout\_marginLeft="160dp"  
 android:layout\_marginTop="20dp"  
 android:layout\_marginEnd="160dp"  
 android:layout\_marginRight="160dp"  
 android:text="@string/save\_button\_ru"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout3" />  
</androidx.constraintlayout.widget.ConstraintLayout>

Добавляем кнопку на главный экран (изменения выделены красным):

<?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:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
  
 <ImageView  
 android:id="@+id/Logo"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="25dp"  
 android:layout\_marginLeft="25dp"  
 android:layout\_marginTop="20dp"  
 android:layout\_marginEnd="25dp"  
 android:layout\_marginRight="25dp"  
 android:layout\_marginBottom="80dp"  
 android:gravity="center\_horizontal"  
 android:orientation="vertical"  
 android:scaleX="1.3"  
 android:scaleY="1.3"  
 app:layout\_constraintBottom\_toTopOf="@+id/button\_student"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:srcCompat="@drawable/logo" />  
  
 <Button  
 android:id="@+id/button\_student"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="55dp"  
 android:layout\_marginLeft="55dp"  
 android:layout\_marginEnd="55dp"  
 android:layout\_marginRight="55dp"  
 android:layout\_marginBottom="20dp"  
 android:gravity="center\_horizontal"  
 android:maxLines="1"  
 android:text="@string/student\_button\_ru"  
 android:textAppearance="@style/TextAppearance.AppCompat.Medium"  
 app:layout\_constraintBottom\_toTopOf="@+id/button\_teacher"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.0"  
 app:layout\_constraintStart\_toStartOf="parent" />  
  
 <Button  
 android:id="@+id/button\_teacher"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="31dp"  
 android:layout\_marginLeft="31dp"  
 android:layout\_marginEnd="31dp"  
 android:layout\_marginRight="31dp"  
 android:layout\_marginBottom="20dp"  
 android:gravity="center"  
 android:maxLines="1"  
 android:text="@string/teacher\_button\_ru"  
 android:textAppearance="@style/TextAppearance.AppCompat.Medium"  
 app:layout\_constraintBottom\_toTopOf="@+id/button\_settings"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.0"  
 app:layout\_constraintStart\_toStartOf="parent" />  
  
 <Button  
 android:id="@+id/button\_settings"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="160dp"  
 android:layout\_marginLeft="160dp"  
 android:layout\_marginEnd="160dp"  
 android:layout\_marginRight="160dp"  
 android:layout\_marginBottom="40dp"  
 android:gravity="center"  
 android:maxLines="1"  
 android:text="@string/settings\_ru"  
 android:textAppearance="@style/TextAppearance.AppCompat.Medium"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent" />  
</androidx.constraintlayout.widget.ConstraintLayout>

***Рисунок 1.1 – Результат***

Добавляем выполнение по нажатию на кнопку в MainActivity (изменения выделены красным):

package org.hse.android;  
  
import androidx.appcompat.app.AppCompatActivity;  
import android.content.Intent;  
import android.os.Bundle;  
import android.view.View;  
import java.util.Objects;  
  
public class MainActivity extends AppCompatActivity {  
  
 private static final String *TAG* = "MainActivity";  
  
 @Override protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 Objects.*requireNonNull*(getSupportActionBar()).hide();  
  
 View button\_student = findViewById(R.id.*button\_student*);  
 View button\_teacher = findViewById(R.id.*button\_teacher*);  
 View button\_settings = findViewById(R.id.*button\_settings*);  
  
 button\_student.setOnClickListener(v -> Student\_pressed());  
 button\_teacher.setOnClickListener(v -> Teacher\_pressed());  
 button\_settings.setOnClickListener(v -> Settings\_pressed());  
 }  
  
 private void Student\_pressed(){  
 Intent intent = new Intent(MainActivity.this, StudentActivity.class);  
 startActivity(intent);  
 }  
  
 private void Teacher\_pressed(){  
 Intent intent = new Intent(MainActivity.this, TeacherActivity.class);  
 startActivity(intent);  
 }  
  
 private void Settings\_pressed(){  
 Intent intent = new Intent(MainActivity.this, SettingsActivity.class);  
 startActivity(intent);  
 }  
}

Прописываем разрешения и provider в AndroidManifest (изменения выделены красным):

<?xml version="1.0" encoding="utf-8"?>  
<manifest xmlns:android="http://schemas.android.com/apk/res/android"  
 package="org.hse.android">  
  
 <!-- <uses-permission android:name="android.permission.BLUETOOTH"/> -->  
 <!-- <uses-permission android:name="android.permission.BLUETOOTH\_ADMIN"/> -->  
 <uses-permission android:name="android.permission.CAMERA" />  
 <uses-permission android:name="android.permission.READ\_EXTERNAL\_STORAGE" />  
 <uses-permission android:name="android.permission.INTERNET" />  
 <uses-permission android:name="android.permission.ACCESS\_NETWORK\_STATE" />  
 <uses-permission android:name="android.permission.WRITE\_EXTERNAL\_STORAGE" />  
  
 <uses-feature  
 android:name="android.hardware.camera"  
 android:required="true" />  
  
 <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/Theme.HSE">  
 <meta-data  
 android:name="com.google.android.actions"  
 android:resource="@xml/file\_paths" />  
  
 <activity android:name=".MainActivity">  
 <intent-filter>  
 <action android:name="android.intent.action.MAIN" />  
  
 <category android:name="android.intent.category.LAUNCHER" />  
 </intent-filter>  
 </activity>  
 <activity android:name=".StudentActivity" />  
 <activity android:name=".TeacherActivity" />  
 <activity android:name=".SettingsActivity" />  
  
 <provider  
 android:name="androidx.core.content.FileProvider"  
 android:authorities="org.hse.android.provider"  
 android:exported="false"  
 android:grantUriPermissions="true">  
 <meta-data  
 android:name="android.support.FILE\_PROVIDER\_PATHS"  
 android:resource="@xml/file\_paths" />  
 </provider>  
 </application>  
</manifest>

Прописываем путь для файлов в созданном файле file\_path.xml:

<?xml version="1.0" encoding="utf-8"?>  
<paths>  
 <files-path  
 name="files"  
 path="external\_files">  
 </files-path>  
</paths>

Добавляем обработчик события нажатия на кнопку создания изображения:

View buttonPhoto = findViewById(R.id.*button\_photo*);  
buttonPhoto.setOnClickListener(v -> checkPermission());

Для создания фото сначала проверяем разрешения:

public void checkPermission(){  
 int permissionsCheck = ActivityCompat.*checkSelfPermission*(this, *PERMISSION*);  
 if (permissionsCheck != PackageManager.*PERMISSION\_GRANTED*) {  
 if(ActivityCompat.*shouldShowRequestPermissionRationale*(this, *PERMISSION*)) {  
 AlertDialog.Builder builder = new AlertDialog.Builder(this);  
 builder.setTitle("Нужно предоставить права")  
 .setMessage("Для снятия фото нужно предоставить права на фото")  
 .setPositiveButton(android.R.string.*ok*, (dialog, id) ->  
 requestPermissions(*PERMISSION*, *REQUEST\_PERMISSION\_CODE*));  
 builder.create().show();  
 }  
 else { requestPermissions(*PERMISSION*, *REQUEST\_PERMISSION\_CODE*); }  
 }  
 else { dispatchTakePictureIntent(); }  
}

При отсутствии разрешений запрашиваем их:

private void requestPermissions(String permissionName, int permissionRequestCode) {  
 ActivityCompat.*requestPermissions*(this, new String[]{permissionName}, permissionRequestCode);  
}

При их наличии делаем фото:

@SuppressLint("QueryPermissionsNeeded")  
private void dispatchTakePictureIntent() {  
 Intent takePictureIntent = new Intent(MediaStore.*ACTION\_IMAGE\_CAPTURE*);  
 if(takePictureIntent.resolveActivity(getPackageManager()) != null) {  
 //Create a file to store the image  
 File photoFile = null;  
 try { photoFile = createImageFile(); }  
 catch (IOException ex) { Log.*e*(*TAG*, "Create file", ex); }  
 if(photoFile != null) {  
 Uri photoURI = FileProvider.*getUriForFile*(this, BuildConfig.*APPLICATION\_ID* + ".provider", photoFile);  
 takePictureIntent.putExtra(MediaStore.*EXTRA\_OUTPUT*,  
 photoURI);  
 try { startActivityForResult(takePictureIntent, *REQUEST\_IMAGE\_CAPTURE*); }  
 catch (ActivityNotFoundException e) { Log.*e*(*TAG*, "Start activity", e); }  
 }  
 }  
 loadPhoto();  
}

Сохраняем и получаем путь к файлу:

private File createImageFile() throws IOException {  
 String timeStamp = new SimpleDateFormat("yyyyMMdd\_HHmmss", Locale.*getDefault*()).format(new Date());  
 String imageFileName = "IMG\_" + timeStamp + "\_";  
  
 imagePath = new File(getFilesDir(), "external\_files");  
 imagePath.mkdir();  
 image = new File(imagePath.getPath(), String.*format*("%s.img", imageFileName));  
 return image;  
}

Возвращаемся к экрану.

Добавляем Обработчик события при нажатии на кнопку сохранения:

View buttonSave = findViewById(R.id.*button\_save*);  
buttonSave.setOnClickListener(v -> {  
 loadPhoto();  
 if(photo\_changed) {  
 preferenceManager.saveValue("photo", image.getPath());  
}

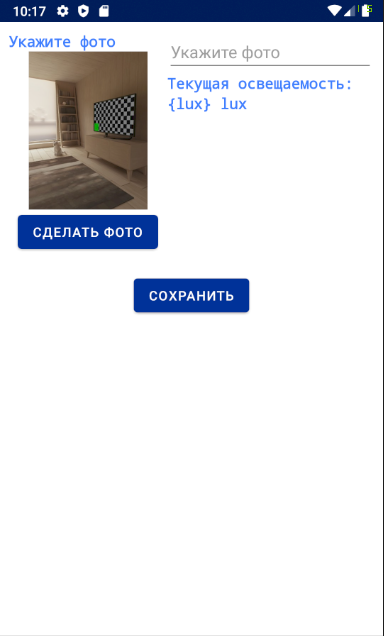
Toast.*makeText*(SettingsActivity.this, "Фото сохранено", Toast.*LENGTH\_SHORT*).show();  
});

Для чего загружаем фото в преференсы и отображаем само фото:

private void loadPhoto() { if(image != null) Glide.*with*(this).load(image).into(photo); }

package org.hse.android;  
  
import android.content.Context;  
import android.content.SharedPreferences;  
  
public class PreferenceManager {  
 private final static String *PREFERENCE\_FILE* = "org.hse.android.file";  
 private final SharedPreferences sharedPref;  
  
 public PreferenceManager(Context context) {  
 sharedPref = context.getSharedPreferences(*PREFERENCE\_FILE*, Context.*MODE\_PRIVATE*);  
 }  
  
 ///////////////////////  
  
 public void savePhotoValue(String key, String value) {  
 SharedPreferences.Editor editor = sharedPref.edit();  
 editor.putString(key, value);  
 editor.apply();  
 }  
  
 public String getPhotoValue(String key) {  
 return sharedPref.getString(key, "");  
 }  
  
 private void saveValue(String key, String value) {  
 SharedPreferences.Editor editor = sharedPref.edit();  
 editor.putString(key, value);  
 editor.apply();  
 }  
  
 private String getValue(String key, String defaultValue) {  
 return sharedPref.getString(key,defaultValue);  
 }  
}

При паузе и продолжении проверяем наличие фото:

@Override  
protected void onResume() {  
 super.onResume();  
  
 File imgFile = new File(preferenceManager.getPhotoValue("photo"));  
 if (imgFile.exists()) { Glide.*with*(this).load(imgFile).into(photo); }  
 else { photo.setImageResource(R.drawable.*no\_image*); }  
  
 sensorManager.registerListener(this, light, SensorManager.*SENSOR\_DELAY\_NORMAL*);  
}  
  
@Override  
protected void onPause() {  
 super.onPause();  
  
 File imgFile = new File(preferenceManager.getPhotoValue("photo"));  
 if(imgFile.exists()){ Glide.*with*(this).load(imgFile).into(photo); }  
 else{ photo.setImageResource(R.drawable.*no\_image*); }  
  
 sensorManager.unregisterListener(this);  
}

***Рисунок 1.2 – Результат***

# **2 Задание**

Задача: Использовать параметры датчика освещённости и вывести в настройках динамическое значение освещённости.

Расширяем класс SettingsActivity:

public class SettingsActivity extends AppCompatActivity implements SensorEventListener { . . . }

Объявляем сенсоры:

private SensorManager sensorManager;  
private Sensor light;  
private TextView sensorLight;

. . .

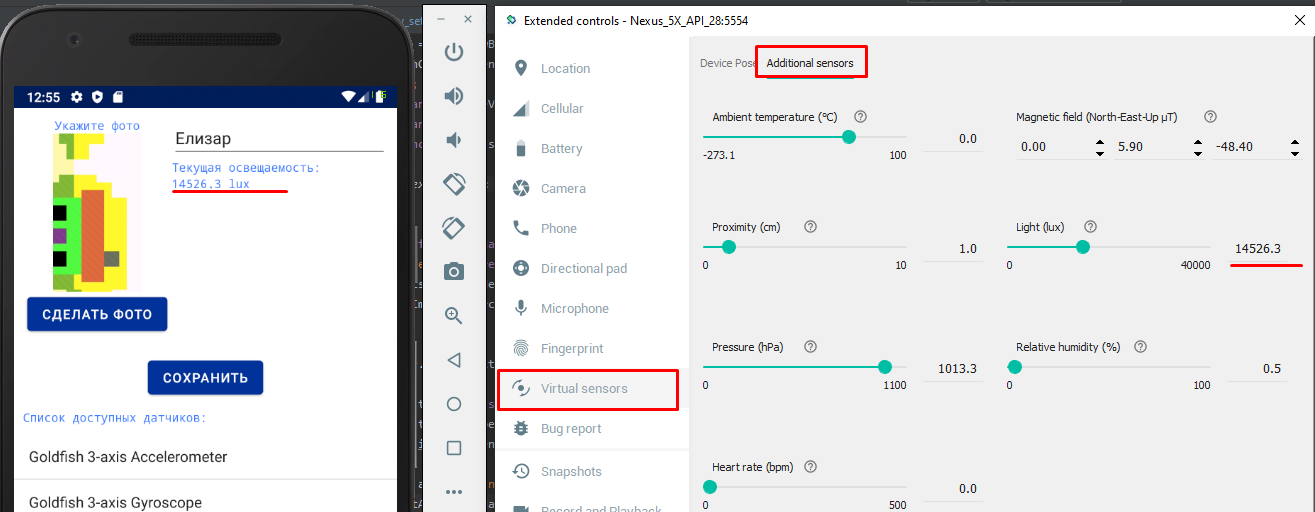
sensorLight = findViewById(R.id.*sensor\_light*);  
sensorManager = (SensorManager) getSystemService(Context.*SENSOR\_SERVICE*);  
light = sensorManager.getDefaultSensor(Sensor.*TYPE\_LIGHT*);

Добавляем код который будет обновлять данные с датчика:

public final void onAccuracyChanged(Sensor sensor, int accuracy) { }  
  
public final void onSensorChanged(SensorEvent event) {  
 float lux = event.values[0];  
 sensorLight.setText(String.*format*("%s lux", lux));  
}

На паузу и продолжение работы приложения так же добавляем код для экономии ресурсов:

@Override  
protected void onResume() {  
 super.onResume();  
  
 name.setText(preferenceManager.getValue("name"));  
  
 File imgFile = new File(preferenceManager.getValue("photo"));  
 if (imgFile.exists()) { Glide.*with*(this).load(imgFile).into(photo); }  
 else { photo.setImageResource(R.drawable.*no\_image*); }  
  
 sensorManager.registerListener(this, light, SensorManager.*SENSOR\_DELAY\_NORMAL*);  
}  
  
@Override  
protected void onPause() {  
 super.onPause();  
  
 name.setText(preferenceManager.getValue("name"));  
  
 File imgFile = new File(preferenceManager.getValue("photo"));  
 if(imgFile.exists()){ Glide.*with*(this).load(imgFile).into(photo); }  
 else{ photo.setImageResource(R.drawable.*no\_image*); }  
  
 sensorManager.unregisterListener(this);  
}



***Рисунок 2.1 – Результат***

# **3 Задание**

Задача: Доработать работу с полем name. Сохранять его в преференсы и считывать при открытии экрана по аналогии с работой с путем до фото.

Добавляем сохранение имени по нажатию на кнопку сохранения (изменения выделены красным цветом):

View buttonSave = findViewById(R.id.*button\_save*);  
buttonSave.setOnClickListener(v -> {  
 loadPhoto();  
 preferenceManager.saveValue("name", name.getText().toString());  
 if(photo\_changed) {  
 preferenceManager.saveValue("photo", image.getPath());  
 }  
 Toast.*makeText*(SettingsActivity.this, "Данные сохранены", Toast.*LENGTH\_SHORT*).show();  
});

Так же при запуске добавляем загрузку:

name.setText(preferenceManager.getValue("name"));

Аналогично для паузы и продолжения работы приложения

***Рисунок 3.1 – Результат***

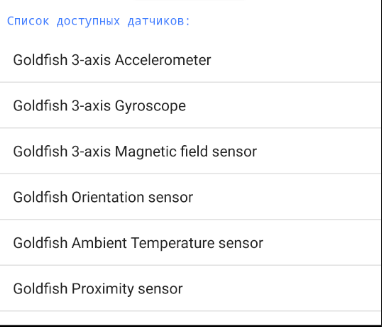
# **4 Задание**

Задача: Вывести в настройках список всех доступных датчиков.

Добавляем ListView на экран:

<ListView  
 android:id="@+id/sensors\_list"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="300dp"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/sensors\_list\_label">  
</ListView>

Заполняем лист в цикле и выводим через адаптер:

if(sensorManager.getDefaultSensor(Sensor.*TYPE\_LIGHT*) == null) { sensorLight.setText("Нет датчика освещенности"); }  
  
List<Sensor> listSensor = sensorManager.getSensorList(Sensor.*TYPE\_ALL*);  
List<String> listSensorType = new ArrayList<>();  
for (int i = 0; i < listSensor.size(); i++) { listSensorType.add(listSensor.get(i).getName()); }  
  
ArrayAdapter<?> adapter = new ArrayAdapter<>(this, android.R.layout.*simple\_list\_item\_1*, listSensorType);  
sensors\_list.setAdapter(adapter);

***Рисунок 4.1 – Результат***

# **Приложение А. Листинг «MainActivity»**

package org.hse.android;  
  
import androidx.appcompat.app.AppCompatActivity;  
import android.content.Intent;  
import android.os.Bundle;  
import android.util.Log;  
import android.view.View;  
import java.util.Objects;  
  
public class MainActivity extends AppCompatActivity {  
  
 private static final String *TAG* = "MainActivity";  
  
 @Override protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 Objects.*requireNonNull*(getSupportActionBar()).hide();  
  
 View button\_student = findViewById(R.id.*button\_student*);  
 View button\_teacher = findViewById(R.id.*button\_teacher*);  
 View button\_settings = findViewById(R.id.*button\_settings*);  
   
 Log.*d*(*TAG*, "Startup");  
  
 button\_student.setOnClickListener(v -> Student\_pressed());  
 button\_teacher.setOnClickListener(v -> Teacher\_pressed());  
 button\_settings.setOnClickListener(v -> Settings\_pressed());  
 }  
  
 private void Student\_pressed(){  
 Intent intent = new Intent(MainActivity.this, StudentActivity.class);  
 startActivity(intent);  
 }  
  
 private void Teacher\_pressed(){  
 Intent intent = new Intent(MainActivity.this, TeacherActivity.class);  
 startActivity(intent);  
 }  
  
 private void Settings\_pressed(){  
 Intent intent = new Intent(MainActivity.this, SettingsActivity.class);  
 startActivity(intent);  
 }  
}

# **Приложение Б. Листинг «StudentActivity»**

package org.hse.android;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.annotation.SuppressLint;  
import android.os.Bundle;  
import android.util.Log;  
import android.view.View;  
import android.widget.AdapterView;  
import android.widget.ArrayAdapter;  
import android.widget.Spinner;  
import android.widget.TextView;  
import java.text.DateFormatSymbols;  
import java.text.SimpleDateFormat;  
import java.util.ArrayList;  
import java.util.Date;  
import java.util.List;  
import java.util.Locale;  
import java.util.Objects;  
  
public class StudentActivity extends AppCompatActivity {  
  
 private static final String *TAG* = "StudentActivity";  
  
 private TextView time, status, subject, cabinet, corp, teacher;  
 public Date currentTime;  
  
 @Override protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_student*);  
 Objects.*requireNonNull*(getSupportActionBar()).hide();  
  
 final Spinner spinner = findViewById(R.id.*groupList*);  
  
 List<Group> groups = new ArrayList<>();  
 initGroupList(groups);  
  
 ArrayAdapter<?> adapter = new ArrayAdapter<>(this, android.R.layout.*simple\_spinner\_item*, groups);  
 adapter.setDropDownViewResource(android.R.layout.*simple\_spinner\_dropdown\_item*);  
  
 spinner.setAdapter(adapter);  
  
 spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {  
 public void onItemSelected(AdapterView<?> parent, View itemSelected, int selectedItemPosition, long selectedId) {  
 Object item = adapter.getItem(selectedItemPosition);  
 Log.*d*(*TAG*,"selectedItem: " + item);  
 }  
 public void onNothingSelected(AdapterView<?> parent) { }  
 });  
  
 time = findViewById(R.id.*time*);  
 initTime();  
  
 status = findViewById(R.id.*status*);  
 subject = findViewById(R.id.*subject*);  
 cabinet = findViewById(R.id.*cabinet*);  
 corp = findViewById(R.id.*corp*);  
 teacher = findViewById(R.id.*teacher*);  
  
 initData();  
 }  
  
 private void initGroupList(List<Group> groups){  
 String[] pr = { "ПИ", "БИ", "УБ", "Э", "И", "Ю" };  
 String[] yr = { "16", "17", "18", "19", "20" };  
 int i=0;  
 for (String p : pr) {  
 for (String y : yr) {  
 for (int z = 1; z < 5; z++) {  
 i++;  
 groups.add(new Group(i, p + "-" + y + "-" + z));  
 }  
 }  
 }  
 }  
  
 private void initTime(){  
 currentTime = new Date();  
 String[] Week\_days = { "", "Воскресенье", "Понедельник", "Вторник", "Среда", "Четверг", "Пятница", "Субота" };  
 DateFormatSymbols symbols = new DateFormatSymbols( new Locale("en", "US"));  
 symbols.setShortWeekdays(Week\_days);  
  
 @SuppressLint("SimpleDateFormat") SimpleDateFormat simpleDateFormat = new SimpleDateFormat("HH:mm',' E", symbols);  
 time.setText(simpleDateFormat.format(currentTime));  
 }  
  
 private void initData(){  
 status.setText("Нет пар");  
  
 subject.setText("Дисциплина");  
 cabinet.setText("Кабинет");  
 corp.setText("Корпус");  
 teacher.setText("Преподователь");  
 }  
  
 static class Group{  
 private Integer id;  
 private String name;  
  
 public Group(Integer id, String name){  
 this.id = id;  
 this.name = name;  
 }  
 public Integer getId(){ return id; }  
 public void setId(Integer id) { this.id = id; }  
 @Override public String toString() { return name; }  
 public String getName() { return name; }  
 public void setName(String name){ this.name = name; }  
 }  
}

# **Приложение В. Листинг «TeacherActivity»**

package org.hse.android;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.annotation.SuppressLint;  
import android.os.Bundle;  
import android.util.Log;  
import android.view.View;  
import android.widget.AdapterView;  
import android.widget.ArrayAdapter;  
import android.widget.Spinner;  
import android.widget.TextView;  
import java.text.DateFormatSymbols;  
import java.text.SimpleDateFormat;  
import java.util.ArrayList;  
import java.util.Date;  
import java.util.List;  
import java.util.Locale;  
import java.util.Objects;  
  
public class TeacherActivity extends AppCompatActivity {  
  
 private static final String *TAG* = "TeacherActivity";  
  
 private TextView time, status, subject, cabinet, corp, teacher;  
 public Date currentTime;  
  
 @Override protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_teacher*);  
 Objects.*requireNonNull*(getSupportActionBar()).hide();  
  
 final Spinner spinner = findViewById(R.id.*groupList*);  
  
 List<StudentActivity.Group> groups = new ArrayList<>();  
 initGroupList(groups);  
  
 ArrayAdapter<?> adapter = new ArrayAdapter<>(this, android.R.layout.*simple\_spinner\_item*, groups);  
 adapter.setDropDownViewResource(android.R.layout.*simple\_spinner\_dropdown\_item*);  
  
 spinner.setAdapter(adapter);  
  
 spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {  
 public void onItemSelected(AdapterView<?> parent, View itemSelected, int selectedItemPosition, long selectedId) {  
 Object item = adapter.getItem(selectedItemPosition);  
 Log.*d*(*TAG*,"selectedItem: " + item);  
 }  
 public void onNothingSelected(AdapterView<?> parent) { }  
 });  
  
 time = findViewById(R.id.*time*);  
 initTime();  
  
 status = findViewById(R.id.*status*);  
 subject = findViewById(R.id.*subject*);  
 cabinet = findViewById(R.id.*cabinet*);  
 corp = findViewById(R.id.*corp*);  
 teacher = findViewById(R.id.*teacher*);  
  
 initData();  
 }  
 private void initGroupList(List<StudentActivity.Group> groups){  
 groups.add(new StudentActivity.Group(1,"Преподователь 1"));  
 groups.add(new StudentActivity.Group(2,"Преподователь 2"));  
 }  
 private void initTime(){  
 currentTime = new Date();  
 String[] Week\_days = { "", "Воскресенье", "Понедельник", "Вторник", "Среда", "Четверг", "Пятница", "Субота" };  
 DateFormatSymbols symbols = new DateFormatSymbols( new Locale("en", "US"));  
 symbols.setShortWeekdays(Week\_days);  
  
 @SuppressLint("SimpleDateFormat")  
 SimpleDateFormat simpleDateFormat = new SimpleDateFormat("HH:mm',' E", symbols);  
 time.setText(simpleDateFormat.format(currentTime));  
 }  
 private void initData(){  
 status.setText("Нет пар");  
  
 subject.setText("Дисциплина");  
 cabinet.setText("Кабинет");  
 corp.setText("Корпус");  
 teacher.setText("Преподователь");  
 }  
}

# **Приложение Г. Листинг «SettingsActivity»**

package org.hse.android;  
  
import androidx.annotation.NonNull;  
import androidx.annotation.Nullable;  
import androidx.appcompat.app.AlertDialog;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.app.ActivityCompat;  
import androidx.core.content.FileProvider;  
import android.Manifest;  
import android.annotation.SuppressLint;  
import android.content.ActivityNotFoundException;  
import android.content.Context;  
import android.content.Intent;  
import android.content.pm.PackageManager;  
import android.hardware.Sensor;  
import android.hardware.SensorEvent;  
import android.hardware.SensorEventListener;  
import android.hardware.SensorManager;  
import android.net.Uri;  
import android.os.Bundle;  
import android.provider.MediaStore;  
import android.util.Log;  
import android.view.View;  
import android.widget.ArrayAdapter;  
import android.widget.EditText;  
import android.widget.ImageView;  
import android.widget.ListView;  
import android.widget.TextView;  
import android.widget.Toast;  
import java.io.File;  
import java.io.IOException;  
import java.text.SimpleDateFormat;  
import java.util.ArrayList;  
import java.util.Date;  
import java.util.List;  
import java.util.Locale;  
import java.util.Objects;  
import com.bumptech.glide.Glide;  
  
public class SettingsActivity extends AppCompatActivity implements SensorEventListener {  
  
 private final static String *TAG* = "SettingsActivity";  
  
 private static final int *REQUEST\_IMAGE\_CAPTURE* = 10;  
 private static final int *REQUEST\_PERMISSION\_CODE* = 1;  
  
 private final static String *PERMISSION* = Manifest.permission.*CAMERA*;  
  
 private ImageView photo;  
 private EditText name;  
  
 private PreferenceManager preferenceManager;  
 private SensorManager sensorManager;  
 private Sensor light;  
 private TextView sensorLight;  
  
 File imagePath;  
 File image;  
 Boolean photo\_changed = false;  
  
 @Override protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_settings*);  
 Objects.*requireNonNull*(getSupportActionBar()).hide();  
  
 preferenceManager = new PreferenceManager(this);  
 ListView sensors\_list = findViewById(R.id.*sensors\_list*);  
 name = findViewById(R.id.*name*);  
 photo = findViewById(R.id.*photo*);  
 sensorLight = findViewById(R.id.*sensor\_light*);  
 sensorManager = (SensorManager) getSystemService(Context.*SENSOR\_SERVICE*);  
 light = sensorManager.getDefaultSensor(Sensor.*TYPE\_LIGHT*);  
  
 View buttonPhoto = findViewById(R.id.*button\_photo*);  
 buttonPhoto.setOnClickListener(v -> checkPermission());  
  
 View buttonSave = findViewById(R.id.*button\_save*);  
 buttonSave.setOnClickListener(v -> {  
 loadPhoto();  
 preferenceManager.saveValue("name", name.getText().toString());  
 if(photo\_changed) {  
 preferenceManager.saveValue("photo", image.getPath());  
 }  
 Toast.*makeText*(SettingsActivity.this, "Данные сохранены", Toast.*LENGTH\_SHORT*).show();  
 });  
  
 name.setText(preferenceManager.getValue("name"));  
 File imgFile = new File(preferenceManager.getValue("photo"));  
 if(imgFile.exists()){ Glide.*with*(this).load(imgFile).into(photo); }  
 else{ photo.setImageResource(R.drawable.*no\_image*); }  
 loadPhoto();  
  
 if(sensorManager.getDefaultSensor(Sensor.*TYPE\_LIGHT*) == null) { sensorLight.setText("Нет датчика освещенности"); }  
  
 List<Sensor> listSensor = sensorManager.getSensorList(Sensor.*TYPE\_ALL*);  
 List<String> listSensorType = new ArrayList<>();  
 for (int i = 0; i < listSensor.size(); i++) { listSensorType.add(listSensor.get(i).getName()); }  
  
 ArrayAdapter<?> adapter = new ArrayAdapter<>(this, android.R.layout.*simple\_list\_item\_1*, listSensorType);  
 sensors\_list.setAdapter(adapter);  
 }  
  
 @Override  
 protected void onResume() {  
 super.onResume();  
  
 name.setText(preferenceManager.getValue("name"));  
  
 File imgFile = new File(preferenceManager.getValue("photo"));  
 if (imgFile.exists()) { Glide.*with*(this).load(imgFile).into(photo); }  
 else { photo.setImageResource(R.drawable.*no\_image*); }  
  
 sensorManager.registerListener(this, light, SensorManager.*SENSOR\_DELAY\_NORMAL*);  
 }  
  
 @Override  
 protected void onPause() {  
 super.onPause();  
  
 name.setText(preferenceManager.getValue("name"));  
  
 File imgFile = new File(preferenceManager.getValue("photo"));  
 if(imgFile.exists()){ Glide.*with*(this).load(imgFile).into(photo); }  
 else{ photo.setImageResource(R.drawable.*no\_image*); }  
  
 sensorManager.unregisterListener(this);  
 }  
  
 public final void onAccuracyChanged(Sensor sensor, int accuracy) { }  
  
 public final void onSensorChanged(SensorEvent event) {  
 float lux = event.values[0];  
 sensorLight.setText(String.*format*("%s lux", lux));  
 }  
  
 public void checkPermission(){  
 int permissionsCheck = ActivityCompat.*checkSelfPermission*(this, *PERMISSION*);  
 if (permissionsCheck != PackageManager.*PERMISSION\_GRANTED*) {  
 if(ActivityCompat.*shouldShowRequestPermissionRationale*(this, *PERMISSION*)) {  
 AlertDialog.Builder builder = new AlertDialog.Builder(this);  
 builder.setTitle("Нужно предоставить права")  
 .setMessage("Для снятия фото нужно предоставить права на фото")  
 .setPositiveButton(android.R.string.*ok*, (dialog, id) ->  
 requestPermissions(*PERMISSION*, *REQUEST\_PERMISSION\_CODE*));  
 builder.create().show();  
 }  
 else { requestPermissions(*PERMISSION*, *REQUEST\_PERMISSION\_CODE*); }  
 }  
 else { dispatchTakePictureIntent(); }  
 }  
   
 private void requestPermissions(String permissionName, int permissionRequestCode) {  
 ActivityCompat.*requestPermissions*(this, new String[]{permissionName}, permissionRequestCode);  
 }  
  
 @Override  
 public void onRequestPermissionsResult(int requestCode, @NonNull String[] permissions, @NonNull int[] result) {  
 if(requestCode == *REQUEST\_PERMISSION\_CODE*) {  
 if(result.length > 0 && result[0] == PackageManager.*PERMISSION\_GRANTED*) {  
 dispatchTakePictureIntent();  
 }  
 else {  
 Log.*d*(*TAG*, "Permission not granted");  
 requestPermissions(*PERMISSION*, *REQUEST\_PERMISSION\_CODE*);  
 }  
 }  
 }  
  
 @Override  
 protected void onActivityResult(int requestCode, int resultCode, @Nullable Intent data) {  
 if (requestCode == *REQUEST\_IMAGE\_CAPTURE* && resultCode == *RESULT\_OK*){  
 loadPhoto();  
 return;  
 }  
 super.onActivityResult(requestCode, resultCode, data);  
 }  
  
 private void loadPhoto() { if(image != null) Glide.*with*(this).load(image).into(photo); }  
  
 @SuppressLint("QueryPermissionsNeeded")  
 private void dispatchTakePictureIntent() {  
 Intent takePictureIntent = new Intent(MediaStore.*ACTION\_IMAGE\_CAPTURE*);  
 if(takePictureIntent.resolveActivity(getPackageManager()) != null) {  
 //Create a file to store the image  
 File photoFile = null;  
 try { photoFile = createImageFile(); }  
 catch (IOException ex) { Log.*e*(*TAG*, "Create file", ex); }  
 if(photoFile != null) {  
 Uri photoURI = FileProvider.*getUriForFile*(this, BuildConfig.*APPLICATION\_ID* + ".provider", photoFile);  
 takePictureIntent.putExtra(MediaStore.*EXTRA\_OUTPUT*,  
 photoURI);  
 try { startActivityForResult(takePictureIntent, *REQUEST\_IMAGE\_CAPTURE*); }  
 catch (ActivityNotFoundException e) { Log.*e*(*TAG*, "Start activity", e); }  
 }  
 }  
 loadPhoto();  
 }  
  
 private File createImageFile() throws IOException {  
 String timeStamp = new SimpleDateFormat("yyyyMMdd\_HHmmss", Locale.*getDefault*()).format(new Date());  
 String imageFileName = "IMG\_" + timeStamp + "\_";  
  
 imagePath = new File(getFilesDir(), "external\_files");  
 imagePath.mkdir();  
 image = new File(imagePath.getPath(), String.*format*("%s.img", imageFileName));  
 photo\_changed = true;  
  
 return image;  
 }  
}

# **Приложение Д. Листинг «PreferenceManager»**

package org.hse.android;  
  
import android.content.Context;  
import android.content.SharedPreferences;  
  
public class PreferenceManager {  
 private final static String *PREFERENCE\_FILE* = "org.hse.android.file";  
 private final SharedPreferences sharedPref;  
  
 public PreferenceManager(Context context) {  
 sharedPref = context.getSharedPreferences(*PREFERENCE\_FILE*, Context.*MODE\_PRIVATE*);  
 }  
  
 ///////////////////////  
  
 public void saveValue(String key, String value) {  
 SharedPreferences.Editor editor = sharedPref.edit();  
 editor.putString(key, value);  
 editor.apply();  
 }  
  
 public String getValue(String key) {  
 return sharedPref.getString(key, "");  
 }  
}

# **Приложение Е. Листинг «activity\_main»**

<?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:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
  
 <ImageView  
 android:id="@+id/Logo"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="25dp"  
 android:layout\_marginLeft="25dp"  
 android:layout\_marginTop="20dp"  
 android:layout\_marginEnd="25dp"  
 android:layout\_marginRight="25dp"  
 android:layout\_marginBottom="80dp"  
 android:gravity="center\_horizontal"  
 android:orientation="vertical"  
 android:scaleX="1.3"  
 android:scaleY="1.3"  
 app:layout\_constraintBottom\_toTopOf="@+id/button\_student"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:srcCompat="@drawable/logo"  
 android:contentDescription="@string/logo\_of\_hse" />  
  
 <Button  
 android:id="@+id/button\_student"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="55dp"  
 android:layout\_marginLeft="55dp"  
 android:layout\_marginEnd="55dp"  
 android:layout\_marginRight="55dp"  
 android:layout\_marginBottom="20dp"  
 android:gravity="center\_horizontal"  
 android:maxLines="1"  
 android:text="@string/student\_button\_ru"  
 android:textAppearance="@style/TextAppearance.AppCompat.Medium"  
 app:layout\_constraintBottom\_toTopOf="@+id/button\_teacher"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.0"  
 app:layout\_constraintStart\_toStartOf="parent" />  
  
 <Button  
 android:id="@+id/button\_teacher"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="31dp"  
 android:layout\_marginLeft="31dp"  
 android:layout\_marginEnd="31dp"  
 android:layout\_marginRight="31dp"  
 android:layout\_marginBottom="20dp"  
 android:gravity="center"  
 android:maxLines="1"  
 android:text="@string/teacher\_button\_ru"  
 android:textAppearance="@style/TextAppearance.AppCompat.Medium"  
 app:layout\_constraintBottom\_toTopOf="@+id/button\_settings"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.0"  
 app:layout\_constraintStart\_toStartOf="parent" />  
  
 <Button  
 android:id="@+id/button\_settings"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="160dp"  
 android:layout\_marginLeft="160dp"  
 android:layout\_marginEnd="160dp"  
 android:layout\_marginRight="160dp"  
 android:layout\_marginBottom="40dp"  
 android:gravity="center"  
 android:maxLines="1"  
 android:text="@string/settings\_ru"  
 android:textAppearance="@style/TextAppearance.AppCompat.Medium"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent" />  
</androidx.constraintlayout.widget.ConstraintLayout>

# **Приложение Ж. Листинг «activity\_student»**

<?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"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/label"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 android:text="@string/first\_label\_s\_ru"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
 <Spinner  
 android:id="@+id/groupList"  
 android:layout\_width="150dp"  
 android:layout\_height="50dp"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/label" />  
  
 <LinearLayout  
 android:id="@+id/linearLayout"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 android:orientation="horizontal"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/groupList">  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/now"  
 android:layout\_width="70dp"  
 android:layout\_height="match\_parent"  
 android:layout\_weight="0"  
 android:text="@string/now\_label" />  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/time"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:text="@string/time\_ru" />  
 </LinearLayout>  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/status"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 android:text="@string/status\_ru"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.0"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout" />  
  
 <LinearLayout  
 android:id="@+id/linearLayout2"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 android:orientation="vertical"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/status">  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/subject"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/subject\_ru" />  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/cabinet"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/cabinet\_ru" />  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/corp"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/corp\_ru" />  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/teacher"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/teacher\_ru" />  
 </LinearLayout>  
  
 <Button  
 android:id="@+id/day\_cal\_button"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:minLines="1"  
 android:text="Расписание\nна день"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout2" />  
  
 <Button  
 android:id="@+id/week\_cal\_button"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginLeft="20dp"  
 android:layout\_marginTop="10dp"  
 android:text="Расписание\nна неделю"  
 app:layout\_constraintStart\_toEndOf="@+id/day\_cal\_button"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout2" />  
</androidx.constraintlayout.widget.ConstraintLayout>

# **Приложение З. Листинг «activity\_teacher»**

<?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"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/label"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 android:text="@string/first\_label\_t\_ru"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
 <Spinner  
 android:id="@+id/groupList"  
 android:layout\_width="150dp"  
 android:layout\_height="50dp"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/label" />  
  
 <LinearLayout  
 android:id="@+id/linearLayout"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 android:orientation="horizontal"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/groupList">  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/now"  
 android:layout\_width="70dp"  
 android:layout\_height="match\_parent"  
 android:layout\_weight="0"  
 android:text="@string/now\_label" />  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/time"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:text="@string/time\_ru" />  
 </LinearLayout>  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/status"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 android:text="@string/status\_ru"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout" />  
  
 <LinearLayout  
 android:id="@+id/linearLayout2"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 android:orientation="vertical"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/status">  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/subject"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/subject\_ru" />  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/cabinet"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/cabinet\_ru" />  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/corp"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/corp\_ru" />  
  
 <TextView  
 style="@style/Common\_text\_style"  
 android:id="@+id/teacher"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/teacher\_ru" />  
 </LinearLayout>  
  
 <Button  
 android:id="@+id/day\_cal\_button"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:minLines="1"  
 android:text="Расписание\nна день"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout2" />  
  
 <Button  
 android:id="@+id/week\_cal\_button"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginLeft="20dp"  
 android:layout\_marginTop="10dp"  
 android:text="Расписание\nна неделю"  
 app:layout\_constraintStart\_toEndOf="@+id/day\_cal\_button"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout2" />  
</androidx.constraintlayout.widget.ConstraintLayout>

# **Приложение И. Листинг «activity\_settings»**

<?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:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
  
 <LinearLayout  
 android:id="@+id/linearLayout3"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 android:orientation="horizontal"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent">  
  
 <LinearLayout  
 android:layout\_width="160dp"  
 android:layout\_height="wrap\_content"  
 android:orientation="vertical">  
  
 <TextView  
 android:id="@+id/textView"  
 style="@style/Mini\_text\_style"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center"  
 android:text="@string/photo\_textView" />  
  
 <ImageView  
 android:id="@+id/photo"  
 android:layout\_width="150dp"  
 android:layout\_height="170dp"  
 android:layout\_gravity="center"  
 android:contentDescription="@string/user\_avatar"  
 tools:srcCompat="@tools:sample/avatars" />  
  
 <Button  
 android:id="@+id/button\_photo"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center"  
 android:text="@string/take\_photo\_button\_ru" />  
 </LinearLayout>  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:gravity="center"  
 android:orientation="vertical">  
  
 <EditText  
 android:id="@+id/name"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:ems="10"  
 android:inputType="textPersonName"  
 android:hint="@string/name\_editView"  
 android:autofillHints="" />  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical">  
  
 <TextView  
 style="@style/Mini\_text\_style"  
 android:id="@+id/textView2"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/light\_textView" />  
  
 <TextView  
 style="@style/Mini\_text\_style"  
 android:id="@+id/sensor\_light"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="" />  
 </LinearLayout>  
 </LinearLayout>  
 </LinearLayout>  
  
 <Button  
 android:id="@+id/button\_save"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="160dp"  
 android:layout\_marginLeft="160dp"  
 android:layout\_marginTop="20dp"  
 android:layout\_marginEnd="160dp"  
 android:layout\_marginRight="160dp"  
 android:text="@string/save\_button\_ru"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout3" />  
  
 <TextView  
 android:id="@+id/sensors\_list\_label"  
 style="@style/Mini\_text\_style"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginTop="10dp"  
 android:text="@string/sensors\_list\_label"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_save" />  
  
 <ListView  
 android:id="@+id/sensors\_list"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="300dp"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginRight="10dp"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/sensors\_list\_label">  
 </ListView>  
</androidx.constraintlayout.widget.ConstraintLayout>

# **Приложение К. Листинг «AndroidManifest»**

<?xml version="1.0" encoding="utf-8"?>  
<manifest xmlns:android="http://schemas.android.com/apk/res/android"  
 package="org.hse.android">  
  
 <!-- <uses-permission android:name="android.permission.BLUETOOTH"/> -->  
 <!-- <uses-permission android:name="android.permission.BLUETOOTH\_ADMIN"/> -->  
 <uses-permission android:name="android.permission.CAMERA" />  
 <uses-permission android:name="android.permission.READ\_EXTERNAL\_STORAGE" />  
 <uses-permission android:name="android.permission.INTERNET" />  
 <uses-permission android:name="android.permission.ACCESS\_NETWORK\_STATE" />  
 <uses-permission android:name="android.permission.WRITE\_EXTERNAL\_STORAGE" />  
  
 <uses-feature  
 android:name="android.hardware.camera"  
 android:required="true" />  
  
 <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/Theme.HSE">  
 <meta-data  
 android:name="com.google.android.actions"  
 android:resource="@xml/file\_paths" />  
  
 <activity android:name=".MainActivity">  
 <intent-filter>  
 <action android:name="android.intent.action.MAIN" />  
  
 <category android:name="android.intent.category.LAUNCHER" />  
 </intent-filter>  
 </activity>  
 <activity android:name=".StudentActivity" />  
 <activity android:name=".TeacherActivity" />  
 <activity android:name=".SettingsActivity" />  
  
 <provider  
 android:name="androidx.core.content.FileProvider"  
 android:authorities="org.hse.android.provider"  
 android:exported="false"  
 android:grantUriPermissions="true">  
 <meta-data  
 android:name="android.support.FILE\_PROVIDER\_PATHS"  
 android:resource="@xml/file\_paths" />  
 </provider>  
 </application>  
</manifest>

# **Приложение Л. Листинг «file\_paths.xml»**

<?xml version="1.0" encoding="utf-8"?>  
<paths>  
 <files-path  
 name="files"  
 path="external\_files">  
 </files-path>  
</paths>

# **Приложение М. Листинг «strings.xml»**

<resources>  
 <string name="app\_name">Timetable for HSE FE</string>  
 <string name="about\_main">Программа созданная в рамках курса "Мобильная разработка" НИУ ВШЭ</string>  
 <string name="about\_stud\_list">Timetable for HSE FE</string>  
 <string name="about\_teach\_list">Timetable for HSE FE</string>  
  
 <string name="teacher\_button\_ru">РАСПИСАНИЕ ДЛЯ ПРЕПОДОВАТЕЛЯ</string>  
 <string name="student\_button\_ru">РАСПИСАНИЕ ДЛЯ СТУДЕНТОВ</string>  
 <string name="settings\_ru">НАСТРОЙКИ</string>  
 <string name="take\_photo\_button\_ru">Сделать фото</string>  
 <string name="save\_button\_ru">Сохранить</string>  
 <string name="logo\_of\_hse">Logo of HSE</string>  
  
 <string name="first\_label\_s\_ru">Выберите группу:</string>  
 <string name="first\_label\_t\_ru">Выберите преподователя:</string>  
 <string name="now\_label">Сейчас:</string>  
 <string name="time\_ru">00:00</string>  
 <string name="status\_ru">Идет пара / Нет пар</string>  
 <string name="subject\_ru">Дисциплина</string>  
 <string name="cabinet\_ru">Кабинет</string>  
 <string name="corp\_ru">Корпус</string>  
 <string name="teacher\_ru">Преподователь</string>  
  
 <string name="photo\_textView">Укажите фото</string>  
 <string name="name\_editView">Укажите ваше имя</string>  
 <string name="light\_textView">Текущая освещаемость:</string>  
 <string name="user\_avatar">User\_avatar</string>  
 <string name="sensors\_list\_label">Список доступных датчиков:</string>  
</resources>

# **Приложение Н. Листинг «styles.xml»**

<?xml version="1.0" encoding="utf-8"?>  
<resources>  
 <style name="Common\_text\_style">  
 <item name="android:textSize">16sp</item>  
 <item name="android:textStyle">bold</item>  
 <item name="android:textColor">@color/SecondaryHSE</item>  
 <item name="android:typeface">monospace</item>  
 </style>  
 <style name="Mini\_text\_style">  
 <item name="android:textSize">13sp</item>  
 <item name="android:textColor">@color/SecondaryHSE</item>  
 <item name="android:typeface">monospace</item>  
 </style>  
</resources>

# **Приложение О. Листинг «build.gradle»**

plugins **{** id 'com.android.application'  
**}**android **{** compileSdkVersion 30  
 buildToolsVersion "30.0.3"  
  
 defaultConfig **{** applicationId "org.hse.android"  
 minSdkVersion 16  
 targetSdkVersion 30  
 versionCode 1  
 versionName "1.0"  
  
 testInstrumentationRunner "androidx.test.runner.AndroidJUnitRunner"  
 **}** buildTypes **{** release **{** minifyEnabled false  
 proguardFiles getDefaultProguardFile('proguard-android-optimize.txt'), 'proguard-rules.pro'  
 **}  
 }** compileOptions **{** sourceCompatibility JavaVersion.*VERSION\_1\_8* targetCompatibility JavaVersion.*VERSION\_1\_8* **}  
}**dependencies **{** implementation 'androidx.appcompat:appcompat:1.2.0'  
 implementation 'com.google.android.material:material:1.3.0'  
 implementation 'androidx.constraintlayout:constraintlayout:2.0.4'  
  
 // Desugaring https://developer.android.com/studio/write/java8-support  
 coreLibraryDesugaring 'com.android.tools:desugar\_jdk\_libs:1.1.1'  
  
 testImplementation 'junit:junit:4.+'  
 androidTestImplementation 'androidx.test.ext:junit:1.1.2'  
 androidTestImplementation 'androidx.test.espresso:espresso-core:3.3.0'  
  
 // Glide  
 implementation 'com.github.bumptech.glide:glide:4.11.0'  
 annotationProcessor 'com.github.bumptech.glide:compiler:4.11.0'  
**}**