**Лабораторная работа 5.**

**Работа со списками**

**Теория**

<https://metanit.com/java/tutorial/>

<https://metanit.com/java/android/>

**Практика**

**Задание 1**

Разработать приложение, которое выводит на экран список объектов класса Student.

Содержание **MainActivity**

**package** com.example.listlab;  
  
**import** androidx.appcompat.app.AppCompatActivity;  
  
**import** android.os.Bundle;  
**import** android.widget.ArrayAdapter;  
**import** android.widget.ListView;  
  
**import** java.util.ArrayList;  
  
**public class** MainActivity **extends** AppCompatActivity {  
  
 *// набор данных, которые свяжем со списком* ArrayList<Student> **students** = **new** ArrayList<Student>();  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_main***);  
  
 **students**.add(**new** Student(**"Иван"**, **"Иванов"**, 3));  
 **students**.add(**new** Student(**"Василий"**, **"Васильев"**, 2));  
 **students**.add(**new** Student(**"Олег"**, **"Сычев"**, 4));  
  
 *// получаем элемент ListView* ListView countriesList = (ListView) findViewById(R.id.***countriesList***);  
  
 *// создаем адаптер* ArrayAdapter<Student> adapter = **new** ArrayAdapter(**this**,  
 android.R.layout.***simple\_list\_item\_1***, **students**);  
  
 *// устанавливаем для списка адаптер* countriesList.setAdapter(adapter);  
 }  
}

Содержание **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"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"**>  
  
 <**ListView  
 android:id="@+id/countriesList"  
 android:layout\_width="0dp"  
 android:layout\_height="0dp"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintRight\_toRightOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"**>  
 </**ListView**>  
  
</**androidx.constraintlayout.widget.ConstraintLayout**>

Содержание класса **Student**

**package** com.example.listlab;  
  
**import** java.io.Serializable;  
  
**public class** Student **implements** Serializable {  
 String **name**;  
 String **surname**;  
 **int course**;  
  
 **public** Student() {  
  
 }  
  
 **public** Student(String \_name, String \_surname, **int** \_course) {  
 **name** = \_name;  
 **surname** = \_surname;  
 **course** = \_course;  
 }  
  
 @Override  
 **public** String toString() {  
 **return** String.*format*(**"Name: "** + **name** + **"\nSurname: "** + **surname** + **"\nCourse: "** + **course**);  
 }  
}

**Задание 2**

Разработать приложение, позволяющее выводить в TextView выбранный элемент из списка.

Содержание **MainActivity**

**package** com.example.listlab;  
  
**import** androidx.appcompat.app.AppCompatActivity;  
  
**import** android.os.Bundle;  
**import** android.view.View;  
**import** android.widget.AdapterView;  
**import** android.widget.ArrayAdapter;  
**import** android.widget.ListView;  
**import** android.widget.TextView;  
  
**import** java.util.ArrayList;  
  
**public class** MainActivity **extends** AppCompatActivity {  
  
 *// набор данных, которые свяжем со списком* ArrayList<Student> **students** = **new** ArrayList<Student>();  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_main***);  
  
 TextView selected = (TextView) findViewById(R.id.***selection***);  
  
 **students**.add(**new** Student(**"Иван"**, **"Иванов"**, 3));  
 **students**.add(**new** Student(**"Василий"**, **"Васильев"**, 2));  
 **students**.add(**new** Student(**"Олег"**, **"Сычев"**, 4));  
  
 ListView studentsList = (ListView) findViewById(R.id.***countriesList***);  
  
 ArrayAdapter<Student> adapter = **new** ArrayAdapter(**this**,  
 android.R.layout.***simple\_list\_item\_1***, **students**);  
  
 studentsList.setAdapter(adapter);  
  
 studentsList.setOnItemClickListener(**new** AdapterView.OnItemClickListener(){  
 @Override  
 **public void** onItemClick(AdapterView<?> parent, View v, **int** position, **long** id)  
 {  
 Student selectedItem = **students**.get(position);  
 selected.setText(selectedItem.toString());  
 }  
 });  
 }  
}

Содержание **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"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"**>  
  
 <**TextView  
 android:id="@+id/selection"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:textSize="22sp"  
 android:text="Selected"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintRight\_toRightOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"** />  
  
 <**ListView  
 android:id="@+id/countriesList"  
 android:layout\_width="0dp"  
 android:layout\_height="0dp"  
 app:layout\_constraintTop\_toBottomOf="@+id/selection"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintRight\_toRightOf="parent"**>  
 </**ListView**>  
  
</**androidx.constraintlayout.widget.ConstraintLayout**>

**Задание 3**

Реализовать возможность добавления и удаления элеметов списка.

Содержание **MainActivity**

**package** com.example.listlab;  
  
**import** androidx.appcompat.app.AppCompatActivity;  
  
**import** android.os.Bundle;  
**import** android.view.View;  
**import** android.widget.AdapterView;  
**import** android.widget.ArrayAdapter;  
**import** android.widget.EditText;  
**import** android.widget.ListView;  
**import** android.widget.TextView;  
  
**import** java.util.ArrayList;  
  
**public class** MainActivity **extends** AppCompatActivity {  
  
 ArrayList<Student> **students** = **new** ArrayList<Student>();  
 ArrayList<Student> **selectedStudents** = **new** ArrayList<Student>();  
 ArrayAdapter<Student> **adapter**;  
 ListView **studentsList**;  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_main***);  
  
 **students**.add(**new** Student(**"Иван"**, **"Иванов"**, 3));  
 **students**.add(**new** Student(**"Василий"**, **"Васильев"**, 2));  
 **students**.add(**new** Student(**"Олег"**, **"Сычев"**, 4));  
  
 **studentsList** = (ListView) findViewById(R.id.***studentsList***);  
  
 **adapter** = **new** ArrayAdapter(**this**,  
 android.R.layout.***simple\_list\_item\_multiple\_choice***, **students**);  
  
 **studentsList**.setAdapter(**adapter**);  
  
 **studentsList**.setOnItemClickListener(**new** AdapterView.OnItemClickListener(){  
 @Override  
 **public void** onItemClick(AdapterView<?> parent, View v, **int** position, **long** id)  
 {  
 Student selectedItem = **students**.get(position);  
 **if**(**studentsList**.isItemChecked(position))  
 **selectedStudents**.add(selectedItem);  
 **else  
 selectedStudents**.remove(selectedItem);  
 }  
 });  
 }  
  
 **public void** add(View view){  
 EditText editTextName = (EditText) findViewById(R.id.***name***);  
 EditText editTextSurname = (EditText) findViewById(R.id.***surname***);  
 EditText editTextCourse = (EditText) findViewById(R.id.***course***);  
  
 String name = editTextName.getText().toString();  
 String surname = editTextSurname.getText().toString();  
 String course = editTextCourse.getText().toString();  
  
 **if**(!name.isEmpty() && !surname.isEmpty() && !course.isEmpty()){  
 Student student = **new** Student(name, surname, Integer.*parseInt*(course));  
 **adapter**.add(student);  
 editTextName.setText(**""**);  
 editTextSurname.setText(**""**);  
 editTextCourse.setText(**""**);  
 **adapter**.notifyDataSetChanged();  
 }  
 }  
  
 **public void** remove(View view){  
 *// получаем и удаляем выделенные элементы* **for**(**int** i=0; i< **selectedStudents**.size();i++){  
 **adapter**.remove(**selectedStudents**.get(i));  
 }  
 *// снимаем все ранее установленные отметки* **studentsList**.clearChoices();  
 *// очищаем массив выбраных объектов* **selectedStudents**.clear();  
  
 **adapter**.notifyDataSetChanged();  
 }  
}

Содержание **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"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"**>  
  
 <**EditText  
 android:id="@+id/name"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="20dp"  
 android:hint="Name"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintRight\_toRightOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"** />  
  
 <**EditText  
 android:id="@+id/surname"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:hint="Surname"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintRight\_toRightOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/name"** />  
  
 <**EditText  
 android:id="@+id/course"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:hint="Course"  
 android:inputType="number"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintRight\_toRightOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/surname"** />  
  
 <**Button  
 android:id="@+id/addButton"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Add"  
 android:onClick="add"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/course"** />  
  
 <**Button  
 android:id="@+id/removeButton"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Remove selected"  
 android:onClick="remove"  
 app:layout\_constraintRight\_toRightOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/course"** />  
  
 <**ListView  
 android:id="@+id/studentsList"  
 android:layout\_width="0dp"  
 android:layout\_height="0dp"  
 android:choiceMode="multipleChoice"  
 app:layout\_constraintTop\_toBottomOf="@+id/addButton"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintRight\_toRightOf="parent"**>  
 </**ListView**>  
  
</**androidx.constraintlayout.widget.ConstraintLayout**>

**Задание 4**

Разработать приложение осуществляющее поиск позиции элемента типа String в списке.