**Лабораторная работа 3.**

**Основы разработки Java Android**

**Теория**

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

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

**Практика**

**Задание 1**

Передать данные в Activity

Содержание **MainActivity**

**package** com.example.test;  
  
**import** androidx.appcompat.app.AppCompatActivity;  
**import** androidx.constraintlayout.widget.ConstraintLayout;  
  
**import** android.content.Intent;  
**import** android.os.Bundle;  
**import** android.view.View;  
**import** android.widget.EditText;  
**import** android.widget.TextView;  
**import** android.view.ViewGroup;  
  
**public class** MainActivity **extends** AppCompatActivity {  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_main***);  
 }  
  
 **public void** sendData(View view) {  
 EditText editTextData1 = (EditText) findViewById(R.id.***data1***);  
 EditText editTextData2 = (EditText) findViewById(R.id.***data2***);  
  
 String data1Value = editTextData1.getText().toString();  
 String data2Value = editTextData2.getText().toString();  
  
 Intent intent = **new** Intent(**this**, ResultActivity.**class**);  
 intent.putExtra(**"data1"**, data1Value);  
 intent.putExtra(**"data2"**, data2Value);  
  
 startActivity(intent);  
 }  
}

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"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:paddingTop="50dp"  
 android:paddingBottom="50dp"  
 android:paddingLeft="25dp"  
 android:paddingRight="25dp"  
 tools:context=".MainActivity"**>  
  
 <**TextView  
 android:id="@+id/header"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Set data"  
 android:textSize="20dp"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"**/>  
  
 <**EditText  
 android:id="@+id/data1"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="20dp"  
 android:hint="data1"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintRight\_toRightOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/header"**/>  
  
 <**EditText  
 android:id="@+id/data2"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:hint="data2"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintRight\_toRightOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/data1"** />  
  
 <**Button  
 android:layout\_marginTop="20dp"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Send"  
 android:onClick="sendData"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/data2"** />  
  
</**androidx.constraintlayout.widget.ConstraintLayout**>

Содержание **ResultActivity**

**package** com.example.test;  
  
**import** androidx.appcompat.app.AppCompatActivity;  
  
**import** android.content.Intent;  
**import** android.os.Bundle;  
**import** android.widget.TextView;  
  
**public class** ResultActivity **extends** AppCompatActivity {  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_result***);  
  
 TextView data1TxtResult = (TextView) findViewById(R.id.***data1Result***);  
 TextView data2TxtResult = (TextView) findViewById(R.id.***data2Result***);  
  
 Bundle extras = getIntent().getExtras();  
  
 **if** (extras != **null**) {  
 String data1Value = extras.getString(**"data1"**);  
 String data2Value = extras.getString(**"data2"**);  
 data1TxtResult.setText(data1Value);  
 data2TxtResult.setText(data2Value);  
 }  
 }  
}

Содержание **activity\_result.xml**

*<?***xml version="1.0" encoding="utf-8"***?>*<**androidx.constraintlayout.widget.ConstraintLayout  
 xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:paddingTop="50dp"  
 android:paddingBottom="50dp"  
 android:paddingLeft="25dp"  
 android:paddingRight="25dp"  
 tools:context=".MainActivity"**>  
  
 <**TextView  
 android:id="@+id/data1Text"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Data1: "  
 android:textSize="18sp"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"**/>  
  
 <**TextView  
 android:id="@+id/data1Result"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="data1"  
 android:textSize="18sp"  
 app:layout\_constraintLeft\_toRightOf="@id/data1Text"  
 app:layout\_constraintTop\_toTopOf="parent"**/>  
  
 <**TextView  
 android:id="@+id/data2Text"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Data2: "  
 android:textSize="18sp"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/data1Text"**/>  
  
 <**TextView  
 android:id="@+id/data2Result"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="data2"  
 android:textSize="18sp"  
 app:layout\_constraintLeft\_toRightOf="@id/data2Text"  
 app:layout\_constraintTop\_toBottomOf="@id/data1Text"**/>  
  
</**androidx.constraintlayout.widget.ConstraintLayout**>

**Задание 2**

Создать класс и передать его в Activity

Содержание класса **Student**

**package** com.example.test;  
  
**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**);  
 }  
}

Содержание **MainActivity**

**package** com.example.test;  
  
**import** androidx.appcompat.app.AppCompatActivity;  
**import** androidx.constraintlayout.widget.ConstraintLayout;  
  
**import** android.content.Intent;  
**import** android.os.Bundle;  
**import** android.view.View;  
**import** android.widget.EditText;  
**import** android.widget.TextView;  
**import** android.view.ViewGroup;  
  
**public class** MainActivity **extends** AppCompatActivity {  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_main***);  
 }  
  
 **public void** sendData(View view) {  
 Intent intent = **new** Intent(**this**, ResultActivity.**class**);  
  
 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();  
 **int** course = Integer.*parseInt*(editTextCourse.getText().toString());  
  
 Student student1 = **new** Student();  
 student1.**name** = name;  
 student1.**surname** = surname;  
 student1.**course** = course;  
  
 *//Student student1 = new Student(name, surname, course);* intent.putExtra(**"student"**, student1);  
  
 startActivity(intent);  
 }  
}

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"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:paddingTop="50dp"  
 android:paddingBottom="50dp"  
 android:paddingLeft="25dp"  
 android:paddingRight="25dp"  
 tools:context=".MainActivity"**>  
  
 <**TextView  
 android:id="@+id/header"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Set student info"  
 android:textSize="20dp"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintTop\_toTopOf="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\_toBottomOf="@id/header"**/>  
  
 <**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:layout\_marginTop="20dp"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Send"  
 android:onClick="sendData"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/course"** />  
  
</**androidx.constraintlayout.widget.ConstraintLayout**>

Содержание **ResultActivity**

**package** com.example.test;  
  
**import** androidx.appcompat.app.AppCompatActivity;  
  
**import** android.content.Intent;  
**import** android.os.Bundle;  
**import** android.widget.TextView;  
  
**public class** ResultActivity **extends** AppCompatActivity {  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_result***);  
  
 Student student = (Student) getIntent().getSerializableExtra(**"student"**);  
  
 TextView nameTxtResult = (TextView) findViewById(R.id.***nameResult***);  
 TextView surnameTxtResult = (TextView) findViewById(R.id.***surnameResult***);  
 TextView courseTxtResult = (TextView) findViewById(R.id.***courseResult***);  
  
 nameTxtResult.setText(student.**name**);  
 surnameTxtResult.setText(student.**surname**);  
 courseTxtResult.setText(String.*valueOf*(student.**course**));  
 }  
}

Содержание **activity\_result.xml**

*<?***xml version="1.0" encoding="utf-8"***?>*<**androidx.constraintlayout.widget.ConstraintLayout  
 xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:paddingTop="50dp"  
 android:paddingBottom="50dp"  
 android:paddingLeft="25dp"  
 android:paddingRight="25dp"  
 tools:context=".MainActivity"**>  
  
 <**TextView  
 android:id="@+id/nameText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Name: "  
 android:textSize="18sp"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"**/>  
  
 <**TextView  
 android:id="@+id/nameResult"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="name"  
 android:textSize="18sp"  
 app:layout\_constraintLeft\_toRightOf="@id/nameText"  
 app:layout\_constraintTop\_toTopOf="parent"**/>  
  
 <**TextView  
 android:id="@+id/surnameText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Surname: "  
 android:textSize="18sp"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/nameText"**/>  
  
 <**TextView  
 android:id="@+id/surnameResult"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="surname"  
 android:textSize="18sp"  
 app:layout\_constraintLeft\_toRightOf="@id/surnameText"  
 app:layout\_constraintTop\_toBottomOf="@id/nameText"**/>  
  
 <**TextView  
 android:id="@+id/courseText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Course: "  
 android:textSize="18sp"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/surnameText"**/>  
  
 <**TextView  
 android:id="@+id/courseResult"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="course"  
 android:textSize="18sp"  
 app:layout\_constraintLeft\_toRightOf="@id/courseText"  
 app:layout\_constraintTop\_toBottomOf="@id/surnameText"**/>  
  
</**androidx.constraintlayout.widget.ConstraintLayout**>

**Задание 3**

Реализовать принцип инкапсуляции на примере поля course класса Student

Содержание класса **Student**

**package** com.example.test;  
  
**import** java.io.Serializable;  
  
**public class** Student **implements** Serializable {  
 String **name**;  
 String **surname**;  
 **private int course**;  
  
 **public** Student() {  
  
 }  
  
 **public** Student(String \_name, String \_surname, **int** \_course) {  
 **name** = \_name;  
 **surname** = \_surname;  
 SetCourse(\_course);  
 }

**public int** GetCourse() {  
 **return course**;  
 }

**public void** SetCourse(**int** courseValue) {  
 **if**(courseValue > 0) {  
 **course** = courseValue;  
 }  
 }  
  
 @Override  
 **public** String toString() {  
 **return** String.*format*(**"Name: "** + **name** + **"\nSurname: "** + **surname** + **"\nCourse: "** + **course**);  
 }  
}

Содержание **MainActivity**

**package** com.example.test;  
  
**import** androidx.appcompat.app.AppCompatActivity;  
**import** androidx.constraintlayout.widget.ConstraintLayout;  
  
**import** android.content.Intent;  
**import** android.os.Bundle;  
**import** android.view.View;  
**import** android.widget.EditText;  
**import** android.widget.TextView;  
**import** android.view.ViewGroup;  
  
**public class** MainActivity **extends** AppCompatActivity {  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_main***);  
 }  
  
 **public void** sendData(View view) {  
 Intent intent = **new** Intent(**this**, ResultActivity.**class**);  
  
 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();  
 **int** course = Integer.*parseInt*(editTextCourse.getText().toString());  
  
 Student student1 = **new** Student();  
 student1.**name** = name;  
 student1.**surname** = surname;  
 *//student1.course = course;* student1.SetCourse(course);  
  
 *//Student student1 = new Student(name, surname, course);* intent.putExtra(**"student"**, student1);  
  
 startActivity(intent);  
 }  
}

Содержание **ResultActivity**

**package** com.example.test;  
  
**import** androidx.appcompat.app.AppCompatActivity;  
  
**import** android.content.Intent;  
**import** android.os.Bundle;  
**import** android.widget.TextView;  
  
**public class** ResultActivity **extends** AppCompatActivity {  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_result***);  
  
 Student student = (Student) getIntent().getSerializableExtra(**"student"**);  
  
 TextView nameTxtResult = (TextView) findViewById(R.id.***nameResult***);  
 TextView surnameTxtResult = (TextView) findViewById(R.id.***surnameResult***);  
 TextView courseTxtResult = (TextView) findViewById(R.id.***courseResult***);  
  
 nameTxtResult.setText(student.**name**);  
 surnameTxtResult.setText(student.**surname**);  
 courseTxtResult.setText(String.*valueOf*(student.GetCourse()));  
 }  
}

**Задание 4**

Добавить в класс Student поля отчество(Middlename) и возраст(Age) с возможностью ввода и вывода на экран приложения. Установку значения поля age реализовать через метод SetAge(); с проверкой значения.