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Лабораторная работа №12
По дисциплине «Современные платформы программирования»

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Цель работы: освоить приемы разработки оконных клиент-серверных приложений на Java с использованием Сокетов

Постановка задачи: Разработать клиент-серверное оконное приложение на Java с использованием сокетов и JavaFX. Можно сделать одну программу с сочетанием функций клиента и сервера либо две отдельных (клиентская часть и серверная часть). Продемонстрировать работу разработанной программы в сети либо локально (127.0.0.1).

Игра «Палочки» (с вытягиванием палочек). На игровом поле находятся двадцать деревянных палочек. Игроки, по очереди, берут одну, две или три палочки (сколько именно брать — решать игроку). Взявший последнюю палочку проигрывает, поэтому цель игры заключается в том, чтобы оставить эту палочку оппоненту.

Текст программы:

Server:

Main.java:

```
package main;
import java.net.*;
import java.io.*;
public class Main {
    public static void main(String[] args) throws IOException {
        ServerSocket socket = new ServerSocket(8000); while (true) {
            Socket clientSocket = socket.accept();
            OutputStreamWriter writer = new
OutputStreamWriter(clientSocket.getOutputStream());
            int maxCount = 3; writer.write(String.valueOf(maxCount)); writer.flush();
            writer.close();
            System.out.println("Client connected!"); clientSocket.close();
        }
    }
}
```

Client:

Main.java:

```
package sample;
import javafx.application.Application; import javafx.fxml.FXMLLoader;
import javafx.scene.Parent;
import javafx.scene.Scene;
import javafx.stage.Stage;
public class Main extends Application {
```

```

@Override
public void start(Stage primaryStage) throws Exception{
    Parent root = FXMLLoader.load(getClass().getResource("sample.fxml"));
    primaryStage.setTitle("Game");
    primaryStage.setScene(new Scene(root, 553, 353));
    primaryStage.show();
}
public static void main(String[] args) {
    launch(args); }
}

```

Controller.java:

```

package sample;
import java.io.IOException; import java.net.URL;
import java.util.ResourceBundle; import javafx.fxml.FXML;
import javafx.fxml.FXMLLoader;
import javafx.scene.Parent;
import javafx.scene.Scene;
import javafx.scene.control.Button; import javafx.scene.control.TextField; import
javafx.stage.Stage;
public class Controller {
    @FXML
    private TextField first_player_field;
    @FXML
    private Button ok_btn;
    @FXML
    private TextField second_player_field;
    @FXML
    void initialize() { ok_btn.setOnAction(actionEvent -> {
        String firstPlayer = first_player_field.getText();
        String secondPlayer = second_player_field.getText();
        ok_btn.getScene().getWindow().hide();
        FXMLLoader loader = new FXMLLoader();
        loader.setLocation(getClass().getResource("Game.fxml"));
        try {
            loader.load();
        } catch (IOException e) {
            e.printStackTrace();
        }
        Parent root = loader.getRoot();
        GameController game = loader.getController();
        game.setup(firstPlayer,secondPlayer);
        Stage stage = new Stage();
        stage.setScene(new Scene(root));
        stage.showAndWait();
    }
    }
}

```

```
});  
}  
}
```

GameController.java:

```
package sample;  
import java.io.IOException;  
import javafx.fxml.FXML;  
import javafx.fxml.FXMLLoader;  
import javafx.scene.Parent;  
import javafx.scene.Scene;  
import javafx.scene.control.Button;  
import javafx.scene.text.Text;  
import javafx.stage.Stage;  
import java.net.*;  
import java.io.*;  
public class GameController {  
    @FXML  
    private Button btn10;  
    @FXML  
    private Button btn20;  
    @FXML  
    private Button btn14;  
    @FXML  
    private Button btn13;  
    @FXML  
    private Button btn12;  
    @FXML  
    private Button btn11;  
    @FXML  
    private Text player_lbl;  
    @FXML  
    private Text count_lbl;  
    @FXML  
    private Button btn8;  
    @FXML  
    private Button btn9;  
    @FXML  
    private Button btn6;  
    @FXML  
    private Button btn7;  
    @FXML  
    private Button btn4;  
    @FXML  
    private Button btn5;
```

```

    @FXML
private Button btn2;
    @FXML
private Button btn18;
    @FXML
private Button btn3;
    @FXML
private Button btn17;
    @FXML
private Button btn16;
    @FXML
private Button next_btn;
    @FXML
private Button btn1;
    @FXML
private Button btn15;
    @FXML
private Button btn19;
    @FXML
void initialize() throws IOException { next_btn.setOnAction(actionEvent -> {
    onNext();
});
    Button[] btnArray = new Button[20]; btnArray[0] = btn1;
    btnArray[1] = btn2;
    btnArray[2] = btn3;
    btnArray[3] = btn4; btnArray[4] = btn5; btnArray[5] = btn6; btnArray[6] = btn7; btnArray[7]
= btn8; btnArray[8] = btn9; btnArray[9] = btn10; btnArray[10] = btn11; btnArray[11] = btn12;
    btnArray[12] = btn13; btnArray[13] = btn14; btnArray[14] = btn15; btnArray[15] = btn16;
    btnArray[16] = btn17; btnArray[17] = btn18; btnArray[18] = btn19; btnArray[19] = btn20;
    for(Button b : btnArray) { b.setOnAction(actionEvent -> {
        if (counter < maxCount) { b.setVisible(false);
            counter++;
            size--;
            count_lbl.setText("Count: " + counter); if (size == 0) {
                String winner = (currentPlayer == firstPlayer) ? secondPlayer : firstPlayer;
                finish(winner); }
        } else {
            onNext(); }
    }); }
    getDataFromServer(); }
private String firstPlayer; private String secondPlayer; private int size = 20; private int
counter = 0; private String currentPlayer; private int maxCount = 0;
void onNext() { counter = 0;
    count_lbl.setText("Count: 0");
    currentPlayer = (currentPlayer == firstPlayer) ? secondPlayer : firstPlayer;

```

```

        player_lbl.setText(currentPlayer); }
void setup(String firstPlayer, String secondPlayer) {
    this.firstPlayer = firstPlayer;
    this.secondPlayer = secondPlayer;
    this.currentPlayer = firstPlayer;
    player_lbl.setText(currentPlayer);
}
void finish(String player) {
    FXMLLoader loader = new FXMLLoader();
loader.setLocation(getClass().getResource("Finish.fxml"));
    try { loader.load();
    } catch (IOException e) {
        e.printStackTrace(); }
    Parent root = loader.getRoot();
    FinishController finish = loader.getController(); finish.setup(player);
    Stage stage = new Stage();
    stage.setScene(new Scene(root)); stage.showAndWait();
}
void getDataFromServer() throws IOException {
    Socket clientSocket = new Socket("127.0.0.1", 8000); BufferedReader reader = new
BufferedReader(new
        InputStreamReader(clientSocket.getInputStream())); String message =
reader.readLine(); maxCount = Integer.parseInt(message); System.out.println(message);
clientSocket.close();
}
}

```

FinishController.java:

```

package sample;
import java.io.IOException; import java.net.URL;
import java.util.ResourceBundle; import javafx.fxml.FXML;
import javafx.fxml.FXMLLoader;
import javafx.scene.Parent;
import javafx.scene.Scene;
import javafx.scene.control.Button; import javafx.scene.text.Text; import javafx.stage.Stage;
public class FinishController {
    @FXML
private Button ok_btn;
    @FXML
private Text win_lbl;
    @FXML
void initialize() { ok_btn.setOnAction(actionEvent -> {
    ok_btn.getScene().getWindow().hide(); });
}
void setup(String player) {

```

```

String str = player + "\nwin!";
win_lbl.setText(str); }
}

```

sample.fxml:

```

<?xml version="1.0" encoding="UTF-8"?>
<?import javafx.scene.control.*?> <?import javafx.scene.text.*?> <?import java.lang.*?>
<?import javafx.scene.layout.*?> <?import javafx.geometry.Insets?> <?import
javafx.scene.layout.GridPane?> <?import javafx.scene.control.Button?> <?import
javafx.scene.control.Label?>
<Pane maxHeight="-Infinity" maxWidth="-Infinity" minHeight="-Infinity" minWidth="-Infinity"
prefHeight="353.0" prefWidth="553.0" xmlns="http://javafx.com/javafx"
xmlns:fx="http://javafx.com/fxml" fx:controller="sample.Controller">
  <children>
    <Text layoutX="201.0" layoutY="45.0" strokeType="OUTSIDE" strokeWidth="0.0"
      text="Start Game"> <font>
      <Font size="32.0" /> </font>
    </Text>
    <GridPane layoutX="148.0" layoutY="101.0" prefHeight="152.0" prefWidth="258.0">
      <columnConstraints>
        <ColumnConstraints hgrow="SOMETIMES" maxWidth="96.0" minWidth="10.0"
          prefWidth="68.0" />
        <ColumnConstraints hgrow="SOMETIMES" maxWidth="172.0" minWidth="10.0"
          prefWidth="172.0" /> </columnConstraints>
      <rowConstraints>
        <RowConstraints minHeight="10.0" prefHeight="30.0" vgrow="SOMETIMES" />
      <RowConstraints minHeight="10.0" prefHeight="30.0" vgrow="SOMETIMES" />
    </rowConstraints> <children>
      <Text strokeType="OUTSIDE" strokeWidth="0.0" text="First Player" />
      <Text strokeType="OUTSIDE" strokeWidth="0.0" text="Second Player"
GridPane.rowIndex="1" />
      <TextField fx:id="first_player_field" GridPane.columnIndex="1" />
      <TextField fx:id="second_player_field" GridPane.columnIndex="1"
GridPane.rowIndex="1" />
    </children> </GridPane>
    <Button fx:id="ok_btn" layoutX="249.0" layoutY="280.0" mnemonicParsing="false"
text="Ok" />
  </children> </Pane>

```

Game.fxml:

```

<?xml version="1.0" encoding="UTF-8"?>
<?import javafx.scene.text.*?> <?import java.lang.*?>
<?import java.util.*?>

```

```

<?import javafx.scene.*?> <?import javafx.scene.control.*?> <?import
javafx.scene.layout.*?>
<AnchorPane prefHeight="400.0" prefWidth="600.0" xmlns:fx="http://javafx.com/fxml"
xmlns="http://javafx.com/javafx" fx:controller="sample.GameController">
  <children>
    <Text fx:id="player_lbl" layoutX="259.0" layoutY="45.0" strokeType="OUTSIDE"
      strokeWidth="0.0" text="Player"> <font>
        <Font size="32.0" /> </font>
      </Text>
    <Text fx:id="count_lbl" layoutX="24.0" layoutY="380.0" strokeType="OUTSIDE"
strokeWidth="0.0" text="Count: 0">
      <font>
        <Font size="22.0" />
      </font>
    </Text>
    <Button fx:id="next_btn" layoutX="266.0" layoutY="347.0" mnemonicParsing="false"
prefHeight="38.0" prefWidth="68.0" text="Next">
      <font>
        <Font size="18.0" />
      </font>
    </Button>
    <Button fx:id="btn1" layoutX="24.0" layoutY="73.0" mnemonicParsing="false"
prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn2" layoutX="55.0" layoutY="73.0" mnemonicParsing="false"
prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn3" layoutX="86.0" layoutY="73.0" mnemonicParsing="false"
prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn4" layoutX="116.0" layoutY="73.0" mnemonicParsing="false"
prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn5" layoutX="145.0" layoutY="73.0" mnemonicParsing="false"
prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn6" layoutX="174.0" layoutY="73.0" mnemonicParsing="false"
prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn7" layoutX="202.0" layoutY="73.0" mnemonicParsing="false"
prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn8" layoutX="231.0" layoutY="73.0" mnemonicParsing="false"
prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn9" layoutX="259.0" layoutY="73.0" mnemonicParsing="false"
prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn10" layoutX="286.0" layoutY="73.0" mnemonicParsing="false"
prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn11" layoutX="317.0" layoutY="73.0" mnemonicParsing="false"
prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn12" layoutX="342.0" layoutY="73.0" mnemonicParsing="false"
      prefHeight="192.0" prefWidth="18.0" />
    <Button fx:id="btn13" layoutX="370.0" layoutY="73.0" mnemonicParsing="false"

```



```

        prefHeight="192.0" prefWidth="18.0" />
<Button fx:id="btn14" layoutX="397.0" layoutY="73.0" mnemonicParsing="false"
        prefHeight="192.0" prefWidth="18.0" />
<Button fx:id="btn15" layoutX="425.0" layoutY="73.0" mnemonicParsing="false"
        prefHeight="192.0" prefWidth="18.0" />
<Button fx:id="btn16" layoutX="452.0" layoutY="73.0" mnemonicParsing="false"
        prefHeight="192.0" prefWidth="18.0" />
<Button fx:id="btn17" layoutX="481.0" layoutY="73.0" mnemonicParsing="false"
        prefHeight="192.0" prefWidth="18.0" />
<Button fx:id="btn18" layoutX="508.0" layoutY="73.0" mnemonicParsing="false"
        prefHeight="192.0" prefWidth="18.0" />
<Button fx:id="btn19" layoutX="534.0" layoutY="73.0" mnemonicParsing="false"
        prefHeight="192.0" prefWidth="18.0" />
<Button fx:id="btn20" layoutX="559.0" layoutY="73.0" mnemonicParsing="false"
        prefHeight="192.0" prefWidth="18.0" /> </children>
</AnchorPane>

```

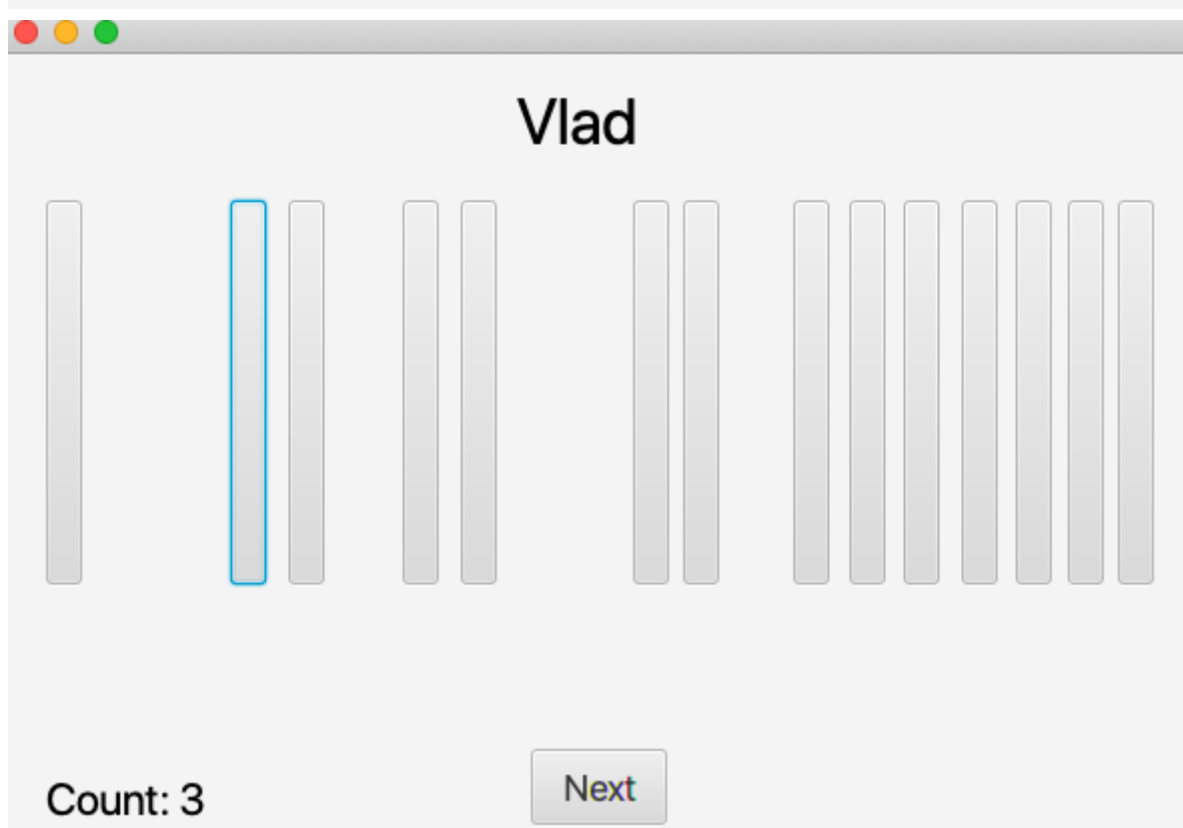
Finish.fxml:

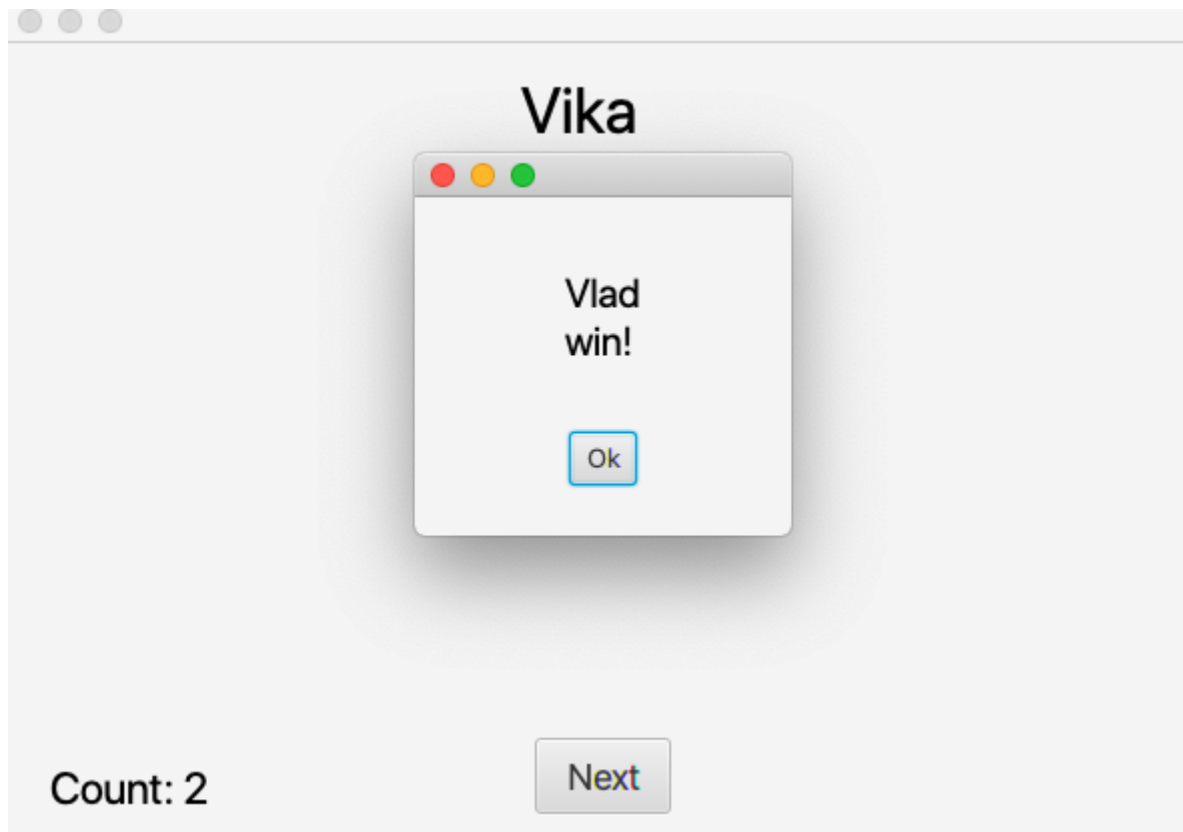
```

<?xml version="1.0" encoding="UTF-8"?>
<?import javafx.scene.text.*?> <?import java.lang.*?>
<?import java.util.*?>
<?import javafx.scene.*?> <?import javafx.scene.control.*?> <?import
javafx.scene.layout.*?>
<AnchorPane prefHeight="169.0" prefWidth="188.0" xmlns="http://javafx.com/javafx"
xmlns:fx="http://javafx.com/fxml" fx:controller="sample.FinishController">
    <children>
        <Text fx:id="win_lbl" layoutX="75.0" layoutY="55.0" strokeType="OUTSIDE"
            strokeWidth="0.0" text="Text"> <font>
            <Font size="20.0" /> </font>
        </Text>
        <Button fx:id="ok_btn" layoutX="77.0" layoutY="117.0" mnemonicParsing="false"
text="Ok" />
    </children>
</AnchorPane>

```

Результаты тестирования:





Вывод: Освоили приемы разработки оконных клиент-серверных приложений на Java с использованием Сокетов.