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ОТЧЕТ О ПРАКТИЧЕСКОЙ РАБОТЕ № 6

JMS в Spring
тема

Преподаватель

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1 Цель

Ознакомится с механизмом *JMS* в *Spring*.

2 Задание

Изменить приложение из практического задания №6, №5 или №4 (на усмотрение студента) и добавить следующие возможности (пункты со "снежинкой" желательны, но не обязательны):

1) Настроить очередь (Для *ActiveMQ* или любого другого брокера сообщений *JMS*) приема сообщений для администратора.

2) При выполнении операций добавления, удаления или редактирования ресурса через *REST API* / форму создавать соответствующие уведомления и отправлять их в очередь.

3) Любым удобным способом (можно через консоль) продемонстрировать извлечение административных сообщений о выполненных операциях (из п.2).

4) Добавить кнопку-ссылку «купить» на форме. После этого в брокер сообщений отправляется сообщение о том, какой «товар»/сущность хочет купить пользователь.

Вариант 20. Настольная игра.

Для данной работы была модифицирована 6 практическая работа.

В данной работе использовался брокер сообщений, RabbitMQ. Ссылка для скачивания – <https://github.com/rabbitmq/rabbitmq-server/releases/>.

Так же для работы RabbitMQ необходим Erlang, ссылка для скачивания – <https://www.erlang.org>.

Использование RabbitMQ, можно наблюдать в листингах, а именно в листинге 21.

3 Ход выполнения

3.1 Реализация программы

Решение задания, представлено в листингах 1-19.

Листинг 1 – конфигурационный файл pom (pom.xml)

```
<?xml version="1.0" encoding="UTF-8"?>

<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://ma-
ven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>ru.sfu</groupId>
  <artifactId>Lab6</artifactId>
  <version>1.0-SNAPSHOT</version>
  <packaging>war</packaging>

  <name>Lab6 Maven Webapp</name>
  <!-- FIXME change it to the project's website -->
  <url>http://www.example.com</url>

  <properties>
    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
    <maven.compiler.source>1.7</maven.compiler.source>
    <maven.compiler.target>1.7</maven.compiler.target>
    <spring.version>5.3.10</spring.version>
  </properties>

  <dependencies>
    <dependency>
      <groupId>junit</groupId>
      <artifactId>junit</artifactId>
      <version>4.11</version>
      <scope>test</scope>
    </dependency>

    <!-- https://mvnrepository.com/artifact/org.springframework/spring-core -->
    <dependency>
      <groupId>org.springframework</groupId>
```

Продолжение листинга 1

```
        <artifactId>spring-core</artifactId>
        <version>${spring.version}</version>
    </dependency>

    <!-- https://mvnrepository.com/artifact/org.springframework/spring-beans -->
    <dependency>
        <groupId>org.springframework</groupId>
        <artifactId>spring-beans</artifactId>
        <version>${spring.version}</version>
    </dependency>

    <!-- https://mvnrepository.com/artifact/org.springframework/spring-context -->
    <dependency>
        <groupId>org.springframework</groupId>
        <artifactId>spring-context</artifactId>
        <version>${spring.version}</version>
    </dependency>

    <!-- https://mvnrepository.com/artifact/org.springframework/spring-web -->
    <dependency>
        <groupId>org.springframework</groupId>
        <artifactId>spring-web</artifactId>
        <version>${spring.version}</version>
    </dependency>

    <!-- https://mvnrepository.com/artifact/org.springframework/spring-webmvc -->
    <dependency>
        <groupId>org.springframework</groupId>
        <artifactId>spring-webmvc</artifactId>
        <version>${spring.version}</version>
    </dependency>

    <!-- https://mvnrepository.com/artifact/org.thymeleaf/thymeleaf-spring5 -->
    <dependency>
        <groupId>org.thymeleaf</groupId>
        <artifactId>thymeleaf-spring5</artifactId>
        <version>3.0.11.RELEASE</version>
    </dependency>
```

Продолжение листинга 1

```
<!-- https://mvnrepository.com/artifact/org.hibernate.validator/hibernate-
validator -->
<dependency>
  <groupId>org.hibernate.validator</groupId>
  <artifactId>hibernate-validator</artifactId>
  <version>6.1.7.Final</version>
</dependency>

<!-- https://mvnrepository.com/artifact/javax.servlet/javax.servlet-api -->
<dependency>
  <groupId>javax.servlet</groupId>
  <artifactId>javax.servlet-api</artifactId>
  <version>4.0.1</version>
  <scope>provided</scope>
</dependency>

<!-- https://mvnrepository.com/artifact/org.hibernate/hibernate-entityman-
ager -->
<dependency>
  <groupId>org.hibernate</groupId>
  <artifactId>hibernate-entitymanager</artifactId>
  <version>5.5.7.Final</version>
</dependency>

<dependency>
  <groupId>org.springframework</groupId>
  <artifactId>spring-jdbc</artifactId>
  <version>5.2.8.RELEASE</version>
</dependency>

<dependency>
  <groupId>org.springframework.data</groupId>
  <artifactId>spring-data-jpa</artifactId>
  <version>2.3.3.RELEASE</version>
</dependency>

<dependency>
  <groupId>org.postgresql</groupId>
  <artifactId>postgresql</artifactId>
  <version>42.2.15</version>
```

Продолжение листинга 1

```
</dependency>

<dependency>
  <groupId>org.jetbrains</groupId>
  <artifactId>annotations</artifactId>
  <version>RELEASE</version>
  <scope>compile</scope>
</dependency>

<dependency>
  <groupId>org.springframework</groupId>
  <artifactId>spring-context-support</artifactId>
  <version>5.3.10</version>
</dependency>

<dependency>
  <groupId>com.fasterxml.jackson.core</groupId>
  <artifactId>jackson-databind</artifactId>
  <version>2.11.3</version>
</dependency>
</dependencies>

<build>
  <finalName>Lab6</finalName>
  <pluginManagement><!-- lock down plugins versions to avoid using Maven de-
faults (may be moved to parent pom) -->
    <plugins>
      <plugin>
        <artifactId>maven-clean-plugin</artifactId>
        <version>3.1.0</version>
      </plugin>
      <!-- see http://maven.apache.org/ref/current/maven-core/default-bind-
ings.html#Plugin_bindings_for_war_packaging -->
      <plugin>
        <artifactId>maven-resources-plugin</artifactId>
        <version>3.0.2</version>
      </plugin>
      <plugin>
        <artifactId>maven-compiler-plugin</artifactId>
```

Окончание листинга 1

```
        <version>3.8.0</version>
    </plugin>
    <plugin>
        <artifactId>maven-surefire-plugin</artifactId>
        <version>2.22.1</version>
    </plugin>
    <plugin>
        <artifactId>maven-war-plugin</artifactId>
        <version>3.2.2</version>
    </plugin>
    <plugin>
        <artifactId>maven-install-plugin</artifactId>
        <version>2.5.2</version>
    </plugin>
    <plugin>
        <artifactId>maven-deploy-plugin</artifactId>
        <version>2.8.2</version>
    </plugin>
</plugins>
</pluginManagement>
<plugins>
    <plugin>
        <groupId>org.apache.maven.plugins</groupId>
        <artifactId>maven-compiler-plugin</artifactId>
        <configuration>
            <source>8</source>
            <target>8</target>
        </configuration>
    </plugin>
</plugins>
</build>
</project>
```

Листинг 2 – Файл index (index.jsp)

```
<html>
<body>
<h2>Hello!</h2>
<a href="/table_games">Begin to work</a>
</body>
</html>
```


Листинг 3 – Файл web (web.xml)

```
<!DOCTYPE web-app PUBLIC
"-//Sun Microsystems, Inc.//DTD Web Application 2.3//EN"
"http://java.sun.com/dtd/web-app_2_3.dtd" >

<web-app>
  <display-name>Archetype Created Web Application</display-name>
</web-app>
```

Листинг 4 – Файл add (add.html)

```
<!DOCTYPE html>
<html lang="en" xmlns:th="http://thymeleaf.org">
<head>
  <meta charset="UTF-8">
  <title>Add New Game</title>
</head>
<body>
<a href="/table_games">Back</a>
<form th:method="POST" th:action="@{/table_games}" th:object="${game}">
  <label for="gameName">Enter name: </label>
  <input type="text" th:field="*{gameName}" id="gameName"/>
  <div th:if="${#fields.hasErrors('gameName')}" th:errors="*{gameName}">ER-
ROR</div>
  <br/>

  <label for="price">Price </label>
  <input name="price" type="number" id="price"/>
  <div th:if="${#fields.hasErrors('price')}" th:errors="*{price}">ERROR</div>
  <br/>

  <label for="genre">Genre </label>
  <input type="text" th:field="*{genre}" id="genre"/>
  <div th:if="${#fields.hasErrors('genre')}" th:errors="*{genre}">ERROR</div>
  <br/>

  <label for="playerAmount">Player amount </label>
  <input name="playerAmount" type="number" id="playerAmount"/>
  <div th:if="${#fields.hasErrors('playerAmount')}" th:errors="*{playerA-
mount}">ERROR</div>
  <br/>
```

Окончание листинга 4

```
<input type="submit" value="Add game"/>
</form>
</body>
</html>
```

Листинг 5 – Файл edit (edit.html)

```
<!DOCTYPE html>
<html lang="en" xmlns:th="http://thymeleaf.org">
<head>
  <meta charset="UTF-8">
  <title>Edit Game</title>
</head>
<body>
<a href="/table_games">Back</a>
<form th:method="POST" th:action="@{/table_games/edit/{id}(id=${game.getId()})}"
th:object="${game}">
  <label for="idx">ID</label>
  <input th:field="*{id}" type="number" id="idx" disabled/>
  <br/>

  <label for="gameName">Enter name: </label>
  <input type="text" th:field="*{gameName}" id="gameName"/>
  <div th:if="${#fields.hasErrors('gameName')}" th:errors="*{gameName}">ER-
ROR</div>
  <br/>

  <label for="price">Price </label>
  <input th:field="*{price}" type="number" id="price"/>
  <div th:if="${#fields.hasErrors('price')}" th:errors="*{price}">ERROR</div>
  <br/>

  <label for="genre">Genre </label>
  <input type="text" th:field="*{genre}" id="genre"/>
  <div th:if="${#fields.hasErrors('genre')}" th:errors="*{genre}">ERROR</div>
  <br/>

  <label for="playerAmount">Player amount </label>
  <input th:field="*{playerAmount}" type="number" id="playerAmount"/>
  <div th:if="${#fields.hasErrors('playerAmount')}" th:errors="*{playerA-
mount}">ERROR</div>
  <br/>
```

Окончание листинга 5

```
<input type="submit" value="Edit game"/>
</form>

<form th:method="POST" th:action="@{/table_games/delete/{id}(id=${game.getId()})}" th:object="${game}">
    <input type="submit" value="Delete Game"/>
</form>
</body>
</html>
```

Листинг 6 – Файл find (find.html)

```
<!DOCTYPE html>
<html lang="en" xmlns:th="http://www.thymeleaf.org">
<head>
    <meta charset="UTF-8">
    <title>Find</title>
</head>
<body>
<a href="/table_games">Back</a>
<form th:method="GET" th:action="@{/table_games/findGame}">
    <label for="price">Max price</label>
    <input type="number" id="price" name="price"/>
    <br/>
    <input type="submit" value="Find"/>
</form>
</body>
</html>
```

Листинг 7 – Файл menu (menu.html)

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Menu</title>
</head>
<body>
<a href="/table_games/add">Add game</a><br/>
<a href="/table_games/show">Show all games</a><br/>
<a href="/table_games/find">Find games</a><br/>
</body>
</html>
```

Листинг 8 – Файл show (show.html)

```
<!DOCTYPE html>
<html lang="en" xmlns:th="http://www.thymeleaf.org">
<head>
    <meta charset="UTF-8">
    <title>Show</title>
</head>
<body>
    <a href="/table_games">Back</a>
    <div th:each="game : ${games}">
        <a th:href="@{{id}}/edit(id=${game.getId()})"
th:text="${game.toString()}">game</a>
    </div>
</body>
</html>
```

Листинг 9 – Файл showGame (showGame.html)

```
<!DOCTYPE html>
<html lang="en" xmlns:th="http://www.thymeleaf.org">
<head>
    <meta charset="UTF-8">
    <title>th:text="${game.getGameName()}"</title>
</head>
<body>
<a href="/table_games">Back</a>
<p th:text="${game.toString()}">game</p>
</body>
</html>
```

Листинг 10 – Файл application (application.properties)

```
#--- Postgres ---
dataSource.driverClassName =org.postgresql.Driver
jpa.database=POSTGRESQL
dataSource.url=jdbc:postgresql://localhost:5432/lab3_db
dataSource.username=postgres
dataSource.password=qwerty
```

Листинг 11 – Класс DispServletInit(DispServletInit.java)

```
package ru.sfu.config;

import org.springframework.web.servlet.support.AbstractAnnotationConfigDispatch-
erServletInitializer;
```

Окончание листинга 11

```
public class DispServletInit extends AbstractAnnotationConfigDispatcherServlet-
Initializer {

    @Override
    protected Class<?>[] getRootConfigClasses() {
        return new Class[]{DataConfig.class/*, SecurityConfig.class*/};
    }

    @Override
    protected Class<?>[] getServletConfigClasses() {
        return new Class[]{SpringConfig.class};
    }

    @Override
    protected String[] getServletMappings() {
        return new String[]{"/"};
    }
}
```

Листинг 12 – Класс SpringConfig (SpringConfig.java)

```
package ru.sfu.config;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.context.ApplicationContext;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.ComponentScan;
import org.springframework.context.annotation.Configuration;
import org.springframework.web.servlet.config.annotation.EnableWebMvc;
import org.springframework.web.servlet.config.annotation.ViewResolverRegistry;
import org.springframework.web.servlet.config.annotation.WebMvcConfigurer;
import org.thymeleaf.spring5.SpringTemplateEngine;
import org.thymeleaf.spring5.templateresolver.SpringResourceTemplateResolver;
import org.thymeleaf.spring5.view.ThymeleafViewResolver;

@Configuration
//@ComponentScan("ru.sfu.controller")
@ComponentScan({"ru.sfu.*"})
@EnableWebMvc
public class SpringConfig implements WebMvcConfigurer {
    private final ApplicationContext applicationContext;
```

Окончание листинга 12

```
@Autowired
public SpringConfig(ApplicationContext applicationContext) {
    this.applicationContext = applicationContext;
}

@Bean
public SpringResourceTemplateResolver templateResolver() {
    SpringResourceTemplateResolver templateResolver = new SpringResourceTem-
plateResolver();
    templateResolver.setApplicationContext(applicationContext);
    templateResolver.setPrefix("/WEB-INF/views/");
    templateResolver.setSuffix(".html");
    return templateResolver;
}

@Bean
public SpringTemplateEngine templateEngine() {
    SpringTemplateEngine templateEngine = new SpringTemplateEngine();
    templateEngine.setTemplateResolver(templateResolver());
    //templateEngine.addDialect(new SpringSecurityDialect());
    templateEngine.setEnableSpringELCompiler(true);
    return templateEngine;
}

@Override
public void configureViewResolvers(ViewResolverRegistry registry) {
    ThymeleafViewResolver resolver = new ThymeleafViewResolver();
    resolver.setTemplateEngine(templateEngine());
    registry.viewResolver(resolver);
}
}
}
```

Листинг 13 – Класс DataConfig (DataConfig.java)

```
package ru.sfu.config;

import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.ComponentScan;
import org.springframework.context.annotation.Configuration;
import org.springframework.context.annotation.PropertySource;
import org.springframework.core.env.Environment;
import org.springframework.data.jpa.repository.config.EnableJpaRepositories;
```

Продолжение листинга 13

```
import org.springframework.jdbc.datasource.DriverManagerDataSource;
import org.springframework.orm.jpa.JpaTransactionManager;
import org.springframework.orm.jpa.LocalContainerEntityManagerFactoryBean;
import org.springframework.orm.jpa.vendor.HibernateJpaVendorAdapter;
import org.springframework.transaction.PlatformTransactionManager;
import org.springframework.transaction.annotation.EnableTransactionManagement;
import javax.persistence.EntityManagerFactory;
import javax.sql.DataSource;

@Configuration
@EnableTransactionManagement
@ComponentScan("ru.sfu.repository")
@EnableJpaRepositories("ru.sfu.repository")
@PropertySource("classpath:application.properties")
public class DataConfig {

    private final Environment env;

    public DataConfig(Environment env) {
        this.env = env;
    }

    @Bean
    DataSource dataSource() {
        DriverManagerDataSource dataSource = new DriverManagerDataSource();

        dataSource.setDriverClassName(env.getProperty("dataSource.driverClass-
Name"));
        dataSource.setUrl(env.getProperty("dataSource.url"));
        dataSource.setUsername(env.getProperty("dataSource.username"));
        dataSource.setPassword(env.getProperty("dataSource.password"));
        return dataSource;
    }

    @Bean
    public EntityManagerFactory entityManagerFactory() {
        HibernateJpaVendorAdapter vendorAdapter = new HibernateJpaVen-
dorAdapter();
        vendorAdapter.setGenerateDdl(true);
        LocalContainerEntityManagerFactoryBean factory = new
            LocalContainerEntityManagerFactoryBean();
```

Окончание листинга 13

```
        factory.setJpaVendorAdapter (vendorAdapter);
        factory.setPackagesToScan ("ru.sfu");
        factory.setDataSource (dataSource());
        factory.afterPropertiesSet();
        return factory.getObject();
    }

    @Bean
    public PlatformTransactionManager transactionManager() {
        JpaTransactionManager txManager = new JpaTransactionManager();
        txManager.setEntityManagerFactory(entityManagerFactory());
        return txManager;
    }
}
```

Листинг 14 – Класс JmsConfig(JmsConfig.java)

```
package ru.sfu.config;

import org.springframework.amqp.core.AmqpAdmin;
import org.springframework.amqp.core.Queue;
import org.springframework.amqp.rabbit.connection.CachingConnectionFactory;
import org.springframework.amqp.rabbit.core.RabbitAdmin;
import org.springframework.amqp.rabbit.core.RabbitTemplate;
import org.springframework.amqp.support.converter.Jackson2JsonMessageConverter;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;

@Configuration
public class JmsConfig {
    static final String queueName = "tg-queue";

    @Bean
    RabbitTemplate rabbitTemplate() {
        CachingConnectionFactory connectionFactory = new CachingConnectionFactory("localhost", 5672);

        AmqpAdmin admin = new RabbitAdmin(connectionFactory);
        admin.declareQueue(new Queue(queueName));

        RabbitTemplate rabbitTemplate = new RabbitTemplate(connectionFactory);
        rabbitTemplate.setMessageConverter(new Jackson2JsonMessageConverter());
        return rabbitTemplate;
    }
}
```


Листинг 15 – Класс TableGamesController (TableGamesController.java)

```
package ru.sfu.controller;

import org.springframework.stereotype.Controller;
import org.springframework.ui.Model;
import org.springframework.validation.BindingResult;
import org.springframework.web.bind.annotation.*;
import ru.sfu.model.TableGame;
import ru.sfu.repository.TableGameRepository;

import javax.validation.Valid;
import java.util.Optional;

@Controller
@RequestMapping("/table_games")
public class TableGameController {
    private final TableGameRepository repo;

    public TableGameController(TableGameRepository repo) {
        this.repo = repo;
    }

    @GetMapping("/menu")
    public String menu() {
        return "table_games/menu";
    }

    @GetMapping(value =("/{id}")
    public String showGame(@PathVariable("id") int id, Model model) {
        Optional<TableGame> tg = repo.findById(id);
        if (tg.isPresent()) {
            model.addAttribute("game", tg.get());
            return "table_games/showGame";
        }

        return "redirect:/table_games";
    }

    @GetMapping()
```

Продолжение листинга 15

```
public String showGames(Model model){
    model.addAttribute("games", repo.findAll());
    return "table_games/show";
}

@GetMapping("/new")
public String newGame(Model model){
    model.addAttribute("game", new TableGame());
    return "table_games/add";
}

@PostMapping()
public String addGame(@ModelAttribute("game") @Valid TableGame game,
                      BindingResult bindingResult){
    if (bindingResult.hasErrors()){
        return "table_games/add";
    }

    repo.save(game);
    return "redirect:/table_games";
}

@GetMapping("/{id}/edit")
public String editGame(@PathVariable("id") int id, Model model){
    Optional<TableGame> tg = repo.findById(id);
    if (tg.isPresent()){
        model.addAttribute("game", tg.get());
        return "table_games/edit";
    }

    return "redirect:/table_games";
}

@PatchMapping("/{id}")
public String updateGame(@PathVariable("id") int id,
                        @ModelAttribute("game") @Valid TableGame game,
                        BindingResult bindingResult){
```

Окончание листинга 15

```
        if (bindingResult.hasErrors()) {
            return "table_games/edit";
        }
        repo.save(game);
        return "redirect:/table_games";
    }

    @DeleteMapping("/{id}")
    public String deleteGame(@PathVariable("id") int id) {
        if (repo.existsById(id)) {
            repo.deleteById(id);
        }
        return "redirect:/table_games";
    }

    @GetMapping("maxPrice")
    public String findGame(@RequestParam("price") int maxPrice, Model model)
    {
        model.addAttribute("games", repo.findAllByPriceIsLessThanEqual(max-
Price));

        return "/table_games/show";
    }

    @GetMapping("search")
    public String showFoundedGames() {
        return "table_games/find";
    }
}
```

Листинг 16 – Класс TableGame (TableGame.java)

```
package ru.sfu.model;

import javax.persistence.*;
import javax.validation.constraints.Max;
import javax.validation.constraints.Min;
import javax.validation.constraints.NotEmpty;
import javax.validation.constraints.Size;

@Entity
```

Продолжение листинга 16

```
@Table(name = "table_games")
public class TableGame {

    @Id
    @GeneratedValue
    int id;

    @Column(name = "gamename")
    @NotEmpty(message = "Name should not be empty")
    @Size(min = 3, max = 30, message="Name should be between 3 and 30")
    String gameName;

    @Column(name = "price")
    @Min(value = 1, message = "price should be greater than 0")
    @Max(value = 9000, message = "price should be less than 9000")
    int price;

    @Column(name = "playeramount")
    @Min(value = 1, message = "player amount should be greater than 0")
    @Max(value = 20, message = "player amount should be less than 20")
    int playerAmount;

    @Column(name = "genre")
    @NotEmpty(message = "Genre should not be empty")
    @Size(min = 3, max = 30, message="Genre should be between 3 and 30")
    String genre;

    public TableGame() {}

    public TableGame(int id, String gamename, int price, int playerAmount,
String genre) {
        this.id = id;
        this.gameName = gamename;
        this.price = price;
        this.playerAmount = playerAmount;
        this.genre = genre;
    }

    public int getId() {
        return id;
    }
}
```

Окончание листинга 16

```
public void setId(int id) {
    this.id = id;
}
public String getGameName() {
    return gameName;
}
public void setGameName(String gameName) {
    this.gameName = gameName;
}
public int getPrice() {
    return price;
}
public void setPrice(int price) {
    this.price = price;
}

public int getPlayerAmount() {
    return playerAmount;
}

public void setPlayerAmount(int playerAmount) {
    this.playerAmount = playerAmount;
}

public String getGenre() {
    return genre;
}

public void setGenre(String genre) {
    this.genre = genre;
}

@Override
public String toString(){
    return "id: " + id + ", name: " + gameName + ", price: " + price + ",
playersAmount: " + playerAmount + ", genre: " + genre;
}
}
```

Листинг 17 – Класс Message (Message.java)

```
package ru.sfu.model;

import java.io.Serializable;

public class Message implements Serializable {
    private String message;
    private TableGame tableGame;

    public Message(String message, TableGame tableGame) {
        this.message = message;
        this.tableGame = tableGame;
    }

    public Message() {
    }

    public String getMessage() {
        return message;
    }

    public void setMessage(String message) {
        this.message = message;
    }

    public TableGame getTableGame() {
        return tableGame;
    }

    public void setTableGame(TableGame tableGame) {
        this.tableGame = tableGame;
    }
}
```

Листинг 18 – Интерфейс TableGameRepository (TableGameRepository.java)

```
package ru.sfu.repository;

import org.springframework.data.repository.CrudRepository;
import org.springframework.stereotype.Repository;
import ru.sfu.model.TableGame;
```

Окончание листинга 18

```
import java.util.List;
import java.util.Optional;
@Repository
public interface TableGameRepository extends CrudRepository<TableGame, Integer>
{
    List<TableGame> findAllByPriceIsLessThanEqual(int value);
}
```

Листинг 19 – Класс DispatcherConfig (DispatcherConfig.java)

```
package ru.sfu.config;
import org.springframework.web.servlet.support.AbstractAnnotationConfigDispatcherServletInitializer;
public class DispatcherConfig extends
    AbstractAnnotationConfigDispatcherServletInitializer {
    @Override
    protected Class<?>[] getRootConfigClasses() {
        return new Class<?>[] { JmsConfig.class };
    }
    @Override
    protected Class<?>[] getServletConfigClasses() {
        return new Class<?>[] { WebConfig.class };
    }
    @Override
    protected String[] getServletMappings() {
        return new String[] { "/" };
    }
}
```

Листинги 20 – Класс WebConfig (WebConfig.java)

```
package ru.sfu.config;

import org.springframework.context.annotation.Configuration;
import org.springframework.web.servlet.config.annotation.EnableWebMvc;
import org.springframework.web.servlet.config.annotation.WebMvcConfigurer;

@Configuration
@EnableWebMvc
public class WebConfig implements WebMvcConfigurer {
}
```

Листинг 21 – Класс Lab7_reciver/JmsConfig (JmsConfig.java)

```
package ru.sfu.config;

import org.springframework.amqp.rabbit.annotation.EnableRabbit;
import org.springframework.amqp.rabbit.annotation.RabbitListenerConfigurer;
import org.springframework.amqp.rabbit.config.SimpleRabbitListenerContainerFactory;
import org.springframework.amqp.rabbit.connection.CachingConnectionFactory;
import org.springframework.amqp.rabbit.connection.ConnectionFactory;
import org.springframework.amqp.rabbit.listener.RabbitListenerEndpointRegistrar;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.ComponentScan;
import org.springframework.context.annotation.Configuration;
import org.springframework.messaging.converter.MappingJackson2MessageConverter;
import org.springframework.messaging.handler.annotation.support.DefaultMessageHandlerMethodFactory;

@Configuration
@ComponentScan("ru.sfu.*")
@EnableRabbit
public class JmsConfig implements RabbitListenerConfigurer {
    @Override
    public void configureRabbitListeners(RabbitListenerEndpointRegistrar registrar) {
        registrar.setMessageHandlerMethodFactory(myHandlerMethodFactory());
    }

    @Bean
    ConnectionFactory connectionFactory() {
        CachingConnectionFactory connectionFactory =
            new CachingConnectionFactory("localhost", 5672);
        return connectionFactory;
    }

    @Bean
    public SimpleRabbitListenerContainerFactory rabbitListenerContainerFactory()
    {
        SimpleRabbitListenerContainerFactory factory =
            new SimpleRabbitListenerContainerFactory();
        factory.setConnectionFactory(connectionFactory());
        factory.setBatchListener(true);
    }
}
```


Окончание листинга 21

```
        return factory;
    }

    @Bean
    public DefaultMessageHandlerMethodFactory myHandlerMethodFactory() {
        DefaultMessageHandlerMethodFactory factory =
            new DefaultMessageHandlerMethodFactory();
        factory.setMessageConverter(new MappingJackson2MessageConverter());
        return factory;
    }
}
```

Листинг 22 – Класс Receiver (Receiver.java)

```
package ru.sfu.reciever;

import org.springframework.amqp.rabbit.annotation.RabbitListener;
import org.springframework.stereotype.Component;
import ru.sfu.model.Message;

@Component
public class Receiver {
    @RabbitListener(queues = "tg-queue", containerFactory =
        "rabbitListenerContainerFactory")
    public void listen(Message message) {
        System.out.println(message.getMessage() + message.getTableGame().getId());
    }
}
```

3.2 Демонстрация работы программы

Демонстрация проделанной работы представлена на рисунках 1-8.

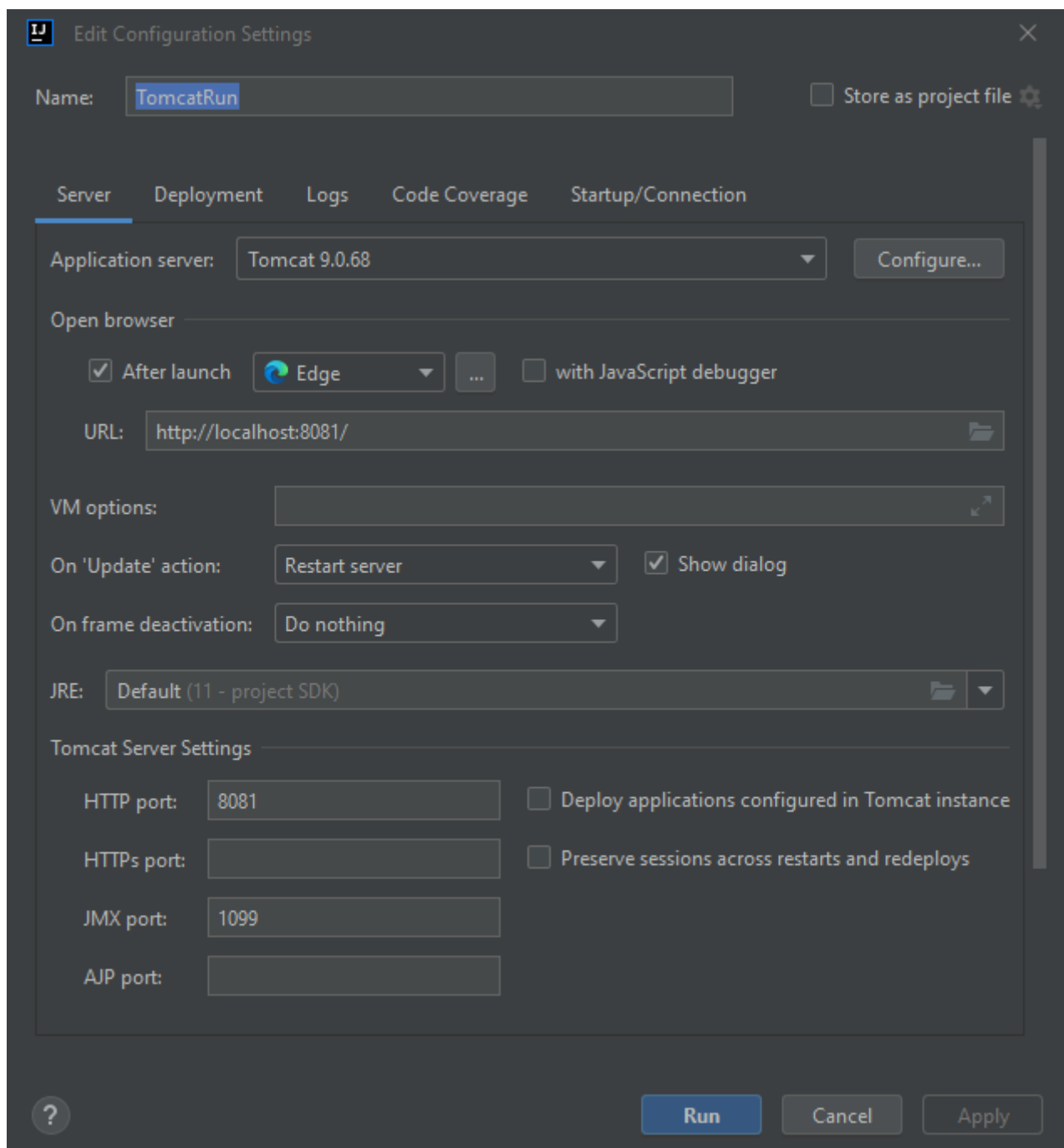


Рисунок 1 – Настройка Tomcat

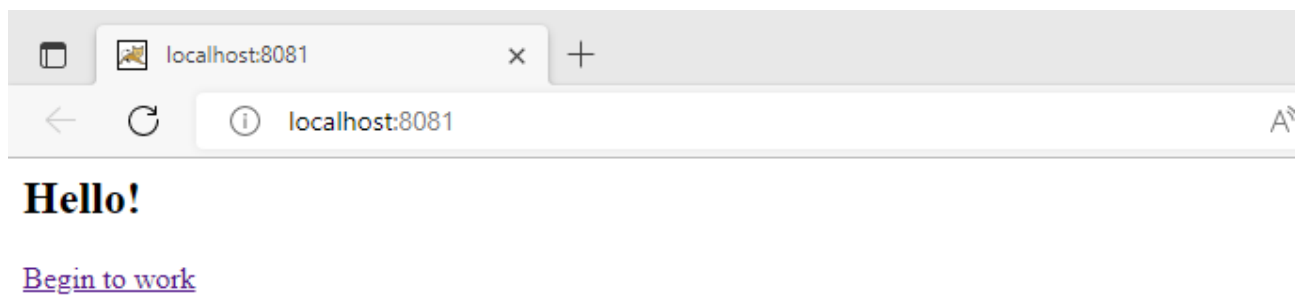


Рисунок 2 – Главная страница

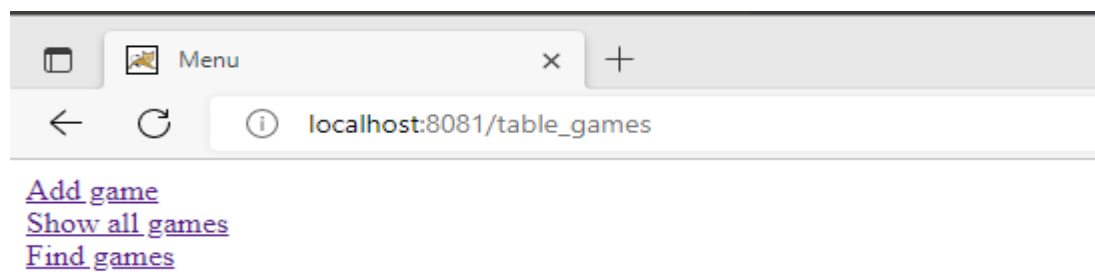


Рисунок 3 – Страница меню

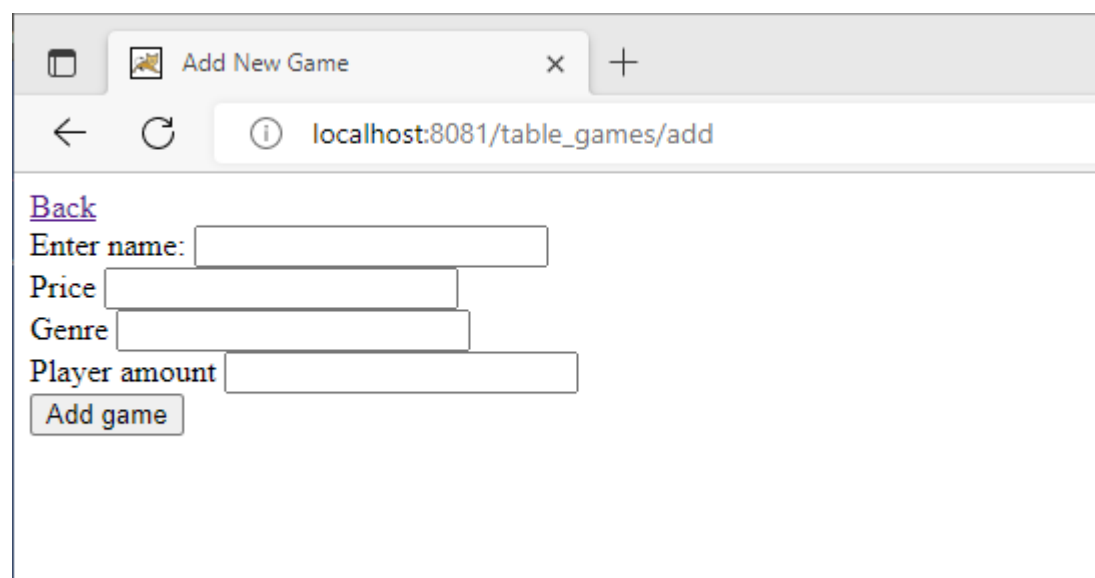


Рисунок 4 – Страница добавления новой записи

[Back](#)
[id: 14, name: NewNameName, price: 52, playersAmount: 20, genre: fantasy](#)

[id: 3, name: tttt, price: 10, playersAmount: 2, genre: rrr](#)

[id: 5, name: Reet, price: 32, playersAmount: 12, genre: yyyy](#)

[id: 4, name: ggg, price: 66, playersAmount: 12, genre: godgamersacademy](#)

[id: 7, name: aaaaaa, price: 30, playersAmount: 5, genre: rrrrr](#)

[id: 6, name: some name, price: 10, playersAmount: 14, genre: some genre](#)

[id: 9, name: rrrrrrr, price: 12, playersAmount: 4, genre: qwqwq](#)

[id: 19, name: qqqq, price: 50, playersAmount: 12, genre: rrrrr](#)

[id: 20, name: qqqq, price: 50, playersAmount: 12, genre: rrrrr](#)

[id: 21, name: lab7-game, price: 77, playersAmount: 18, genre: kis](#)

[id: 22, name: Game7, price: 77, playersAmount: 17, genre: ewrfdsf](#)

[id: 15, name: NewName7, price: 27, playersAmount: 10, genre: wer20](#)

[id: 23, name: lab7, price: 70, playersAmount: 5, genre: retefe](#)

[id: 16, name: game16, price: 16, playersAmount: 2, genre: genre16](#)

[id: 17, name: Monopol, price: 10000, playersAmount: 20, genre:](#)

[id: 26, name: ????, price: 6990, playersAmount: 3, genre: ???](#)

[id: 27, name: ???, price: 4643, playersAmount: 4, genre: ???](#)

[id: 28, name: Gfdg, price: 435, playersAmount: 2, genre: gfdg](#)

[id: 29, name: Monopol23, price: 1244, playersAmount: 4, genre: economic](#)

[id: 30, name: ?????, price: 5000, playersAmount: 5, genre: logik](#)

[id: 18, name: MonopolyaX, price: 23, playersAmount: 12, genre: City](#)

Рисунок 5 – Страница просмотра, покупки, изменения записей

Edit Game

×

+

←

↺

localhost:8081/table_games/3/edit

[Back](#)
ID
Enter name:
Price
Genre
Player amount

Рисунок 6 – Страница редактирования и удаления записи

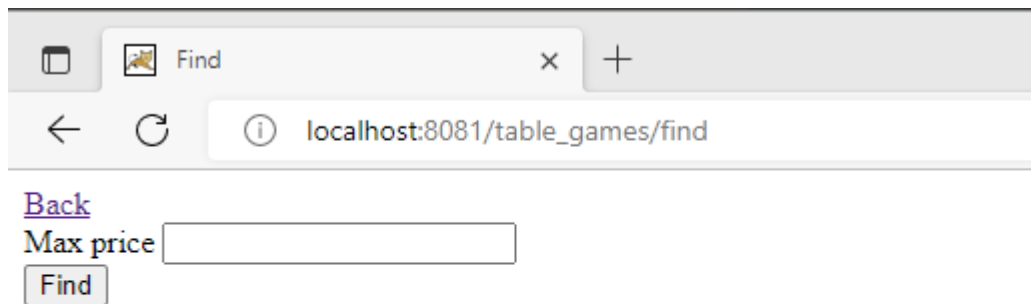


Рисунок 7 – Страница поиска записи по критерию максимальной цены

```
The buyer wants to buy: 14
The buyer wants to buy: 3
The buyer wants to buy: 5
Edited: 4
Edited: 20
Deleted: 16
Deleted: 21
[2022-11-28 11:58:11,870] Artifact Lab7_reciver:war exploded: Artifact is deployed successfully
[2022-11-28 11:58:11,870] Artifact Lab7_reciver:war exploded: Deploy took 3,636 milliseconds
```

Рисунок 8 – Вывод сообщения у получателя

Вывод

В результате проделанной практической работы была выполнена следующая задача:

- были ознакомлены с механизмом *JMS* в *Spring*.