Code Refactoring Report (Issue #557)

Project Overview

This document provides a comprehensive summary of the refactoring activities performed on a veterinary clinic management system that involves Spring Boot, JUnit, HTML, JavaScript, and Thymeleaf. The goal of the refactoring process was to enhance the overall code quality by improving readability, maintainability, error handling, and documentation without changing the underlying functionality.

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1. Medical Records Controller
Refactoring Summary:

- **Controller Refactoring:** The MedicalRecordsController was refactored to improve separation of concerns and readability. Business logic previously handled within the controller was delegated to service layers.
- **Service Dependencies:** Autowired services (e.g., MedicalHistoryService, PetService, FileGenerationService) were clearly defined to manage specific tasks such as managing medical history, generating files, handling physical exams, and interacting with user information.
- **Javadoc Comments:** Comprehensive Javadoc comments were added to each method to ensure better understanding for other developers and for future reference.
- **Helper Methods:** Common logic (such as seeding data for physical exams, vaccinations, and weight records) was extracted into helper methods like seedPhysicalExams(), seedVaccinations(), and seedWeightRecords(). This reduced code repetition and increased maintainability.
- **Code Comments:** In-line comments were added, especially in areas dealing with data generation and file handling, to clarify the purpose of complex blocks of code.
- **Error Handling:** The error handling process was enhanced to ensure proper responses to different errors. In methods such as uploadMedicalRecord(), exceptions are now caught, logged, and appropriate HTTP status codes are returned.

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2. Veterinarian Controller

- **Javadoc Comments:** Each method in the VeterinarianController received detailed Javadoc comments explaining its inputs, outputs, and general purpose.
- **Inline Code Comments:** In sections involving more complex logic (such as clinic assignment and veterinarian login), additional comments were inserted to explain the flow of operations and decision-making.
- **Code Consistency:** Indentation and formatting were made consistent across the entire controller for better readability and maintainability.
- **Original Functionality Retained:** Despite the addition of comments, the core functionality of the controller was retained. This ensures that while the code is easier to read, it continues to work as expected.

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3. Model: Medical History

The MedicalHistory class represents the medical records for a pet. Key attributes include:

- **Practitioner**: The medical professional responsible for the treatment.
- **Treatment**: A description of the treatment administered.
- **Veterinarian**: The veterinarian involved in the case.
- **Event Date**: The date of the medical event.
- **Prescription**: (Optional) References to associated prescriptions.

Refactoring Summary:

- **Javadoc Comments:** Added comprehensive documentation for the class and each field.
- **Inline Comments:** Critical areas, such as the constructor logic, received comments explaining their functionality, especially how prescriptions are automatically associated with medical history.
- **Code Readability:** These changes improved the clarity of the class without altering its functionality.

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4. Model: Pet

The Pet class models key attributes related to a pet, such as name, species, breed, microchipping status, and more. This class maps to the pet

table in the database and establishes relationships with the User (owner) and Appointment entities.

Key Refactorings:

- **Javadoc and Inline Comments:** Detailed Javadoc comments were added to the class, constructor, and methods. Inline comments clarified the significance of each field.
- **New Method (getAge())**: A new method to calculate the pet's age based on the dateOfBirth field was introduced. This encapsulates common age-related logic in one place for better usability.

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5. Model: Physical Exam

The PhysicalExam class is an entity tied to the physical_exam table in the database.

Refactoring Highlights:

- **Javadoc and Inline Comments:** Javadoc comments were added for the class, fields, and constructors. Inline comments explain the purpose of each attribute and the class' relationship with other entities like Pet and MedicalHistory.
- **Field-Level Comments:** Each field now includes documentation explaining its role and mapping.

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6. Model: Treatment Plan

The TreatmentPlan class encapsulates details related to a pet's treatment, including associations with Pet and MedicalHistory entities.

Refactoring Focus:

- **Detailed Documentation:** Each field and method in the TreatmentPlan class is well-documented, providing clear explanations of its purpose and use.
- **Consistency:** The refactoring ensures a uniform approach to class documentation, improving code maintainability and developer understanding.

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7. Model: Vaccination

The Vaccination class tracks vaccinations for pets, including the vaccine name, date administered, next due date, and associations with Pet and MedicalHistory.

Key Improvements:

- **Javadoc and Inline Comments:** The class and methods received thorough documentation to ensure clarity and maintainability.
- **Field-Level Documentation:** Each attribute now has comments detailing its role in the vaccination process.

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8. Model: Weight Record
The WeightRecord class tracks a pet's weight over time, optionally linking it to medical history if relevant.
Key Improvements:

- **Documentation:** Javadoc comments explain the class, fields, and relationships with other entities.
- **Inline Comments:** In-line comments added clarity to each attribute and how it relates to the database structure.

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9. Repositories
Repositories for models like Pet, MedicalHistory, PhysicalExam, and others were updated as follows:

- **Class-Level Javadoc:** Each repository class now has a detailed description explaining its purpose.
- **Method-Level Javadoc:** Methods like findByPetIdOrderByEventDateDesc and findByPetId received detailed Javadoc comments explaining their purpose and parameters.

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10. Services
The service layer, including classes like FileGenerationService, MedicalHistoryService, and PetService, was refactored to ensure better documentation and maintainability.
Key Refactorings:

- **Javadoc for Each Method:** Public methods in services like FileGenerationService now have Javadoc explaining their parameters and return values.
- **Private Helper Methods:** Repetitive code (e.g., for adding logos or titles to generated files) was refactored into private methods for reusability.
- **Consistency Across Services:** A uniform approach was adopted for method documentation and exception handling across all services.

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11. JavaScript and HTML

- **medical-records.js Improvements:** Each function in medical-records.js was documented using a format similar to Javadoc, explaining its purpose, inputs, and outputs. Inline comments were added to clarify more complex logic.
- **HTML File Comments:** HTML files such as home.html, medical-records.html, and vet-dashboard.html received comments explaining the purpose of key sections, including navigation bars, content fragments, and form input handling.

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12. Conclusion

This refactoring effort has improved the clarity, maintainability, and overall quality of the system's codebase. The addition of Javadoc comments, extraction of reusable methods, and general code cleanup ensure that future developers will have an easier time understanding and working with the code. The focus on error handling and separation of concerns also enhances the robustness of the system.

THANK YOU FOR READING!!