BIBLIOTHEK

KÜTÜPHANE OTOMASYON SİSTEMİ

KİTAPLARIN DÜNYASINDA YOL ARKADAŞINIZ

29.08.2024

Projenin Amacı ve Kapsamı

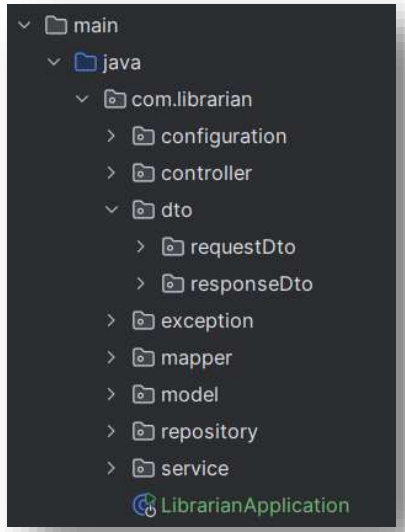
Amacı

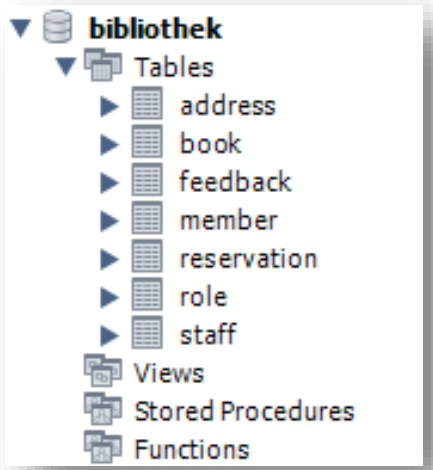
Bibliothek, bir kütüphane yönetim sistemi olarak, kitapların, üyelerin ve ödünç işlemlerinin etkili bir şekilde yönetilmesini amaçlar.

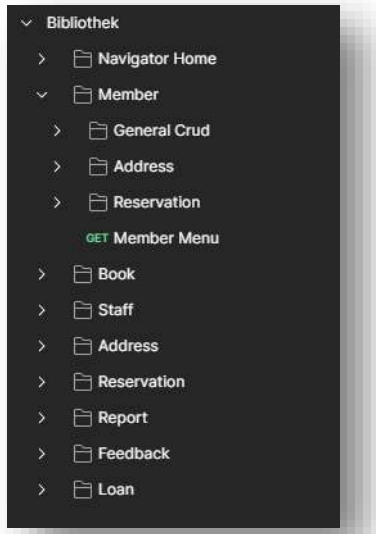
Kapsamı

- Kitap Yönetimi: Kitap ekleme, güncelleme, silme işlemleri.
- Üye Yönetimi: Üye kayıtları, güncellemeler ve silme işlemleri.
- Ödünç ve Rezervasyon İşlemleri: Kitap ödünç alma, iade ve rezervasyon işlemleri.
- Geri Bildirim: Kullanıcılardan gelen geri bildirimlerin toplanması ve yönetilmesi.
- Raporlama: En çok alınan kitapları sıralama ve seçili id'deki rezervasyonu detaylı raporlama.

Kullanılan Teknolojiler





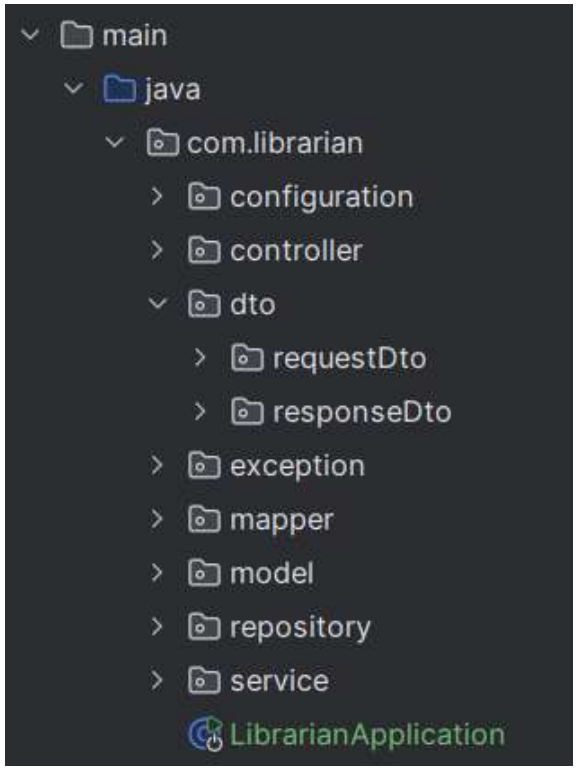


Intellij IDEA

MySQL

Postman

Kod Yapısı ve Bileşenler - Paketler



- **Configuration:** Uygulama yapılandırma ayarları.
- **Controller:** HTTP isteklerini işleyen sınıflar.
- **DTO:** Veri taşıma nesneleri.
- **Exception:** Hata işleme ve özelleştirilmiş istisnalar.
- **Mapper:** Veri dönüşüm işlemleri.
- **Model:** Veritabanı tablolarını temsil eden sınıflar, entityler.
- **Repository:** Veritabanı, CRUD ve JPA işlemleri.
- **Service:** Business ve uygulama içi işlemler.

Paketler – Model (Entities)

```java
@Entity  new *
@Data
@Table(name = "book")
public class Book {

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    private Long id;

    @Column(length = 36, nullable = false,
            unique = true)
    private UUID isbn;

    @Column(nullable = false)
    private String title;

    @Column(nullable = false)
    private String author;

    @Column(nullable = false)
    private String category;

    @Column(nullable = false)
    private int publicationYear;

    @OneToMany(mappedBy = "book")
    @JsonManagedReference
    private List<Feedback> feedbacks;

    private int timesLoaned;
}
```

Book Entity

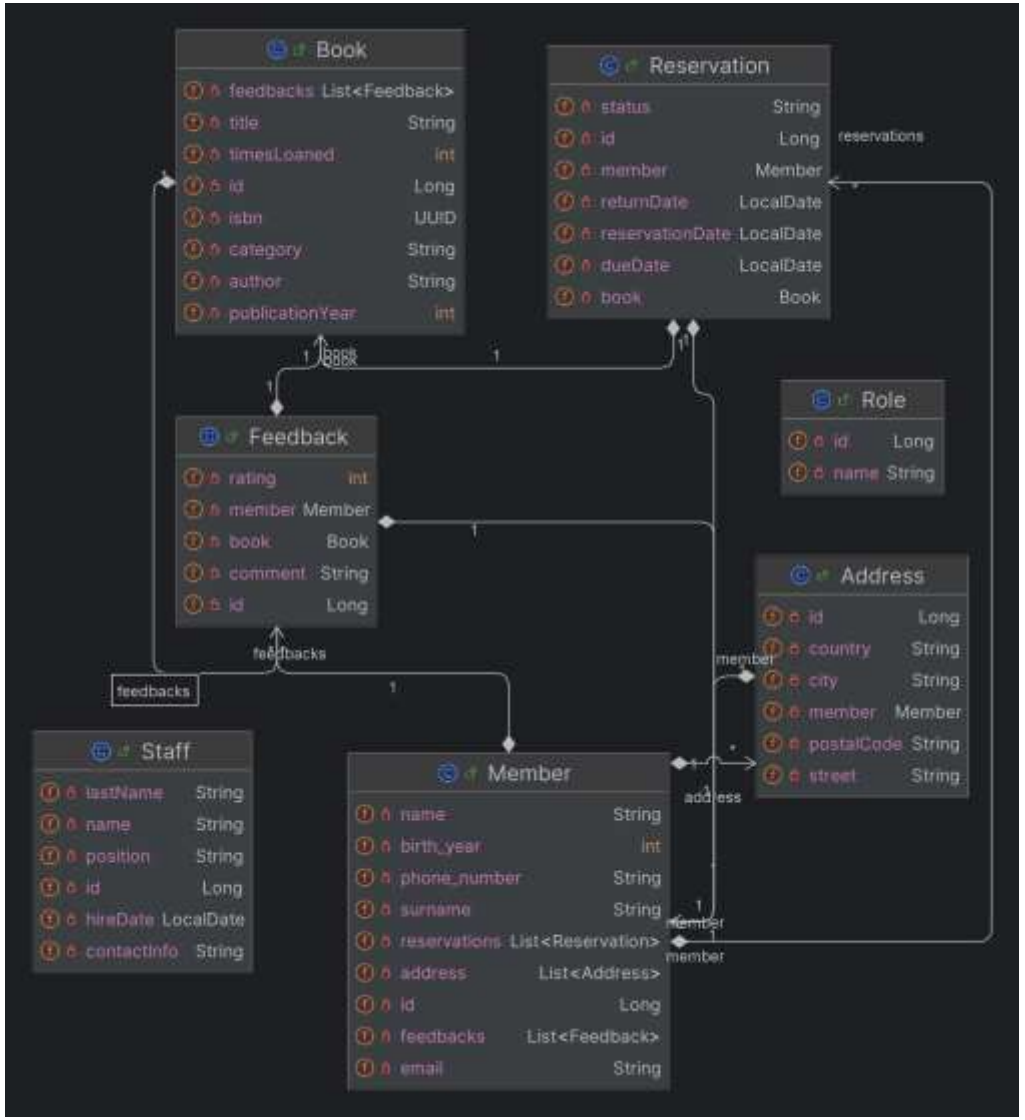
```java
@Entity  new *
@Table(name = "member")
@Data
public class Member {
    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    private Long id;

    @Column(nullable = false)
    private String name;

    @Column(nullable = false)
    private String surname;

    @Column(nullable = false)
    private String email;

    @Column(nullable = false, name = "phone_number")
    private String phone_number;

    @Column(nullable = false, name = "birth_year")
    private int birth_year;

    @OneToMany(mappedBy = "member", cascade = CascadeType.ALL,
            orphanRemoval = true, fetch = FetchType.EAGER)
    @JsonManagedReference
    @JsonIgnore
    private List<Address> address;

    @OneToMany(mappedBy = "member", cascade = CascadeType.ALL,
            orphanRemoval = true)
    @JsonIgnore
    private List<Reservation> reservations;

    @OneToMany(mappedBy = "member")
    @JsonIgnore
    private List<Feedback> feedbacks;

}
```

Member Entity

```java
@Data  new *
@Entity
@Table(name = "reservation")
public class Reservation {

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    private Long id;

    @ManyToOne(fetch = FetchType.EAGER)
    @JoinColumn(name = "book_id")
    private Book book;

    @ManyToOne
    @JoinColumn(name = "member_id")
    private Member member;

    @Column(name = "loan_date")
    @JsonFormat(shape = JsonFormat.Shape.STRING,
            pattern = "yyyy-MM-dd")
    private LocalDate reservationDate;

    @Column(name = "due_date")
    @JsonFormat(shape = JsonFormat.Shape.STRING,
            pattern = "yyyy-MM-dd")
    private LocalDate dueDate;

    @Column(name = "return_date")
    @JsonFormat(shape = JsonFormat.Shape.STRING,
            pattern = "yyyy-MM-dd")
    private LocalDate returnDate;

    @Column(nullable = false)
    private String status;

}
```

Reservation Entity

ER (Varlık-İlişki) Diyagramı



Member Entity - Kod Örnekleri

Controller Layer

```java
@PostMapping("/{memberId}/addReservation") new *
public ResponseEntity<String> addReservation(@PathVariable Long memberId,
                                             @RequestBody ReservationSaveRequestDto reservationSaveRequestDto) {
    try {
        boolean isAdded = memberService.addReservation(memberId, reservationSaveRequestDto);
        if (isAdded) {
            return ResponseEntity.ok( body: "Reservation added successfully");
        } else {
            return ResponseEntity.status(HttpStatus.BAD_REQUEST).body("Failed to add reservation");
        }
    } catch (RuntimeException e) {
        return ResponseEntity.status(HttpStatus.NOT_FOUND).body(e.getMessage());
    }
}
```

```java
@PostMapping("/{memberId}/addAddress") new *
public ResponseEntity<MemberGetResponseDto> addAddressToMember(
        @PathVariable Long memberId,
        @RequestBody Address address) {
    Member member = memberService.addAddressToMember(memberId, address);
    MemberGetResponseDto responseDto = modelMapper.map(member,
            MemberGetResponseDto.class);
    return ResponseEntity.ok(responseDto);
}
```

Service Layer

```java
@Transactional* 1 usage new *
public boolean addReservation(Long memberId, ReservationSaveRequestDto reservationSaveRequestDto) {
    Member member = memberRepository.findById(memberId)
            .orElseThrow(() -> new RuntimeException("Member not found"));

    Book book = bookRepository.findById(reservationSaveRequestDto.getBookId())
            .orElseThrow(() -> new RuntimeException("Book not found"));

    Reservation reservation = new Reservation();
    reservation.setBook(book);
    reservation.setMember(member);
    reservation.setReservationDate(reservationSaveRequestDto.getReservationDate());
    reservation.setDueDate(reservationSaveRequestDto.getDueDate());
    reservation.setReturnDate(reservationSaveRequestDto.getReturnDate());
    reservation.setStatus(reservationSaveRequestDto.getStatus());

    reservationRepository.save(reservation);
    return true;
}
```

```java
@Transactional* 1 usage new *
public Member addAddressToMember(Long memberId, Address address) {
    Member member = memberRepository.findById(memberId)
            .orElseThrow(() -> new RuntimeException("Member not found"));

    member.getAddress().add(address);
    address.setMember(member);

    return memberRepository.save(member);
}
```

Kitap Rezervasyonu (Loan)

Adres Ekleme

* @Transactional, bir işlemdeki tüm veritabanı değişikliklerinin tutarlı bir şekilde gerçekleştirilmesini sağlar. İşlem sırasında bir hata oluşursa, yapılan değişiklikler geri alınır ve veri bütünlüğü korunur.

Raporlama

Constructor Injection

```java
@RestController  new *
@RequestMapping("/report")
@RequiredArgsConstructor
public class ReportController {

    private final ReportService reportService;

    @GetMapping("/loans")  new *
    public List<Reservation> getLoanReports() {
        return reportService.getLoanReports();
    }

    @GetMapping("/popular-books")  new *
    public List<Book> getPopularBooks() {
        return reportService.getPopularBooks();
    }
}
```

Report Controller Layer

```java
@Service  2 usages  new *
@RequiredArgsConstructor
public class ReportService {

    private final ReservationRepository reservationRepository;
    private final BookRepository bookRepository;

    public List<Reservation> getLoanReports() {  1 usage  new *
        return reservationRepository.findAll();
    }

    public List<Book> getPopularBooks() {  1 usage  new *
        List<Reservation> reservations = reservationRepository.findAll();

        Map<Long, Long> bookLoanCounts = reservations.stream()
                .collect(Collectors.groupingBy(
                        reservation -> reservation.getBook().getId(),
                        Collectors.counting()));

        List<Book> books = bookRepository.findAll();
        for (Book book : books) {
            Long loanCount = bookLoanCounts.getOrDefault(book.getId(),
                    defaultValue: 0L);
            book.setTimesLoaned(loanCount.intValue());
        }

        return books.stream()
                .sorted((b1, b2) -> Integer.compare(b2.getTimesLoaned(),
                        b1.getTimesLoaned()))
                .limit( maxSize: 5)
                .collect(Collectors.toList());
    }
}
```

Report Service Layer

- Tüm rezerve işlem verilerini detaylı olarak raporlama
- Tüm kitap rezervasyonu verilerini çekme
- Kitapları özetleyerek her bir kitabın kaç kez ödünç alındığını (veya rezerve edildiğini) hesaplama
- Tüm kitap verilerini çekme
- En popüler (en çok rezerve edilen ve ödünç alınan) kitapları azalan şeklinde sıralama.

Book Entity - Kod Örnekleri

Save Function

```java
@PostMapping("/saveBook")  new *
public ResponseEntity<Boolean> saveBook(
        @RequestBody BookSaveRequestDto bookSaveRequestDto){
    Boolean savedBook = bookService.saveBook(bookSaveRequestDto);
    return new ResponseEntity<>(savedBook, HttpStatus.CREATED);
}
```

```java
public boolean saveBook(BookSaveRequestDto bookSaveRequestDto){
    Book book = modelMapper.map(bookSaveRequestDto,Book.class);
    bookRepository.save(book);
    return true;
}
```

Update Function

```java
@PutMapping("/updateById/{bookId}")  new *
public ResponseEntity<Book> updateBook(
        @PathVariable Long bookId,
        @RequestBody BookUpdateRequestDto bookUpdateRequestDto){

    Book updatedBook = bookService.updateBook(bookId,
            bookUpdateRequestDto);
    if (updatedBook != null) {
        return ResponseEntity.ok(updatedBook);
    } else {
        return ResponseEntity.notFound().build();
    }
}
```

```java
public Book updateBook(Long bookId,  1 usage  new *
                       BookUpdateRequestDto bookUpdateRequestDto) {
    Book existingBook = bookRepository.findById(bookId).orElse( other: null);

    if (existingBook != null) {
        existingBook.setTitle(bookUpdateRequestDto.getTitle());
        existingBook.setAuthor(bookUpdateRequestDto.getAuthor());
        existingBook.setCategory(bookUpdateRequestDto.getCategory());
        return bookRepository.save(existingBook);
    } else {
        return null;
    }
}
```

Search Function

```java
@GetMapping("/search")  new *
public List<Book> searchBooks(@RequestParam String title) {
    return bookService.searchBooksByTitle(title);
}
```

```java
public List<Book> searchBooksByTitle(String title) {  1 usage  new *
    return bookRepository.findByTitleContainingIgnoreCase(title);
}
```

Book Controller Layer

Book Service Layer

Feedback Sistemi

```java
@PostMapping("/add/{bookId}/{memberId}") new *
public FeedbackGetResponseDto addFeedback(
        @PathVariable Long bookId,
        @PathVariable Long memberId,
        @RequestBody FeedbackGetResponseDto feedbackDto) {
    return feedbackService.saveFeedback(bookId, memberId,
            feedbackDto);
}

@GetMapping("/book/{bookId}") new *
public List<FeedbackGetResponseDto> getFeedbacksByBook(
                                @PathVariable Long bookId) {
    return feedbackService.getFeedbacksByBook(bookId);
}

@GetMapping("/member/{memberId}") new *
public List<FeedbackGetResponseDto> getFeedbacksByMember(
                                @PathVariable Long memberId) {
    return feedbackService.getFeedbacksByMember(memberId);
}
```

Feedback Controller Layer

- User feedback'i kaydetme
- Seçili kitabın feedbacklerini alma
- Seçili üyenin yaptığı feedbackleri alma

```java
public FeedbackGetResponseDto saveFeedback(Long bookId, Long memberId, 1 usage new *
                                           FeedbackGetResponseDto feedbackDto) {
    Book book = bookRepository.findById(bookId)
            .orElseThrow(() -> new RuntimeException("Book not found"));
    Member member = memberRepository.findById(memberId)
            .orElseThrow(() -> new RuntimeException("Member not found"));

    Feedback feedback = feedbackMapper.toEntity(feedbackDto);
    feedback.setBook(book);
    feedback.setMember(member);
    Feedback savedFeedback = feedbackRepository.save(feedback);
    return feedbackMapper.toDto(savedFeedback);
}

public List<FeedbackGetResponseDto> getFeedbacksByBook(Long bookId) { 1 usage new *
    return feedbackRepository.findAll().stream() Stream<Feedback>
            .filter(fb -> fb.getBook().getId().equals(bookId))
            .map(feedbackMapper::toDto) Stream<FeedbackGetResponseDto>
            .collect(Collectors.toList());
}

public List<FeedbackGetResponseDto> getFeedbacksByMember(Long memberId) { 1 usage new *
    return feedbackRepository.findAll().stream() Stream<Feedback>
            .filter(fb -> fb.getMember().getId().equals(memberId))
            .map(feedbackMapper::toDto) Stream<FeedbackGetResponseDto>
            .collect(Collectors.toList());
}
```

Feedback Service Layer

Caching

```java
import org.springframework.cache.annotation.EnableCaching;

@SpringBootApplication  new *
@EnableCaching
public class LibrarianApplication {

    public static void main(String[] args) {  new *
        System.out.println("Welcome to the Bibliothek.com\n" +
                "A Contemporary Place to Find Books Written for You!");
        SpringApplication.run(LibrarianApplication.class, args);
    }

}
```

@EnableCaching, Spring Boot uygulamalarında önbellekleme (caching) mekanizmasını etkinleştirir. Bu sayede, sık kullanılan veriler bellekte saklanarak, performans artırılır ve veri tabanı veya diğer yavaş kaynaklara yapılan çağrılar azaltılır.

KAYNAK KODU VE REFERANSLAR

Source Code

- gramchelle/Bibliothek

Requests Documentation

Tüm cURL'ler ve örnek Request Body'ler aşağıdaki linkte temin edilmiştir.

- https://documenter.getpostman.com/view/37170721/2sAXjGcDyr

Image References:

- Open book
- Postman
- Mysql
- IntelliJ_IDEA

Dinlediğiniz İçin Teşekkürler

Özlem Nur Duman