Java Spring Boot Developer Assessment: Ministry Records Management System

Background

The Ministry of Public Administration is implementing a Records Management System to digitize and streamline document handling across departments. You are tasked with developing a core microservice that manages document metadata and tracks document workflow states.

Requirements

Data Model

Create a data model that represents the following entities and their relationships:

1. **Department**
    - ID (auto-generated)
    - Department code (unique)
    - Department name
    - Description
    - Active status
2. **Document**
    - ID (auto-generated)
    - Document number (unique, follows pattern: [DEPT_CODE]-[YYYY]-[SEQUENCE])
    - Title
    - Description
    - Creation date
    - Owner department (reference to Department)
    - Document type (MEMO, LETTER, REPORT, POLICY, ORDER)
    - Security classification (PUBLIC, INTERNAL, CONFIDENTIAL, RESTRICTED)
    - Digital file location (URL/path)
    - Version (major.minor format, starts at 1.0)
3. **DocumentWorkflow**
    - ID (auto-generated)
    - Document (reference to Document)
    - Current state (DRAFT, REVIEW, APPROVED, PUBLISHED, ARCHIVED)
    - Last modified date
    - Last modified by (user ID)
    - Comments
4. **Approval**
    - ID (auto-generated)
    - Document workflow (reference to DocumentWorkflow)
    - Approver department (reference to Department)
    - Approval status (PENDING, APPROVED, REJECTED)
    - Approval date
    - Approver ID

   - Comments

Technical Requirements

1. Create a Spring Boot application with appropriate configuration
2. Implement JPA entities with proper relationships, constraints, and validations
3. Create repositories with at least one custom query method that uses JPQL
4. Implement a service layer with business logic
5. Create a RESTful API endpoint for document search with the following capabilities:
   - Search documents by various criteria including:
     - Document number (exact or partial match)
     - Title (contains)
     - Department code
     - Document type
     - Security classification
     - Current workflow state
     - Creation date range
     - Advanced: Documents pending approval by a specific department
   - Support pagination and sorting
   - Return appropriate data with proper DTOs

Submission Guidelines

1. Provide the complete source code via a Git repository
2. Include a README with:
   - Setup instructions
   - API documentation or examples
   - Any assumptions made
   - Design decisions

Time Limit: 3 hours

Document Search API Contract

Endpoint

```
GET /api/v1/documents/search
```

Request Parameters

All parameters are optional and can be combined for advanced filtering.

Parameter	Type	Description	Example
documentNumber	String	Full or partial document number	"FIN-2025-"
title	String	Partial match on document title	"Budget"

departmentCode	String	Department code	"FIN"
documentType	Enum	Type of document	"REPORT"
securityClassification	Enum	Security level	"CONFIDENTIAL"
workflowState	Enum	Current workflow state	"REVIEW"
createdFrom	LocalDate	Start date for creation date range	"2025-01-01"
createdTo	LocalDate	End date for creation date range	"2025-04-30"
pendingApprovalByDepartment	String	Department code for pending approvals	"LEGAL"
page	Integer	Page number (zero-based)	0
size	Integer	Page size	20
sort	String	Sort field and direction	"creationDate,desc"

Response Format

Success Response (200 OK)

```
{
  "content": [
    {
      "id": "123e4567-e89b-12d3-a456-426614174000",
      "documentNumber": "FIN-2025-00042",
      "title": "Q1 Budget Analysis Report",
      "description": "Quarterly budget analysis for Q1 2025",
      "creationDate": "2025-04-15",
      "department": {
        "id": "987e6543-e21b-12d3-a456-426614174000",
        "code": "FIN",
        "name": "Finance Department"
      },
      "documentType": "REPORT",
      "securityClassification": "INTERNAL",
      "version": "1.0",
      "workflow": {
        "currentState": "REVIEW",
        "lastModifiedDate": "2025-04-16T14:30:00",
        "lastModifiedBy": "user123"
      },
      "pendingApprovals": [
        {
          "departmentCode": "LEGAL",
          "departmentName": "Legal Department",
          "status": "PENDING"
        },
        {
          "departmentCode": "EXEC",
          "departmentName": "Executive Office",
          "status": "PENDING"
        }
      ]
    }
    // More documents
  ],
  "pageable": {
    "pageNumber": 0,
    "pageSize": 20,
    "sort": [
      {
        "direction": "DESC",
        "property": "creationDate"
      }
    ]
  },
  "totalElements": 42,
  "totalPages": 3,
  "last": false,
  "first": true,
  "size": 20,
  "number": 0,
  "numberOfElements": 20,
  "empty": false
}
```

Error Responses

400 Bad Request

```
{
  "timestamp": "2025-05-02T10:15:30.123Z",
  "status": 400,
  "error": "Bad Request",
  "message": "Invalid parameter value",
  "details": [
    {
      "field": "documentType",
      "message": "Must be one of [MEMO, LETTER, REPORT, POLICY, ORDER]"
    }
  ],
  "path": "/api/v1/documents/search"
}
```

401 Unauthorized

```json
{
  "timestamp": "2025-05-02T10:15:30.123Z",
  "status": 401,
  "error": "Unauthorized",
  "message": "Authentication required",
  "path": "/api/v1/documents/search"
}
```

403 Forbidden

```json
{
  "timestamp": "2025-05-02T10:15:30.123Z",
  "status": 403,
  "error": "Forbidden",
  "message": "Insufficient permissions to access documents with RESTRICTED classification",
  "path": "/api/v1/documents/search"
}
```

500 Internal Server Error

```json
{
  "timestamp": "2025-05-02T10:15:30.123Z",
  "status": 500,
  "error": "Internal Server Error",
  "message": "An unexpected error occurred",
  "path": "/api/v1/documents/search"
}
```

Request Examples

Basic Search by Title

```
GET /api/v1/documents/search?title=Budget&page=0&size=10
```

Advanced Search with Multiple Criteria

```
GET /api/v1/documents/search?departmentCode=FIN&documentType=REPORT&workflowState=REVIEW&createdFrom=2025-01-01&createdTo=2025-04-30&sort=creationDate,desc
```

Search for Pending Approvals

```
GET /api/v1/documents/search?pendingApprovalByDepartment=LEGAL&page=0&size=20
```