

# Lab7: SPRING BOOT & JPA CRUD

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Time spent: 8 hours

Screenshots:

### EXERCISE 5: ADVANCED SEARCH

The screenshot shows a web-based application interface for managing products. At the top, there is a search bar with fields for 'Name' (containing 'i'), 'Category' (set to 'All Categories'), 'Price' (set to '1'), and 'Quantity' (set to '1299'). To the right of these fields is a blue button labeled 'Advanced Search'. Below the search bar is a dropdown menu labeled 'All Categories ▾'. The main content area displays a table of products. The table has a header row with columns: ID, Code, Name, Price, Quantity, Category, and Actions. The 'Actions' column contains two buttons each: a green button with a pencil icon and a red button with a trash bin icon. The table lists the following products:

ID	Code	Name	Price	Quantity	Category	Actions
2	P002	iPhone 15 Pro	\$999.99	25	Electronics	
3	P003	Office Chair	\$199.99	50	Furniture	
4	P004	Office Chair Ergonomic	\$199.99	50	Furniture	
8	P007	iphone 14	\$40.00	11	Electronics	
9	P008	iphone 14 pro	\$100.00	19	Electronics	
10	P009	iphone 13	\$30.00	4	Electronics	
11	P0010	iphone 13 pr	\$55.00	23	Electronics	
14	P0011	iphone 12 pro	\$45.00	12	Electronics	

Product Management

Name contains... All Categories ▾ 0 999999 Advanced Search

All Categories ▾

ID	Code	Name	Price	Quantity	Category	Actions	
1	P001	Laptop Dell XPS 13	\$1300.00	10	Electronics		
2	P002	iPhone 15 Pro	\$999.99	25	Electronics		
3	P003	Office Chair	\$199.99	50	Furniture		
4	P004	Office Chair Ergonomic	\$199.99	50	Furniture		
6	P006	RTX 5090	\$400.00	6	Other		
7	P005	RTX 4090	\$200.00	12	Other		
8	P007	iphone 14	\$40.00	11	Electronics		
9	P008	iphone 14 pro	\$100.00	19	Electronics		
10	P009	iphone 13	\$30.00	4	Electronics		
11	P0010	iphone 13 pr	\$55.00	23	Electronics		

1 2

Product Management

View Dashboard Add Product  Search...

Name contains... All Categories ▾ 0 999999 Advanced Search

All Categories ▾

ID	Code	Name	Price	Quantity	Category	Actions	
14	P0011	iphone 12 pro	\$45.00	12	Electronics		
20	P0014	BookA	\$32.00	12	Books		
21	P0015	foodA	\$32.00	12	Food		

## EXERCISE 6: VALIDATION

## Add New Product

Product Code \*

Enter product code (e.g., P001)

Product code must be 3-20 characters

Product code must start with P followed by numbers

Product code is required

Product Name \*

FoodB

Price (\$) \*

12

Quantity \*

433

Category \*

Food

Description

Enter product description (optional)

 Save Product

 Cancel

## Add New Product

Product Code \*

P0017

Product Name \*

Enter product name

Name must be 3-100 characters

Product name is required

Price (\$) \*

12

Quantity \*

433

Category \*

Food

Description

Enter product description (optional)

 Save Product

 Cancel

### + Add New Product

Product Code \*  
P0017

Product Name \*  
FoodB

Price (\$) \*  
0.00  
Price is required

Quantity \*  
433

Category \*  
Food

Description  
Enter product description (optional)

Save Product Cancel

### + Add New Product

Product Code \*  
P0017

Product Name \*  
FoodB

Price (\$) \*  
12

Quantity \*  
0  
Quantity is required

Category \*  
Food

Description  
Enter product description (optional)

Save Product Cancel

### + Add New Product

Product Code \*

Product Name \*

Price (\$) \*

Quantity \*

Category \*

Select category

Category is required

Description

Enter product description (optional)

Save Product Cancel

## EXERCISE 7: SORTING & FILTERING

### Product Management

View Dashboard Add Product Search... Logout

Name contains...  Food  Max Price

ID	Code	Name	Price	Quantity	Category	Actions
21	P0015	foodA	\$32.00	12	Food	<span style="background-color: green; color: white; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 10px;"></span> <span style="background-color: red; color: white; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">X</span>
24	P0017	FoodB	\$12.00	433	Food	<span style="background-color: green; color: white; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 10px;"></span> <span style="background-color: red; color: white; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">X</span>

### Product Management

[View Dashboard](#) [Add Product](#)

Name contains...  Electronics   [Advanced Search](#)

Electronics

ID	Code	Name	Price	Quantity	Category	Actions
1	P001	Laptop Dell XPS 13	\$1300.00	10	Electronics	
2	P002	iPhone 15 Pro	\$999.99	25	Electronics	
8	P007	iphone 14	\$40.00	11	Electronics	
9	P008	iphone 14 pro	\$100.00	19	Electronics	
10	P009	iphone 13	\$30.00	4	Electronics	
11	P0010	iphone 13 pr	\$55.00	23	Electronics	
14	P0011	iphone 12 pro	\$45.00	12	Electronics	

## EXERCISE 8: STATISTICS DASHBOARD

### Product Statistics Dashboard

[Back to Products](#)

Total Products **14**

Total Inventory Value **\$73027.75**

Average Price **\$260.43**

**Products by Category**

Category	Count
Books	1
Electronics	7
Food	2
Furniture	2
Other	2

**Low Stock Products (quantity < 10)**

Code	Name	Quantity	Category
P006	RTX 5090	6 <span style="background-color: yellow;">Low</span>	Other
P009	iphone 13	4 <span style="background-color: yellow;">Low</span>	Electronics

Category	Count
Books	1
Electronics	7
Food	2
Furniture	2
Other	2

  

Low Stock Products (quantity < 10)			
Code	Name	Quantity	Category
P006	RTX 5090	6   Low	Other
P009	iphone 13	4   Low	Electronics

  

Recent Products (last 5)			
Code	Name	Category	Created At
P0017	FoodB	Food	2025-12-05 17:12
P0015	foodA	Food	2025-12-04 02:17
P0014	BookA	Books	2025-12-04 02:17
P0011	iphone 12 pro	Electronics	2025-12-03 01:03
P0010	iphone 13 pr	Electronics	2025-12-03 00:49

Report:

Ex5:

Advanced Search Workflow:

- User fills filters (name, category, minPrice, maxPrice).
- Controller routes to productService.advancedSearch().
- Repository runs JPQL with dynamic conditions.
- Returns Page with filtered results.
- View renders advanced search results with pagination.

Ex6:

1. User submits product form to /products/save.
2. Controller receives @Valid Product + BindingResult.
3. If validation fails (result.hasErrors()):

- a. Controller returns product-form.html.
  - b. Invalid fields show red border and error messages.
4. If validation passes:
- a. Service saves product to DB.
  - b. Redirects to /products with success message

Ex7:

1. Sorting Workflow
  - a. User clicks sortable column →  
`/products?sortBy=price&sortDir=asc.`
  - b. Controller builds Sort sort =  
`Sort.by("price").ascending().`
  - c. Calls productService.getAllProducts(sort).
  - d. Repository executes ORDER BY query.
  - e. Sorted results returned and displayed.
2. Category Filter Workflow
  - a. User selects category filter →  
`/products?category=Furniture.`
  - b. Controller calls getProductsByCategory("Furniture").
  - c. View displays filtered list.
3. Combined Sorting + Filtering Workflow
  - a. URL example:  
`/products?category=Electronics&sortBy=name&sortDir=desc.` • Controller builds Sort object and calls  
`getProductsByCategory(category, sort).`
  - b. Repository runs SELECT \* WHERE  
`category='Electronics'` ORDER BY name DESC.

Ex8:

1. User visits /dashboard.
2. DashboardController collects statistics via ProductService:
  - a. countByCategory(category)
  - b. calculateTotalValue()
  - c. calculateAveragePrice()