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| --- |
| Exercise 2: E-commerce Platform Search Function |

import java.util.Arrays;

import java.util.Comparator;

class Product {

    int productId;

    String productName;

    String category;

    public Product(int id, String name, String category) {

        this.productId = id;

        this.productName = name;

        this.category = category;

    }

    @Override

    public String toString() {

        return "[" + productId + "] " + productName + " (" + category + ")";

    }

}

public class Main {

    public static Product linearSearch(Product[] products, String targetName) {

        for (Product product : products) {

            if (product.productName.equalsIgnoreCase(targetName)) {

                return product;

            }

        }

        return null;

    }

    public static Product binarySearch(Product[] products, String targetName) {

        int left = 0, right = products.length - 1;

        while (left <= right) {

            int mid = left + (right - left) / 2;

            int cmp = targetName.compareToIgnoreCase(products[mid].productName);

            if (cmp == 0) {

                return products[mid];

            } else if (cmp < 0) {

                right = mid - 1;

            } else {

                left = mid + 1;

            }

        }

        return null;

    }

    public static void main(String[] args) {

        Product[] products = {

            new Product(1, "Laptop", "Electronics"),

            new Product(2, "Shoes", "Footwear"),

            new Product(3, "Book", "Education"),

            new Product(4, "Phone", "Electronics"),

            new Product(5, "Bag", "Accessories")

        };

        System.out.println("Linear Search Result:");

        Product result1 = linearSearch(products, "Phone");

        System.out.println(result1 != null ? result1 : "Product not found.");

        Arrays.sort(products, Comparator.comparing(p -> p.productName.toLowerCase()));

        System.out.println("\nBinary Search Result:");

        Product result2 = binarySearch(products, "Phone");

        System.out.println(result2 != null ? result2 : "Product not found.");

    }

}

**OUTPUT:**

[Running] cd "c:\Users\rishi\" && javac Main.java && java Main

Linear Search Result:

[4] Phone (Electronics)

Binary Search Result:

[4] Phone (Electronics)

[Done] exited with code=0 in 2.704 seconds