( ECommerceSearch.java )

import java.util.\*;

class Product {

int productId;

String productName;

String category;

public Product(int productId, String productName, String category) {

this.productId = productId;

this.productName = productName;

this.category = category;

}

@Override

public String toString() {

return "Product ID: " + productId + ", Name: " + productName + ", Category: " + category;

}

}

public class ECommerceSearch {

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

for (Product p : products) {

if (p.productName.equalsIgnoreCase(name)) {

return p;

}

}

return null;

}

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

int low = 0;

int high = products.length - 1;

while (low <= high) {

int mid = (low + high) / 2;

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

if (cmp == 0) {

return products[mid];

} else if (cmp < 0) {

high = mid - 1;

} else {

low = mid + 1;

}

}

return null;

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

Product[] products = {

new Product(101, "Mobile", "Electronics"),

new Product(102, "Shoes", "Footwear"),

new Product(103, "Laptop", "Electronics"),

new Product(104, "T-Shirt", "Clothing"),

new Product(105, "Washing Machine", "Home Appliances")

};

System.out.println("E-Commerce Product Search ");

System.out.print("Enter the product name to search: ");

String searchName = sc.nextLine();

System.out.println("\n Linear Search Result ");

Product linearResult = linearSearch(products, searchName);

if (linearResult != null) {

System.out.println("Product Found: " + linearResult);

} else {

System.out.println("Product not found.");

}

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

System.out.println("\n Binary Search Result ");

Product binaryResult = binarySearch(products, searchName);

if (binaryResult != null) {

System.out.println("Product Found: " + binaryResult);

} else {

System.out.println("Product not found.");

}

sc.close();

}

}

