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

**CODE: JAVA CODE(LINEAR AND BINARY SEARCH)**

import java.util.Arrays;

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;

}

public String toString() {

return productId + " | " + productName + " | " + category;

}

}

public class ECommerceSearch {

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

for (int i = 0; i < products.length; i++) {

if (products[i].productName.equalsIgnoreCase(targetName)) {

return i;

}

}

return -1;

}

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

int low = 0, high = products.length - 1;

while (low <= high) {

int mid = (low + high) / 2;

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

if (cmp == 0) return mid;

else if (cmp < 0) low = mid + 1;

else high = mid - 1;

}

return -1;

}

public static void main(String[] args) {

Product[] products = {

new Product(201, "Shoes", "Footwear"),

new Product(202, "T-Shirt", "Apparel"),

new Product(203, "Watch", "Accessories"),

new Product(204, "Laptop", "Electronics"),

new Product(205, "Bag", "Luggage")

};

// Linear Search

String target1 = "Laptop";

int index1 = linearSearch(products, target1);

System.out.println("Linear Search for '" + target1 + "':");

if (index1 != -1) System.out.println("Found: " + products[index1]);

else System.out.println("Not Found!");

// Binary Search requires sorted data

Arrays.sort(products, (a, b) -> a.productName.compareToIgnoreCase(b.productName));

String target2 = "Watch";

int index2 = binarySearch(products, target2);

System.out.println("\nBinary Search for '" + target2 + "':");

if (index2 != -1) System.out.println("Found: " + products[index2]);

else System.out.println("Not Found!");

}

}

OUTPUT:

Linear Search for 'Laptop':

Found: 204 | Laptop | Electronics

Binary Search for 'Watch':

Found: 203 | Watch | Accessories

