import java.util.Arrays;

class Product {

int productId;

String productName;

String category;

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

this.productId = productId;

this.productName = productName;

this.category = category;

}

@Override

public String toString() {

return productId + " - " + productName + " - " + category;

}

}

public class SearchFunctionality {

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

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

if (products[i].productName.equals(productName)) {

return i;

}

}

return -1;

}

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

Arrays.sort(products, (p1, p2) -> p1.productName.compareTo(p2.productName));

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

while (left <= right) {

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

int comparison = products[mid].productName.compareTo(productName);

if (comparison == 0) {

return mid;

} else if (comparison < 0) {

left = mid + 1;

} else {

right = mid - 1;

}

}

return -1;

}

public static void main(String[] args) {

Product[] products = {

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

new Product(2, "Mouse", "Electronics"),

new Product(3, "Keyboard", "Electronics")

};

int linearResult = linearSearch(products, "Mouse");

System.out.println("Linear Search Result: " + (linearResult != -1 ? products[linearResult] : "Not Found"));

int binaryResult = binarySearch(products, "Keyboard");

System.out.println("Binary Search Result: " + (binaryResult != -1 ? products[binaryResult] : "Not Found"));

}

}

OUTPUT:

