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

Code  
  
public class Product {

String name;

String category;

double price;

public Product(String name, String category, double price) {

this.name = name;

this.category = category;

this.price = price;

}

public void display() {

System.out.println(name + " | " + category + " | $" + price);

}

public String getName() {

return name;

}

public double getPrice() {

return price;

}

@Override

public String toString() {

return name + " | " + category + " | $" + price;

}

}

LinearSearch.java

import java.util.List;;

public class LinearSearch {

public static Product searchByName(List<Product> products, String targetName) {

for (Product p : products) {

if (p.getName().equalsIgnoreCase(targetName)) {

return p;

}

}

return null;

}

}

BinarySearch.java  
  
import java.util.Arrays;

import java.util.Comparator;

public class BinarySearch {

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

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

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

while (left <= right) {

int mid = (left + right) / 2;

int compare = products[mid].name.compareToIgnoreCase(targetName);

if (compare == 0)

return products[mid];

if (compare < 0)

left = mid + 1;

else

right = mid - 1;

}

return null;

}

}

Main.java

import java.util.Arrays;

import java.util.List;

public class Main {

public static void main(String[] args) {

Product[] products = {

new Product("Laptop", "Electronics", 1200.00),

new Product("Phone", "Electronics", 800.00),

new Product("Shoes", "Apparel", 150.00),

new Product("Watch", "Accessories", 250.00)

};

List<Product> productsList = Arrays.asList(products);

// Linear Search

Product foundLinear = LinearSearch.searchByName(productsList, "Phone");

System.out.println("Linear Search Result: " + (foundLinear != null ? foundLinear : "Not Found"));

System.out.println("---------------------------------------------");

Product result = BinarySearch.search(products, "Shoes");

if (result != null) {

System.out.println("Product found:");

result.display();

} else {

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

}

}

}

output:  
  
