**MODULE-2**

**DATA STRUCTURE AND ALGORITHM**

SUPERSET ID:6407550

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

**Product.java**

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 productId + " - " + productName + " (" + category + ")";

    }

}

**SearchOperations.java**

public class SearchOperations {

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

            if (cmp == 0) return products[mid];

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

            else right = mid - 1;

        }

        return null;

    }

}

**Main.java**

import java.util.\*;

public class Main {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        Product[] products = {

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

            new Product(102, "Shirt", "Clothing"),

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

            new Product(104, "Shoes", "Footwear"),

            new Product(105, "Watch", "Accessories")

        };

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

        String searchName = sc.nextLine();

        Product resultLinear = SearchOperations.linearSearch(products, searchName);

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

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

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

        Product resultBinary = SearchOperations.binarySearch(products, searchName);

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

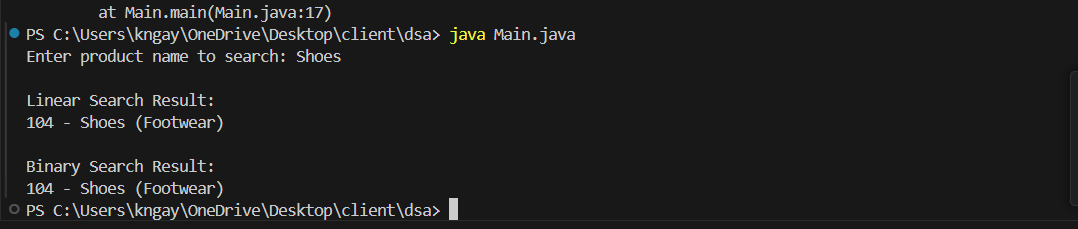
        System.out.println(resultBinary != null ? resultBinary : "Product not found");

        sc.close();

    }

}

**OUTPUT:**

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