**Main.java**  
  
package week1.e\_commerce;

public class Main {

    public static void main(String[] args) {

        Product[] products = {

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

            new Product(102, "Shampoo", "Beauty"),

            new Product(103, "Book", "Education"),

            new Product(104, "Mobile", "Electronics"),

            new Product(105, "Chair", "Furniture")

        };

        // Linear Search

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

        Product foundLinear = SearchUtility.linearSearch(products, "Mobile");

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

        // Binary Search (requires sorted array)

        SearchUtility.sortByProductName(products);

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

        Product foundBinary = SearchUtility.binarySearch(products, "Mobile");

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

    }

}

**Product.java**

package week1.e\_commerce;

public 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 + "]";

    }

}

**SearchUtility.java**

package week1.e\_commerce;

import java.util.Arrays;

import java.util.Comparator;

public class SearchUtility {

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

        for (Product product : products) {

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

                return product;

            }

        }

        return null;

    }

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

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

        while (low <= high) {

            int mid = (low + high) / 2;

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

            if (compare == 0)

                return products[mid];

            else if (compare < 0)

                low = mid + 1;

            else

                high = mid - 1;

        }

        return null;

    }

    public static void sortByProductName(Product[] products) {

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

    }

}