Exercise 2: E-commerce Platform Search Function

Product.java:

```
package ecommercePlatformSearchFunction;
public class Product {
        int id;
   String name;
   String category;
   public Product(int id, String name, String category) {
        this.id = id;
      this.name = name;
      this.category = category;
   }
   public String toString() {
        return id + " - " + name + " (" + category + ")";
   }
}
```

SearchImplementation.java :

```
package ecommercePlatformSearchFunction;
import java.util.Arrays;
import java.util.Comparator;
public class SearchImplementation {
            public static Product linearSearch(Product[] products, String name) {
               for (Product p : products) {
                  if (p.name.equalsIgnoreCase(name)) {
                     return p;
                  }
               }
               return null;
```

```
}
public static Product binarySearch(Product[] products, String name) {
    int left = 0;
    int right = products.length - 1;

    while (left <= right) {
        int mid = (left + right) / 2;
        int compare = name.compareToIgnoreCase(products[mid].name);

        if (compare == 0) {
            return products[mid];
        } else if (compare < 0) {
            right = mid - 1;
        } else {
            left = mid + 1;
        }
    }
    return null;
}
public static void main(String[] args) {
    Product[] products = {
        new Product(1, "Laptop", "Electronics"),
        new Product(2, "Shoes", "Footwear"),
        new Product(3, "Watch", "Accessories"),
        new Product(4, "Shirt", "Clothing")
    };
    System.out.println("Linear Search:");
    Product found1 = linearSearch(products, "Shirt");
    System.out.println(found1 != null ? found1 : "Product not found");
```

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

        System.out.println("Binary Search:");

        Product found2 = binarySearch(products, "Watch");

        System.out.println(found2 != null ? found2 : "Product not found");

    }

}
```

Output:

```
1  package ecommercePlatformSearchFunction;
2  import java.util.Arrays;
3  import java.util.Comparator;
4  public class SearchImplementation {
5          public static Product linearSearch(Product[] products, String name) {
6              for (Product p : products) {
7                  if (p.name.equalsIgnoreCase(name)) {
8                      return p;
9                  }
10             }
11             return null;
12         }
13
14         public static Product binarySearch(Product[] products, String name) {
15             int left = 0;
16             int right = products.length - 1;
17
18             while (left <= right) {
19                 int mid = (left + right) / 2;
20                 int compare = name.compareToIgnoreCase(products[mid].name);
21
22                 if (compare == 0) {
23                     return products[mid];
24                 } else if (compare < 0) {
25                     right = mid - 1;
26                 } else {
27                     left = mid + 1;
28                 }
29             }
30
```

Console Coverage

<terminated> SearchImplementation [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (22-Jun-2025, 3:06:29 pm – 3:06:

```
Linear Search:
4 - Shirt (Clothing)
Binary Search:
3 - Watch (Accessories)
```