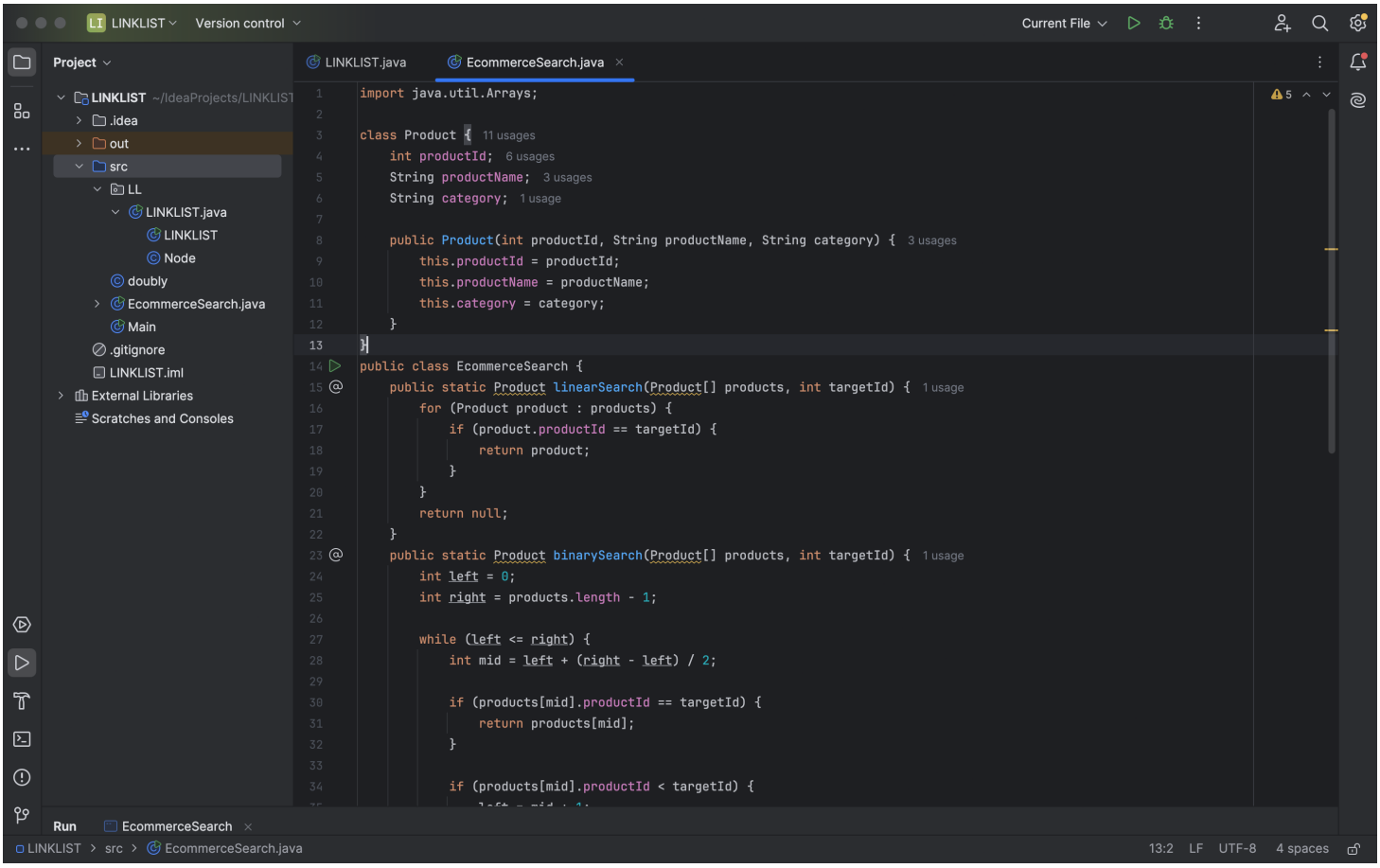
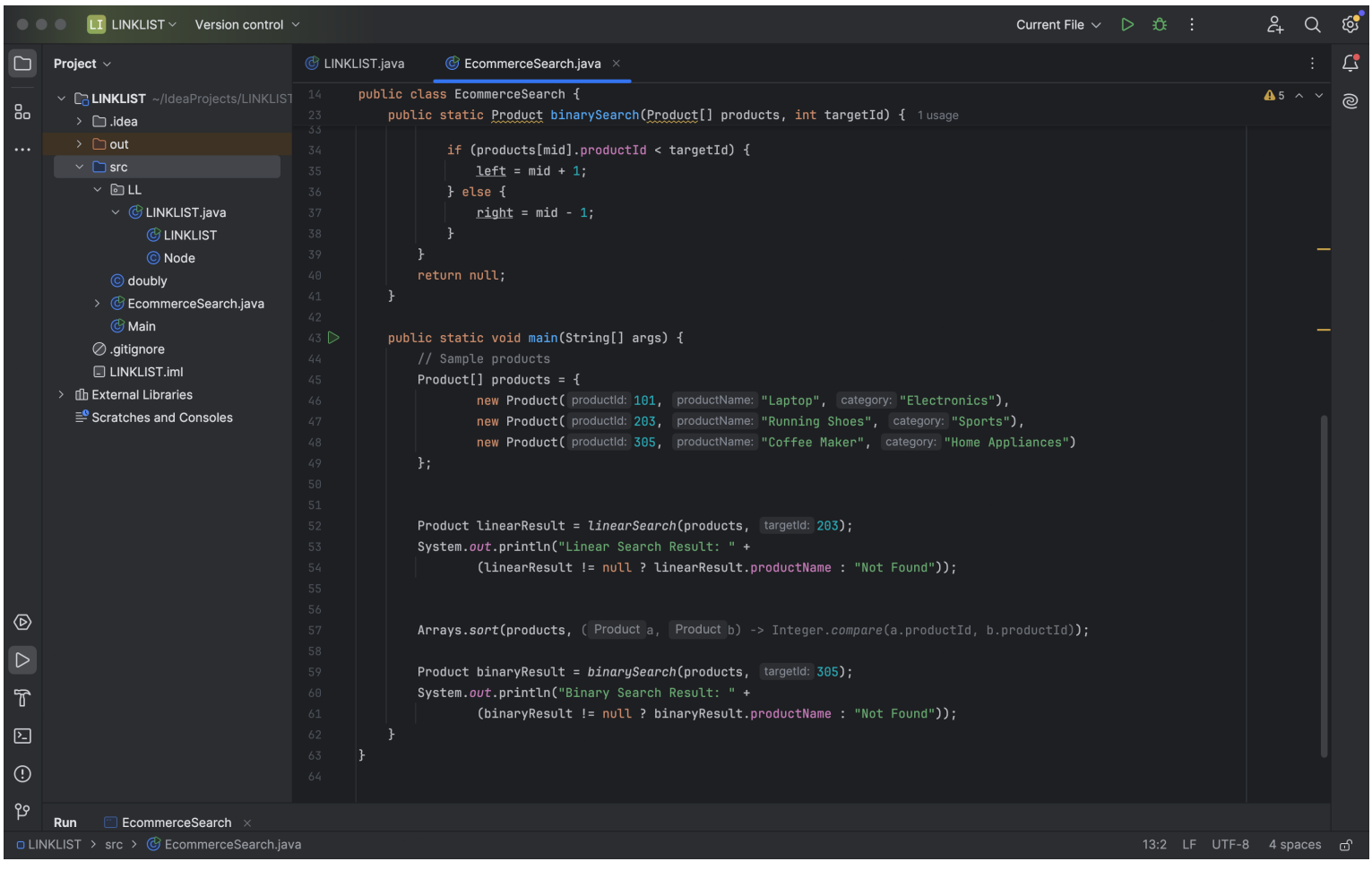
PROBLEM 2 -> DSA. ECOMMERCE.SEARCH WITH LINEARSEARCH AND BINARYSEARCH

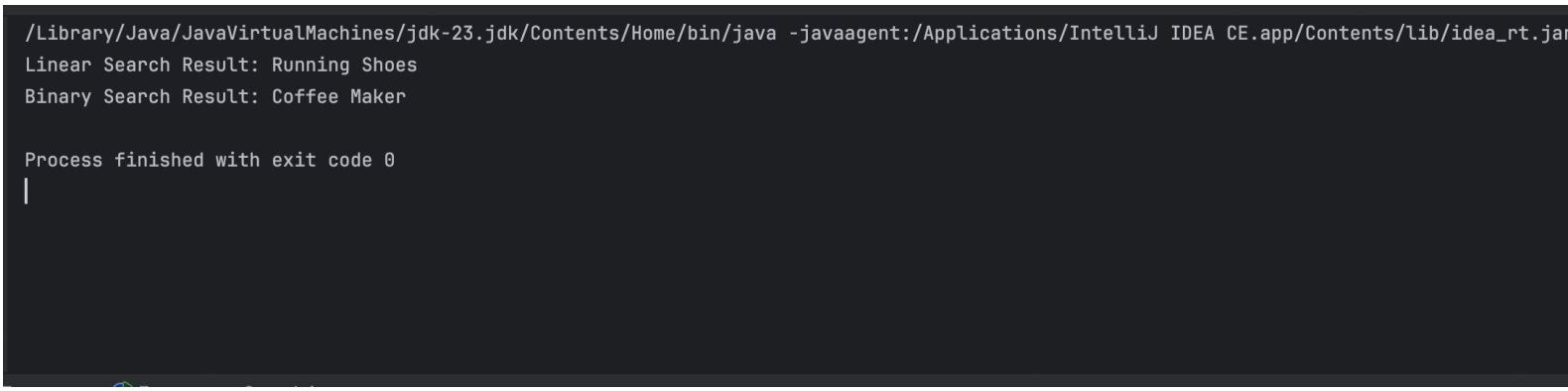


```
import java.util.Arrays;

class Product {  11 usages
    int productId;  6 usages
    String productName;  3 usages
    String category;  1 usage

    public Product(int productId, String productName, String category) {  3 usages
        this.productId = productId;
        this.productName = productName;
        this.category = category;
    }
}
public class EcommerceSearch {
    public static Product linearSearch(Product[] products, int targetId) {  1 usage
        for (Product product : products) {
            if (product.productId == targetId) {
                return product;
            }
        }
        return null;
    }
    public static Product binarySearch(Product[] products, int targetId) {  1 usage
        int left = 0;
        int right = products.length - 1;

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

            if (products[mid].productId == targetId) {
                return products[mid];
            }

            if (products[mid].productId < targetId) {
```



```
public class EcommerceSearch {
    public static Product binarySearch(Product[] products, int targetId) {  1 usage

            if (products[mid].productId < targetId) {
                left = mid + 1;
            } else {
                right = mid - 1;
            }
        }
        return null;
    }

    public static void main(String[] args) {
        // Sample products
        Product[] products = {
                new Product( productId: 101,  productName: "Laptop",  category: "Electronics"),
                new Product( productId: 203,  productName: "Running Shoes",  category: "Sports"),
                new Product( productId: 305,  productName: "Coffee Maker",  category: "Home Appliances")
        };


        Product linearResult = linearSearch(products,  targetId: 203);
        System.out.println("Linear Search Result: " +
                (linearResult != null ? linearResult.productName : "Not Found"));


        Arrays.sort(products, ( Product a,  Product b) -> Integer.compare(a.productId, b.productId));

        Product binaryResult = binarySearch(products,  targetId: 305);
        System.out.println("Binary Search Result: " +
                (binaryResult != null ? binaryResult.productName : "Not Found"));
    }
}
```

OUTPUT -->>


/Library/Java/JavaVirtualMachines/jdk-23.jdk/Contents/Home/bin/java -javaagent:/Applications/IntelliJ IDEA CE.app/Contents/lib/idea_rt.jar
Linear Search Result: Running Shoes
Binary Search Result: Coffee Maker
Process finished with exit code 0