

Exercise 2: E-commerce Platform Search Function

```
import java.util.Arrays;

class Product {
    int productId;
    String productName;
    String category;

    Product(int id, String name,
String cat) {
        this.productId = id;
        this.productName = name;
        this.category = cat;
    }

    void display() {
        System.out.println(productId + "
- " + productName + " (" +
category + ")");
    }
}

public class Main {
    // Linear Search

    public static Product
linearSearch(Product[] products,
int id) {
        for (Product p : products) {
            if (p.productId == id) {
                return p;
            }
        }
        return null;
    }

    // Binary Search (Assumes
sorted array by productId)

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

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

            if
(products[mid].productId == id)
return products[mid];

            if
(products[mid].productId < id)
left = mid + 1;

            else right = mid - 1;
        }

        return null;
    }

    public static void
main(String[] args) {
        Product[] products = {
            new Product(103,
"Keyboard", "Electronics"),

            new Product(101,
"Shoes", "Apparel"),

            new Product(104,
"Book", "Stationery"),

            new Product(102,
"Phone", "Electronics")
        };

        // For Binary Search: sort
by productId

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

        // Test Linear Search

        Product found1 =
linearSearch(products, 104);

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

        if (found1 != null)
found1.display(); else
System.out.println("Not
Found");

        // Test Binary Search

        Product found2 =
binarySearch(products, 102);

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

        if (found2 != null)
found2.display(); else
System.out.println("Not
Found");
    }
}
```

Using JDoodle compiler



The screenshot shows the output of a Java program compiled and executed in 2.519 seconds. The output is displayed in a dark-themed window with two tabs: 'Output' and 'Generated files'. The 'Output' tab is active, showing the following text:

```
Linear Search:
104 - Book (Stationery)

Binary Search:
102 - Phone (Electronics)
```