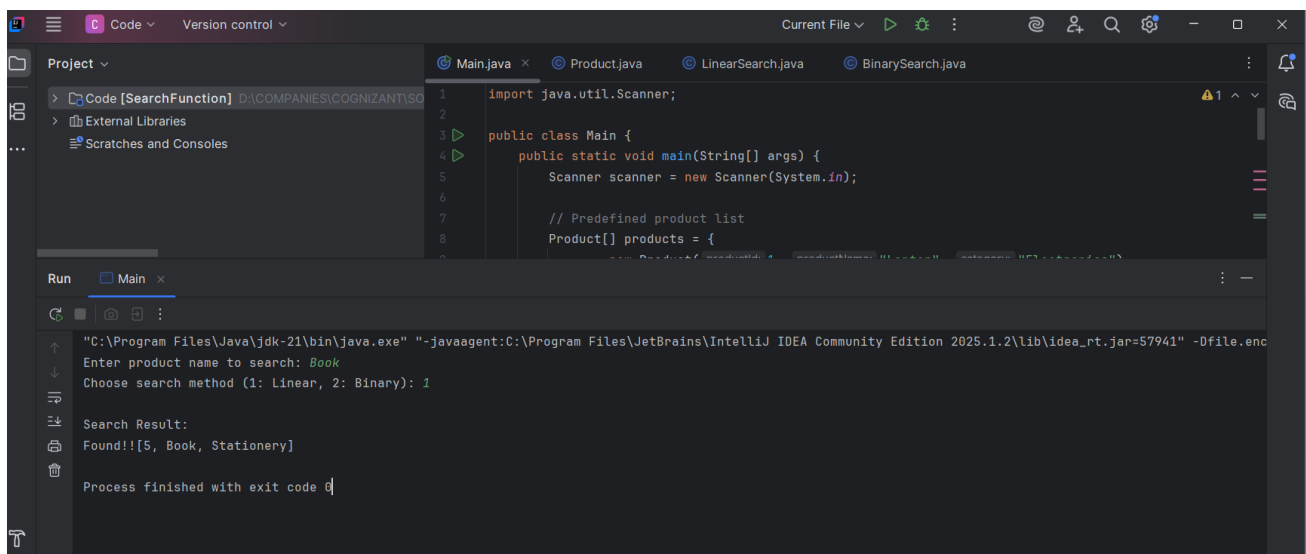


## ❖ Exercise 2: E-commerce Platform Search Function

Output :

➔ Using Linear Search :



The screenshot shows the IntelliJ IDEA IDE with a project named 'Code [SearchFunction]'. The 'Main.java' file is open, displaying the following code:

```
1 import java.util.Scanner;
2
3 public class Main {
4     public static void main(String[] args) {
5         Scanner scanner = new Scanner(System.in);
6
7         // Predefined product list
8         Product[] products = {
9             new Product(1, "Laptop", "Electronics"),
10            new Product(2, "Mouse", "Electronics"),
11            new Product(3, "Shoes", "Footwear"),
12            new Product(4, "Watch", "Accessories"),
13            new Product(5, "Book", "Stationery")
14        };
15    }
16 }
```

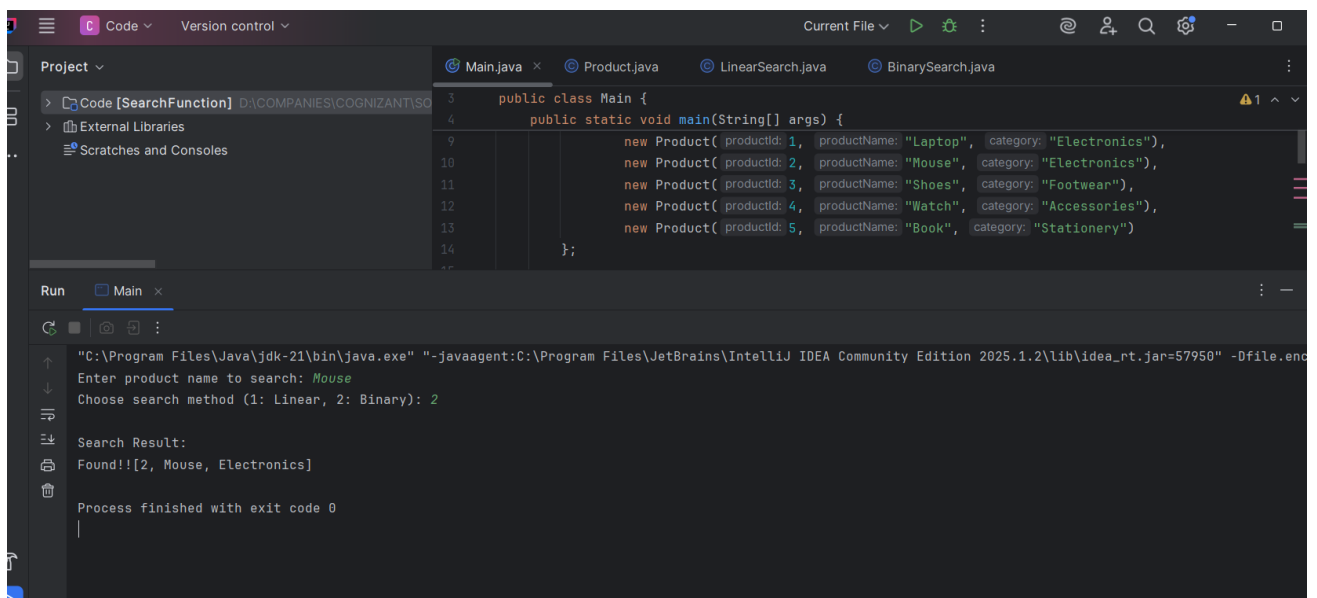
The 'Run' console shows the execution of the program:

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2025.1.2\lib\idea_rt.jar=57941" -Dfile.encoding=UTF-8
Enter product name to search: Book
Choose search method (1: Linear, 2: Binary): 1

Search Result:
Found!![5, Book, Stationery]

Process finished with exit code 0
```

➔ Using Binary Search :



The screenshot shows the IntelliJ IDEA IDE with the same project. The 'Main.java' file is open, displaying the following code:

```
3 public class Main {
4     public static void main(String[] args) {
5
6         // Predefined product list
7         Product[] products = {
8             new Product(1, "Laptop", "Electronics"),
9             new Product(2, "Mouse", "Electronics"),
10            new Product(3, "Shoes", "Footwear"),
11            new Product(4, "Watch", "Accessories"),
12            new Product(5, "Book", "Stationery")
13        };
14    }
15 }
```

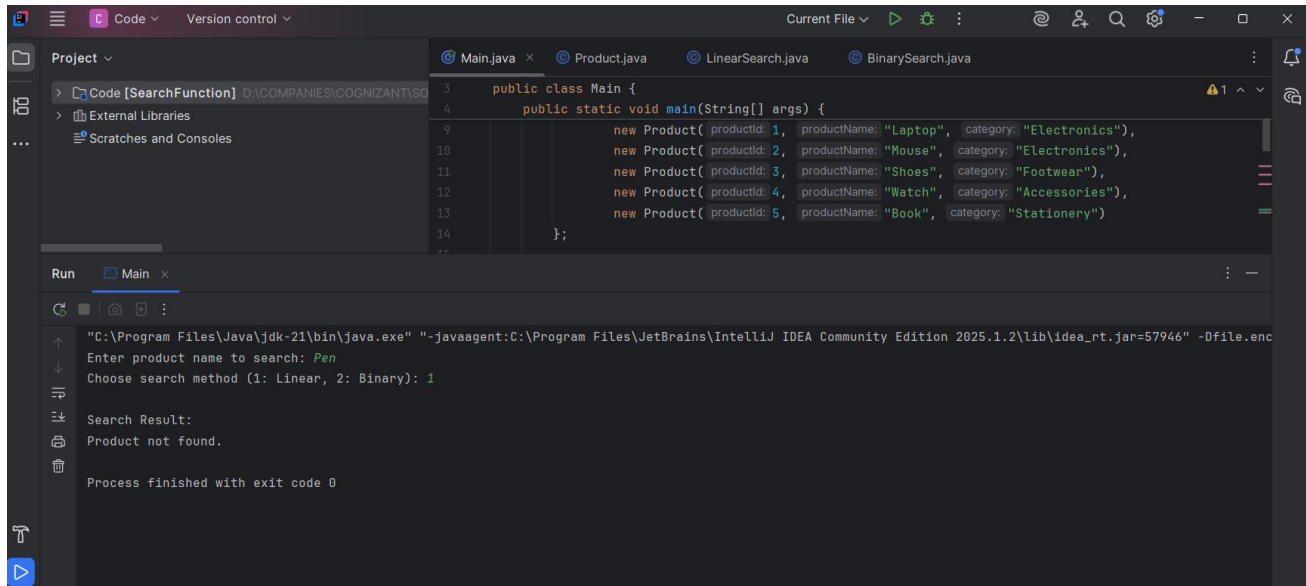
The 'Run' console shows the execution of the program:

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2025.1.2\lib\idea_rt.jar=57950" -Dfile.encoding=UTF-8
Enter product name to search: Mouse
Choose search method (1: Linear, 2: Binary): 2

Search Result:
Found!![2, Mouse, Electronics]

Process finished with exit code 0
```

→ If Product is not Available:



```
public class Main {  
    public static void main(String[] args) {  
        new Product( productid: 1, productName: "Laptop", category: "Electronics"),  
        new Product( productid: 2, productName: "Mouse", category: "Electronics"),  
        new Product( productid: 3, productName: "Shoes", category: "Footwear"),  
        new Product( productid: 4, productName: "Watch", category: "Accessories"),  
        new Product( productid: 5, productName: "Book", category: "Stationery")  
    }  
};
```

Run Main x

"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2025.1.2\lib\idea\_rt.jar=57946" -Dfile.encoding=UTF-8

Enter product name to search: Pen

Choose search method (1: Linear, 2: Binary): 1

Search Result:

Product not found.

Process finished with exit code 0

→ Comparing Linear Search and Binary Search :

Feature	Linear Search	Binary Search
Data Requirement	Works on unsorted or sorted data	Requires sorted data
Time Complexity (Best)	O(1)	O(1)
Time Complexity (Average)	O(n)	O(log n)
Time Complexity (Worst)	O(n)	O(log n)
Space Complexity	O(1)	O(1) (iterative), O(log n) (recursive)
Method Type	Sequential	Divide and conquer
Suitable For	Small or unsorted datasets	Large and sorted datasets
Implementation Ease	Very simple	Moderate complexity