

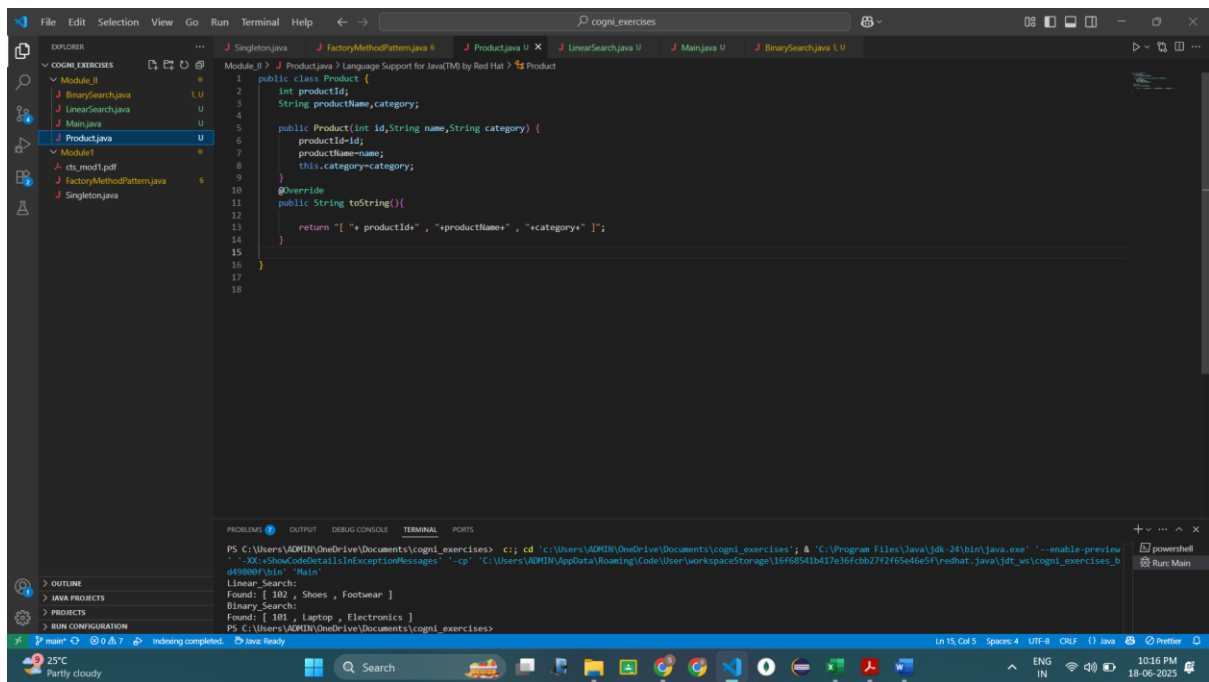
HANDS-ON-EXERCISE

MODULE II- Data Structures and Algorithms

CODE:

EXERCISE - E-commerce Platform Search Function

CLASS-> PRODUCT

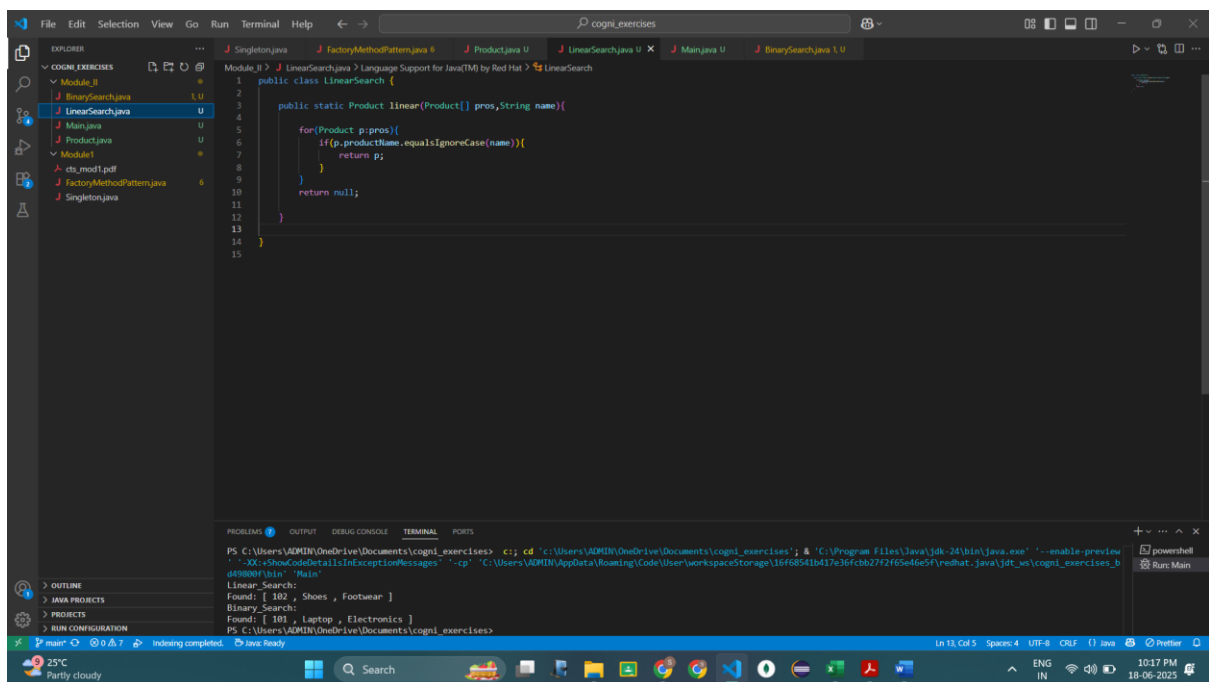


```
1 public class Product {
2     int productId;
3     String productName, category;
4
5     public Product(int id,String name,String category) {
6         productId=id;
7         productName=name;
8         this.category=category;
9     }
10
11     @Override
12     public String toString(){
13         return "[" + productId + ", " + productName + ", " + category + "]";
14     }
15 }
16
17
18
```

PS C:\Users\ADMIN\OneDrive\Documents\cogni_exercises> cd 'c:\Users\ADMIN\OneDrive\Documents\cogni_exercises'; & 'C:\Program Files\Java\jdk-24\bin\java.exe' '-enable-preview' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\ADMIN\AppData\Roaming\Code\User\workspaceStorage\16f68541b417e36fcb27f2f65e46e5f\redhat.java\jdt_vs\cogni_exercises_b' java Main

Linear Search:
Found: [102 , Shoes , Footwear]
Binary Search:
Found: [101 , Laptop , Electronics]

CLASS-> LINEAR_SEARCH

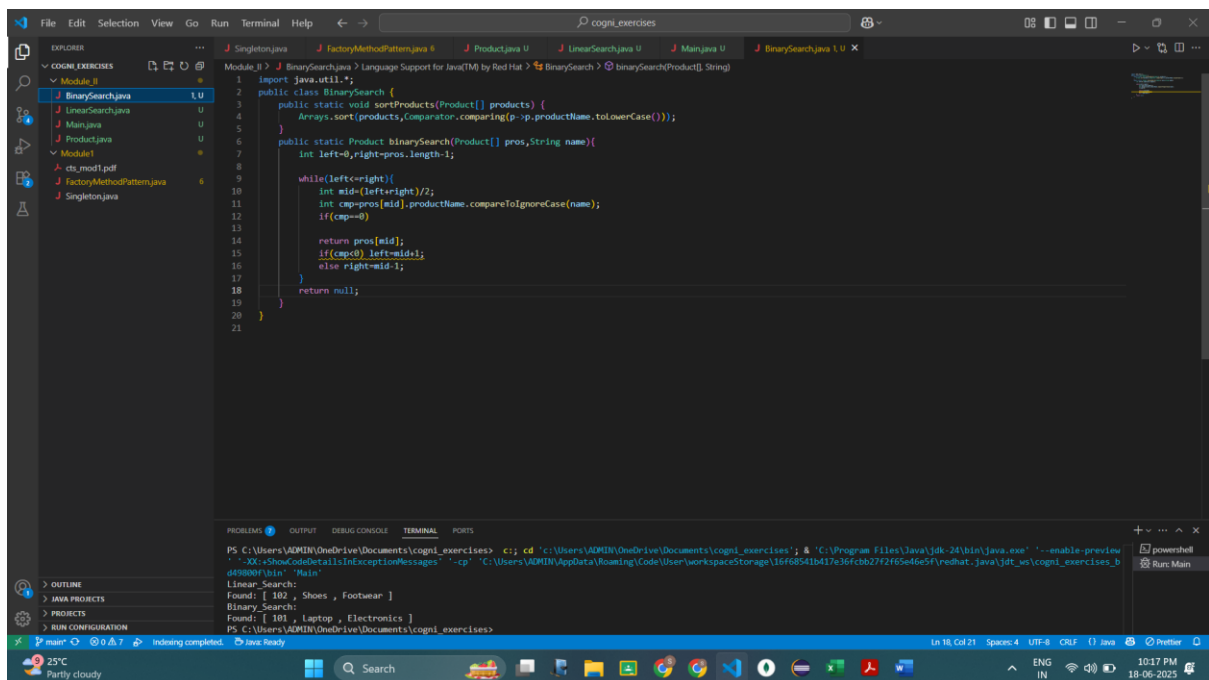


```
1 public class LinearSearch {
2
3     public static Product linear(Product[] pros,String name){
4
5         for(Product p:pros){
6             if(p.productName.equalsIgnoreCase(name)){
7                 return p;
8             }
9         }
10         return null;
11     }
12 }
13
14
15
```

PS C:\Users\ADMIN\OneDrive\Documents\cogni_exercises> cd 'c:\Users\ADMIN\OneDrive\Documents\cogni_exercises'; & 'C:\Program Files\Java\jdk-24\bin\java.exe' '-enable-preview' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\ADMIN\AppData\Roaming\Code\User\workspaceStorage\16f68541b417e36fcb27f2f65e46e5f\redhat.java\jdt_vs\cogni_exercises_b' java Main

Linear Search:
Found: [102 , Shoes , Footwear]
Binary Search:
Found: [101 , Laptop , Electronics]

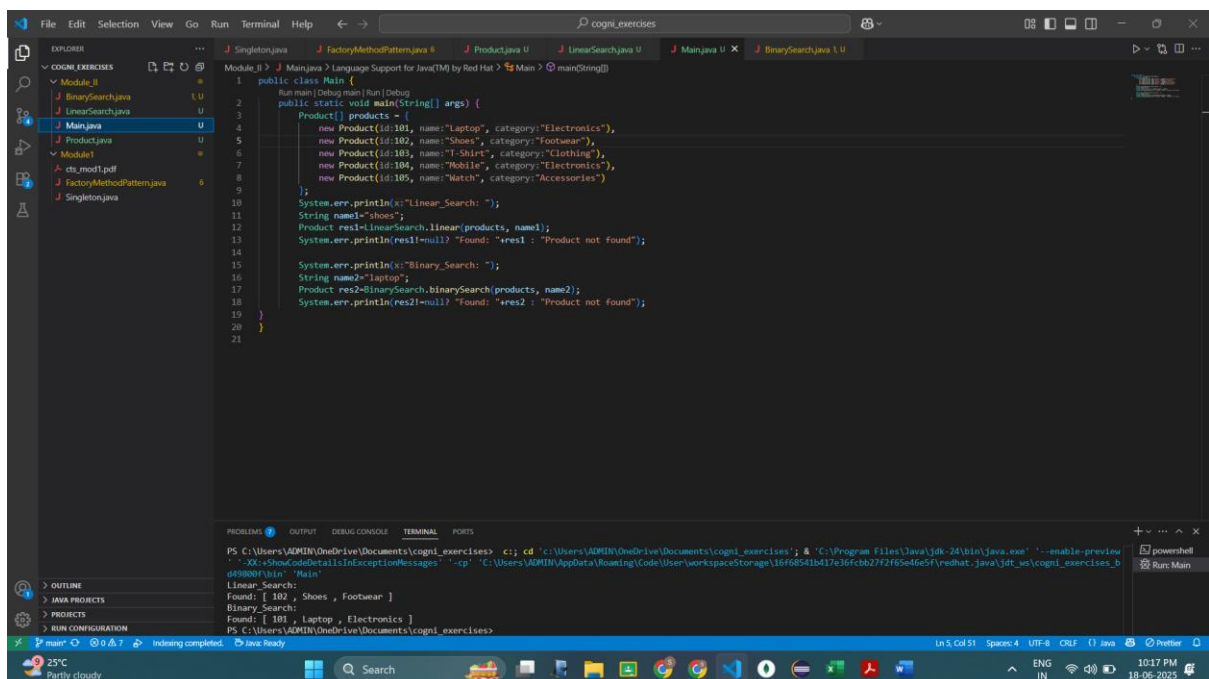
CLASS -> BINARY_SEARCH



```
Module 0 > J BinarySearch.java > Language Support for Java(TM) by Red Hat > BinarySearch > binarySearch(Product[] products, String name)
1 import java.util.*;
2 public class BinarySearch {
3     public static void sortProducts(Product[] products) {
4         Arrays.sort(products, Comparator.comparing(p -> p.productName.toLowerCase()));
5     }
6     public static Product binarySearch(Product[] pros, String name) {
7         int left = 0, right = pros.length - 1;
8
9         while (left <= right) {
10             int mid = (left + right) / 2;
11             int cmp = pros[mid].productName.compareToIgnoreCase(name);
12             if (cmp == 0)
13                 return pros[mid];
14             if (cmp < 0)
15                 left = mid + 1;
16             else
17                 right = mid - 1;
18         }
19         return null;
20     }
21 }
```

```
PS C:\Users\ADMIN\OneDrive\Documents\cognit_exercises> cd 'C:\Users\ADMIN\OneDrive\Documents\cognit_exercises'; & 'C:\Program Files\Java\jdk-24\bin\java.exe' --enable-preview -XX:+ShowCodeDetailsInExceptionMessages -cp 'C:\Users\ADMIN\AppData\Roaming\Code\User\workspaceStorage\16f68541b417e36fcb27f2f65e46c5f\redhat.java\jdt_ws\cognit_exercises_b\493800P\bin' Main
Linear_Search:
Found: [ 102 , Shoes , Footwear ]
Binary_Search:
Found: [ 101 , Laptop , Electronics ]
PS C:\Users\ADMIN\OneDrive\Documents\cognit_exercises>
```

CLASS -> MAIN & OUTPUT

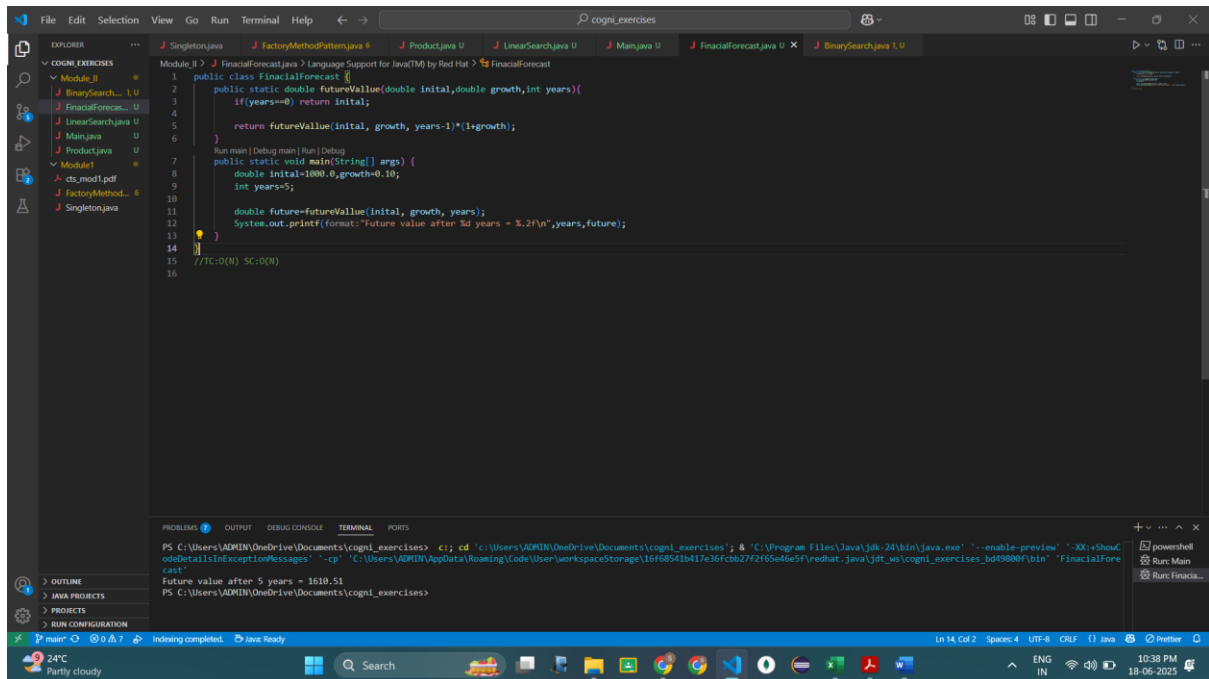


```
Module 0 > J Main.java > Language Support for Java(TM) by Red Hat > Main > main(String[] args) {
1 public class Main {
2     public static void main(String[] args) {
3         Product[] products = {
4             new Product(id:101, name:"Laptop", category:"Electronics"),
5             new Product(id:102, name:"Shoes", category:"Footwear"),
6             new Product(id:103, name:"T-Shirt", category:"Clothing"),
7             new Product(id:104, name:"Mobile", category:"Electronics"),
8             new Product(id:105, name:"Watch", category:"Accessories")
9         };
10        System.err.println("Linear_Search: ");
11        String name1="Shoes";
12        Product res1=linearSearch.linear(products, name1);
13        System.err.println(res1==null? "Found: "+res1 : "Product not found");
14
15        System.err.println("Binary_Search: ");
16        String name2="Laptop";
17        Product res2=BinarySearch.binarySearch(products, name2);
18        System.err.println(res2==null? "Found: "+res2 : "Product not found");
19    }
20 }
21 }
```

```
PS C:\Users\ADMIN\OneDrive\Documents\cognit_exercises> cd 'C:\Users\ADMIN\OneDrive\Documents\cognit_exercises'; & 'C:\Program Files\Java\jdk-24\bin\java.exe' --enable-preview -XX:+ShowCodeDetailsInExceptionMessages -cp 'C:\Users\ADMIN\AppData\Roaming\Code\User\workspaceStorage\16f68541b417e36fcb27f2f65e46c5f\redhat.java\jdt_ws\cognit_exercises_b\493800P\bin' Main
Linear_Search:
Found: [ 102 , Shoes , Footwear ]
Binary_Search:
Found: [ 101 , Laptop , Electronics ]
PS C:\Users\ADMIN\OneDrive\Documents\cognit_exercises>
```

EXERCISE - Financial Forecasting

CODE AND OUTPUT:



The screenshot shows an IDE with a Java project named 'cognit_exercises'. The main file, 'FinacialForecast.java', contains the following code:

```
1 public class FinacialForecast {
2     public static double futureValue(double initial, double growth, int years) {
3         if (years == 0) return initial;
4         return futureValue(initial, growth, years - 1) * (1 + growth);
5     }
6 }
7
8 public static void main(String[] args) {
9     double initial = 1000.0;
10    double growth = 0.10;
11    int years = 5;
12
13    double future = futureValue(initial, growth, years);
14    System.out.printf("Future value after %d years = %.2f\n", years, future);
15 }
16 // TC: O(N) SC: O(N)
```

The output console shows the result of running the program:

```
Future value after 5 years = 1610.51
```

The terminal window at the bottom shows the command used to run the program:

```
PS C:\Users\ADMIN\OneDrive\Documents\cognit_exercises> cd 'C:\Users\ADMIN\OneDrive\Documents\cognit_exercises'; & 'C:\Program Files\Java\jdk-24\bin\java.exe' '-enable-preview' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\ADMIN\AppData\Local\Code\User\workspaceStorage\16f68541b417e36fcb27f2f65e46e5f\redhat.java\jdk_ws\cognit_exercises_bd49800f\bin' 'FinacialForecast'
```