Data structures and Algorithms

**Exercise 2: E-commerce Platform Search Function**

**Product.java**

package com.ecommerce.example;

public class Product {

int productId;

String productName;

String category;

public Product(int productId,String productName,String category)

{

this.productId=productId;

this.productName=productName;

this.category=category;

}

public String toString()

{

return "ProductId: "+productId+" ProductName: "+productName+"Category: "+category;

}

}

**SearchFunction.java**

package com.ecommerce.example;

import java.util.Arrays;

import java.util.Comparator;

public class SearchFunction {

public static Product LinearSearch(Product pd[],String pname)

{

for(Product p:pd)

{

if(p.productName.equalsIgnoreCase(pname))

{

return p;

}

}

return null;

}

public static Product BinarySearch(Product pro[],String pname)

{

int start=0;

int end=pro.length-1;

while(start<=end)

{

int mid=start+end/2;

int compare=pname.compareTo(pro[mid].productName);

if(compare==0)

return pro[mid];

else if(compare<0)

end=mid-1;

else

start=mid+1;

}

return null;

}

public static void sort(Product p[])

{

Arrays.*sort*(p,Comparator.*comparing*(pr->pr.productName.toLowerCase()));

}

}

**Main.java**

package com.ecommerce.example;

public class Main {

public static void main(String args[])

{

Product[] products = {

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

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

new Product(103,"Tab","Electronics"),

new Product(104,"Watches","Fashion"),

};

Product result1 = SearchFunction.*LinearSearch*(products, "Phone");

System.*out*.println("Linear Search Result: " + (result1 != null ? result1 : "Product not found"));

SearchFunction.*sort*(products);

Product result2 = SearchFunction.*BinarySearch*(products, "Phone");

System.*out*.println("Binary Search Result: " + (result2 != null ? result2 : "Product not found"));

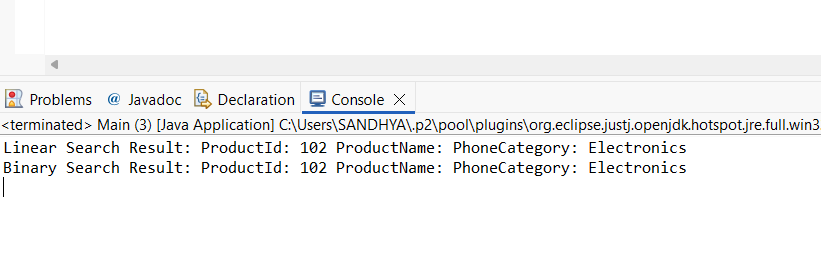
}

}

**OUTPUT**

Linear Search Result: ProductId: 102 ProductName: PhoneCategory: Electronics

Binary Search Result: ProductId: 102 ProductName: PhoneCategory: Electronics

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