**Week-1**

**Data Structures and Algorithm**

**Exercise1 – E-Commerce**

**To Compare Linear Search And Binary Search**

**Product.java**

public class Product {  
 String productId;  
 String productName;  
 String category;  
 public Product(String productId, String productName,String category){  
 this.productId=productId;  
 this.productName=productName;  
 this.category= category;  
 }  
 public String toString(){  
 return productId +" - " + productName + " -" + category;  
 }  
}

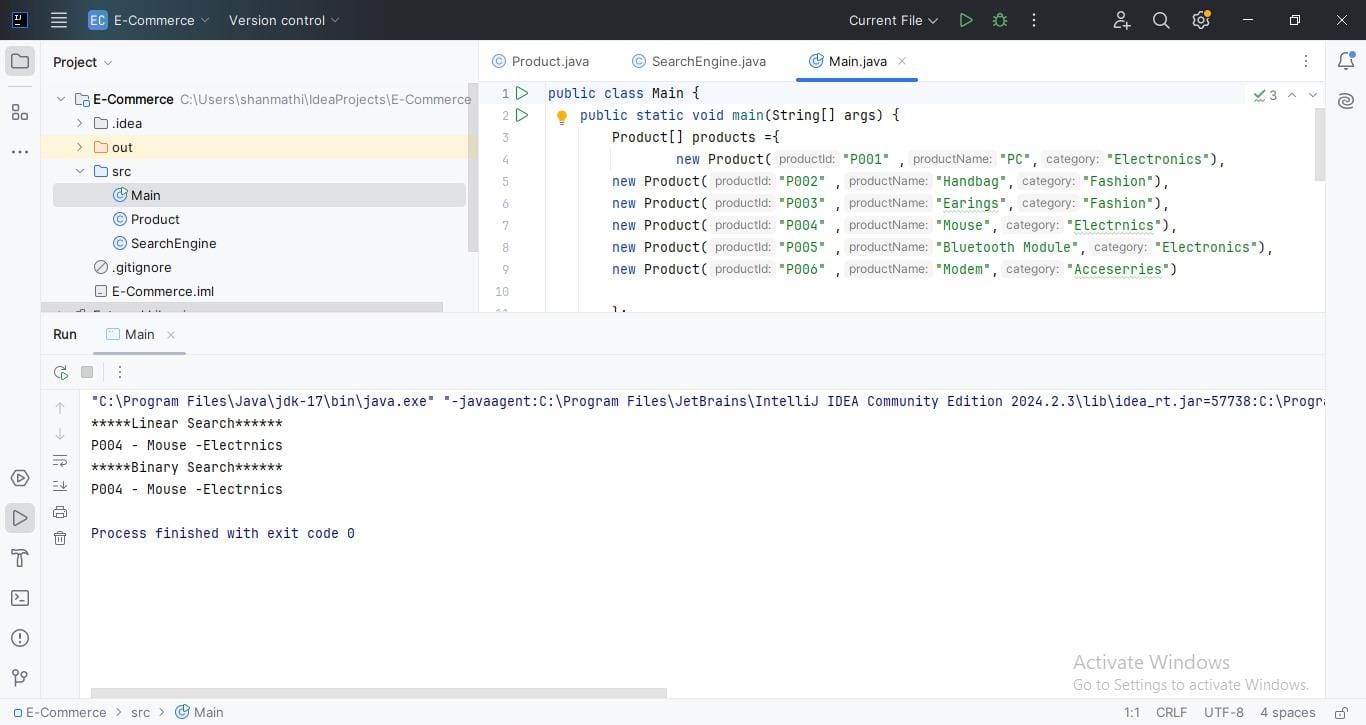
**SearchEngine.java**

import java.util.Arrays;  
import java.util.Comparator;  
  
public class SearchEngine {  
 public static Product linearSearch(Product[] products , String targetName){  
 for(Product p : products){  
 if(p.productName.equalsIgnoreCase(targetName)){  
 return p;  
 }  
 }  
 return null;  
 }  
 public static Product binarySearch(Product[] products , String targetName){  
 int left=0;  
 int right = products.length-1;  
 while(left<=right){  
 int mid = (left+right)/2;  
 int comparison= products[mid].productName.compareToIgnoreCase(targetName);  
 if(comparison==0){  
 return products[mid];  
 }  
 else if(comparison<0){  
 left = mid +1;  
 }  
 else{  
 right=mid-1;  
 }  
  
 }  
 return null;  
  
 }  
 public static void sortByName(Product[] products){  
 Arrays.*sort*(products, new Comparator<Product>() {  
 @Override  
 public int compare(Product p1, Product p2) {  
 return p1.productName.compareToIgnoreCase(p2.productName);  
 }  
 });  
 }  
}

**Main.java**

public class Main {  
 public static void main(String[] args) {  
 Product[] products ={  
 new Product("P001" ,"PC","Electronics"),  
 new Product("P002" ,"Handbag","Fashion"),  
 new Product("P003" ,"Earings","Fashion"),  
 new Product("P004" ,"Mouse","Electrnics"),  
 new Product("P005" ,"Bluetooth Module","Electronics"),  
 new Product("P006" ,"Modem","Acceserries")  
  
 };  
 System.*out*.println("\*\*\*\*\*Linear Search\*\*\*\*\*\*");  
 Product found1 = SearchEngine.*linearSearch*(products,"Mouse");  
 System.*out*.println(found1 != null? found1: "Product not found");  
  
 System.*out*.println("\*\*\*\*\*Binary Search\*\*\*\*\*\*");  
 SearchEngine.*sortByName*(products);  
 Product found2 = SearchEngine.*linearSearch*(products,"Mouse");  
 System.*out*.println(found2 != null? found2: "Product not found");  
  
  
 }  
}

**Analysis**

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