**Week-1**

**Data Structures and Algorithm**

**Exercise1 – E-Commerce**

**To Compare Linear Search And Binary Search**

**Product.java**

**public class Product {**

**private String Id;**

**private String Name;**

**private String type;**

**public Product(String Id, String Name,String type){**

**this.Id=Id;**

**this.Name=Name;**

**this.type= type;**

**}**

**public String getId() {**

**return Id;**

**}**

**public String getName() {**

**return Name;**

**}**

**public String getType() {**

**return type;**

**}**

**public String toString(){**

**return Id +" - " + Name + " -" + type;**

**}**

**}**

**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.getName().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].getName().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.getName().compareToIgnoreCase(p2.getName());**

**}**

**});**

**}**

**}**

**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);**

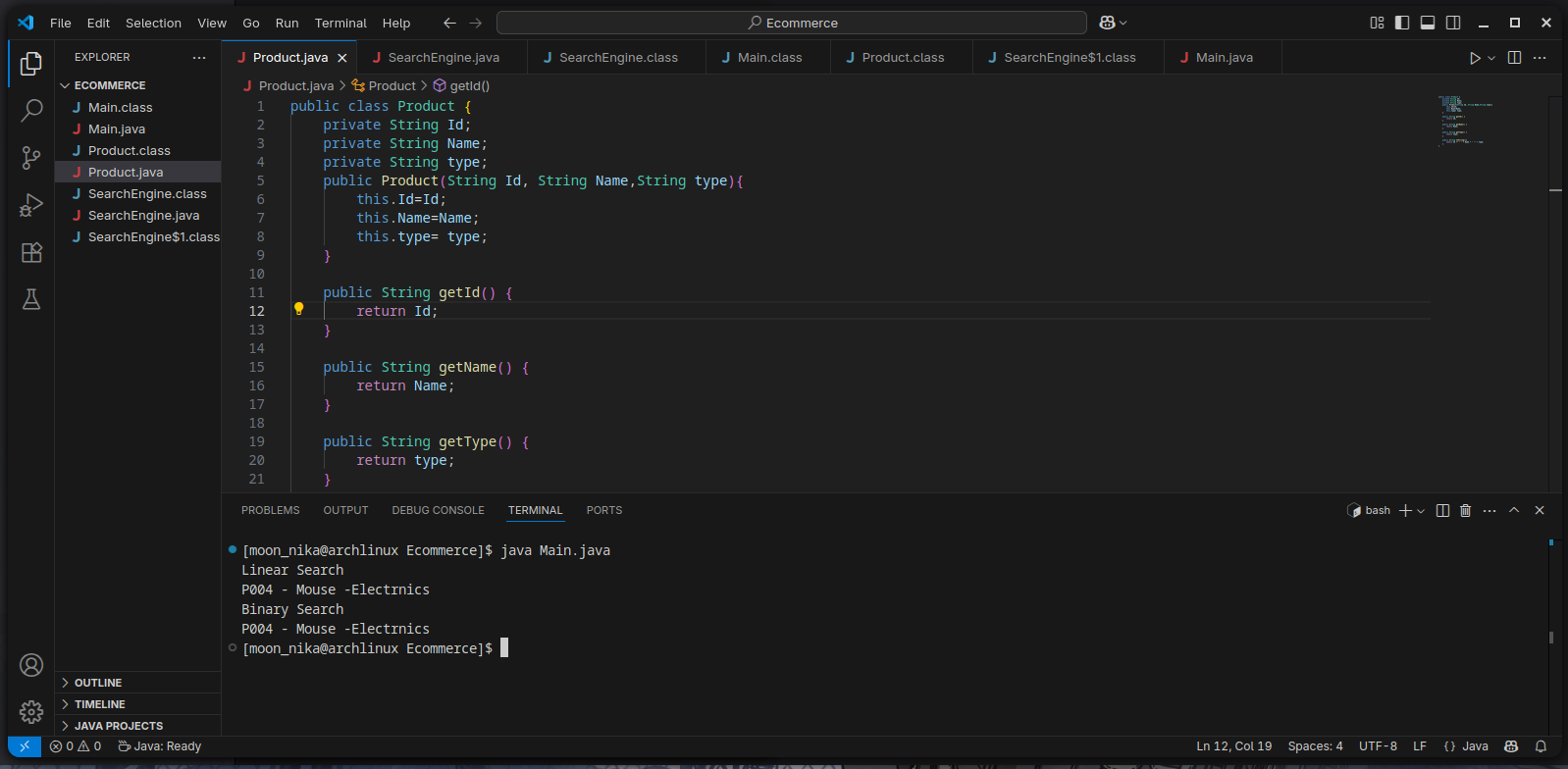
**Product found2 = SearchEngine.linearSearch(products,"Mouse");**

**System.out.println(found2 != null? found2: "Product not found");**

**}**

**}**

**Code image:**

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