**Exercise 2  
Implementing the E-Commerse Search Function**

Product.java:

**package** search;

**public** **class** Product {

**private** String name;

**private** **double** price;

**public** Product(String name, **double** price) {

**this**.name = name;

**this**.price = price;

}

**public** String getName() {

**return** name;

}

**public** **double** getPrice() {

**return** price;

}

**public** String toString()

{

**return** name+" - "+price;

}

}

SearchUtil.java:

**package** search;

**import** java.util.Collections;

**import** java.util.Comparator;

**import** java.util.List;

**public** **class** SearchUtils {

**public** **static** Product linearSearch(List<Product> products, String targetName) {

**for** (Product product : products) {

**if** (product.getName().equalsIgnoreCase(targetName)) {

**return** product;

}

}

**return** **null**;

}

**public** **static** Product binarySearch(List<Product> products, String targetName) {

Collections.*sort*(products, Comparator.*comparing*(Product::getName));

**int** left = 0, right = products.size() - 1;

**while** (left <= right) {

**int** mid = left + (right - left) / 2;

Product midProduct = products.get(mid);

**int** comparison = midProduct.getName().compareToIgnoreCase(targetName);

**if** (comparison == 0) **return** midProduct;

**else** **if** (comparison < 0) left = mid + 1;

**else** right = mid - 1;

}

**return** **null**;

}

}

SearchTest.java:

**package** search

**import** java.util.ArrayList;

**import** java.util.List;

**public** **class** SearchTest {

**public** **static** **void** main(String[] args) {

List<Product> products = **new** ArrayList<>();

products.add(**new** Product("Laptop", 50000));

products.add(**new** Product("Phone", 20000));

products.add(**new** Product("Tablet", 30000));

products.add(**new** Product("Watch", 5000));

String[] searchTerms = {"Tablet", "Phone", "Camera"};

**for** (String target : searchTerms) {

System.***out***.println("Searching for: " + target);

Product linearResult = SearchUtils.*linearSearch*(products, target);

**if** (linearResult != **null**) {

System.***out***.println("Linear Search Found: " + linearResult);

} **else** {

System.***out***.println("Linear Search Not Found");

}

Product binaryResult = SearchUtils.*binarySearch*(products, target);

**if** (binaryResult != **null**) {

System.***out***.println("Binary Search Found: " + binaryResult);

} **else** {

System.***out***.println("Binary Search Not Found");

}

}

}

}

**Output:**

