**Exercise 3: E-commerce Platform Search Function**

**Sol:**

**File Name:** Program.cs

using System;

using System.Collections.Generic;

public class Product

{

    public int ProductId { get; set; }

    public string ProductName { get; set; }

    public string Category { get; set; }

    public Product(int id, string name, string category)

    {

        ProductId = id;

        ProductName = name;

        Category = category;

    }

    public override string ToString()

    {

*return* $"ID: {ProductId}, Name: {ProductName}, Category: {Category}";

    }

}

class Program

{

    public static Product LinearSearch(List<Product> products, string name)

    {

*foreach* (var product *in* products)

        {

*if* (product.ProductName.Equals(name, StringComparison.OrdinalIgnoreCase))

*return* product;

        }

*return* null;

    }

    public static Product BinarySearch(List<Product> products, string name)

    {

        int left = 0, right = products.Count - 1;

*while* (left <= right)

        {

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

            int comparison = string.Compare(products[mid].ProductName, name, StringComparison.OrdinalIgnoreCase);

*if* (comparison == 0)

*return* *products*[mid];

*else* *if* (comparison < 0)

                left = mid + 1;

*else*

                right = mid - 1;

        }

*return* *null*;

    }

*static* *void* Main()

    {

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

        {

*new* Product(1, "Laptop", "Electronics"),

*new* Product(2, "Shoes", "Fashion"),

*new* Product(3, "Watch", "Accessories"),

*new* Product(4, "Phone", "Electronics"),

*new* Product(5, "Book", "Education")

        };

        Console.WriteLine("=== Linear Search ===");

*var* resultLinear = LinearSearch(products, "Book");

        Console.WriteLine(resultLinear != *null* ? resultLinear.ToString() : "Product not found");

        Console.WriteLine("\n=== Binary Search ===");

        products.Sort((*p1*, *p2*) => *string*.Compare(*p1*.ProductName, *p2*.ProductName, StringComparison.OrdinalIgnoreCase));

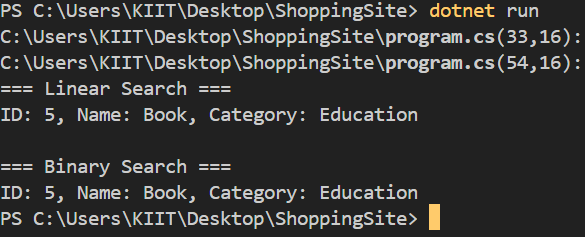
*var* resultBinary = BinarySearch(products, "Book");

        Console.WriteLine(resultBinary != *null* ? resultBinary.ToString() : "Product not found");

    }

}

**Output:**

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