Aim: Implementing search function for E-commerce platform

Using Data Structures and Algorithms.

Program:

using System;

using System.Collections.Generic;

public class Product

{

public int Id { get; set; }

public string Name { get; set; }

public string Description { get; set; }

public decimal Price { get; set; }

}

public class ECommerceSearch

{

private Dictionary<string, List<Product>> \_productIndex;

public ECommerceSearch(List<Product> products)

{

\_productIndex = new Dictionary<string, List<Product>>();

BuildIndex(products);

}

private void BuildIndex(List<Product> products)

{

foreach (var product in products)

{

// Index by product name

string name = product.Name.ToLower();

if (!\_productIndex.ContainsKey(name))

{

\_productIndex[name] = new List<Product>();

}

\_productIndex[name].Add(product);

// Index by description keywords (example)

string[] keywords = product.Description.ToLower().Split(' ');

foreach (var keyword in keywords)

{

if (!\_productIndex.ContainsKey(keyword))

{

\_productIndex[keyword] = new List<Product>();

}

\_productIndex[keyword].Add(product);

}

}

}

public List<Product> SearchProducts(string query)

{

query = query.ToLower();

if (\_productIndex.ContainsKey(query))

{

return \_productIndex[query];

}

return new List<Product>(); // Return empty list if no results

}

public static void Main(string[] args)

{

List<Product> products = new List<Product>

{

new Product { Id = 1, Name = "Laptop", Description = "High-performance laptop with SSD", Price = 1200.00m },

new Product { Id = 2, Name = "Smartphone", Description = "Latest smartphone with great camera", Price = 800.00m },

new Product { Id = 3, Name = "Headphones", Description = "Noise-cancelling over-ear headphones", Price = 150.00m },

new Product { Id = 4, Name = "Laptop Bag", Description = "Stylish laptop bag for travel", Price = 50.00m }

};

ECommerceSearch search = new ECommerceSearch(products);

// Example usage:

List<Product> results = search.SearchProducts("laptop");

Console.WriteLine("Search results for 'laptop':");

foreach (var product in results)

{

Console.WriteLine($"- {product.Name}: {product.Description}");

}

results = search.SearchProducts("camera");

Console.WriteLine("\nSearch results for 'camera':");

foreach (var product in results)

{

Console.WriteLine($"- {product.Name}: {product.Description}");

}

results = search.SearchProducts("headphones");

Console.WriteLine("\nSearch results for 'headphones':");

foreach (var product in results)

{

Console.WriteLine($"- {product.Name}: {product.Description}");

}

}

}

Output:

