public class product

{

    private int productid;

    private string productname;

    private string category;

    public product(int productid, string productname, string category)

    {

        this.productid = productid;

        this.productname = productname;

        this.category = category;

    }

    public int getproductid() { return productid; }

    public string getproductname() { return productname; }

    public string getcategory() { return category; }

    public override string ToString()

    {

        return productid + ": " + productname + " (" + category + ")";

    }

}

using System;

using System.Linq;

public class searchengine

{

    public static product linearsearch(product[] products, string name)

    {

        foreach (product p in products)

        {

            if (string.Equals(p.getproductname(), name, StringComparison.OrdinalIgnoreCase))

            {

                return p;

            }

        }

        return null;

    }

    public static product binarysearch(product[] products, string name)

    {

        int left = 0;

        int right = products.Length - 1;

        while (left <= right)

        {

            int mid = (left + right) / 2;

            int cmp = string.Compare(products[mid].getproductname(), name, true);

            if (cmp == 0) return products[mid];

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

            else right = mid - 1;

        }

        return null;

    }

    public static void sortproductsbyname(product[] products)

    {

        Array.Sort(products, (p1, p2) => string.Compare(p1.getproductname(), p2.getproductname(), true));

    }

}

using System;

class program

{

    static void Main(string[] args)

    {

        product[] products = {

            new product(101, "Laptop", "Electronics"),

            new product(102, "Shirt", "Clothing"),

            new product(103, "Shoes", "Footwear"),

            new product(104, "Mobile", "Electronics")

        };

        Console.WriteLine("Linear Search for 'Shoes':");

        product foundLinear = searchengine.linearsearch(products, "Shoes");

        Console.WriteLine(foundLinear != null ? "Found: " + foundLinear : "Not found");

        Console.WriteLine("\n🔍 Binary Search for 'Mobile':");

        searchengine.sortproductsbyname(products);

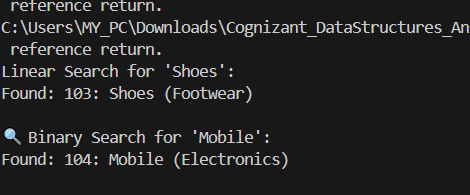
        product foundBinary = searchengine.binarysearch(products, "Mobile");

        Console.WriteLine(foundBinary != null ? "Found: " + foundBinary : "Not found");

    }

}

**OUTPUT:-**

****