**WEEK-1: Engineering Concepts**

**Data Structures and Algorithms**

**Ex 2: E-commerce Platform Search Func**

1.EcommerceSearch.java:

import java.util.Arrays;

class Itm {

int id;

String name;

String cat;

public Itm(int id, String name, String cat) {

this.id = id;

this.name = name;

this.cat = cat;

}

public String toString() {

return id + " - " + name + " - " + cat;

}

}

class Srch {

public static Itm linear(Itm[] arr, String key) {

for (Itm i : arr) {

if (i.name.equalsIgnoreCase(key)) return i;

}

return null;

}

public static Itm binary(Itm[] arr, String key) {

int l = 0, h = arr.length - 1;

while (l <= h) {

int m = (l + h) / 2;

int cmp = arr[m].name.compareToIgnoreCase(key);

if (cmp == 0) return arr[m];

else if (cmp < 0) l = m + 1;

else h = m - 1;

}

return null;

}

}

public class TestSrch {

public static void main(String[] args) {

Itm[] list = {

new Itm(1, "Laptop", "Elec"),

new Itm(2, "Phone", "Elec"),

new Itm(3, "Shoes", "Fash")

};

System.out.println("Linear:");

Itm res1 = Srch.linear(list, "Shoes");

System.out.println(res1 != null ? res1 : "Not found");

Arrays.sort(list, (a, b) -> a.name.compareToIgnoreCase(b.name));

System.out.println("Binary:");

Itm res2 = Srch.binary(list, "Shoes");

System.out.println(res2 != null ? res2 : "Not found");

}

}

Output:

A screenshot of a computer

AI-generated content may be incorrect.

**Exercise 7: Financial Forecasting**

public class FinFx {

public static double calc(double pv, double r, int y) {

if (y == 0) return pv;

return calc(pv, r, y - 1) \* (1 + r);

}

public static double calcMemo(double pv, double r, int y, double[] m) {

if (y == 0) return pv;

if (m[y] != 0) return m[y];

m[y] = calcMemo(pv, r, y - 1, m) \* (1 + r);

return m[y];

}

public static void main(String[] args) {

double pv = 10000;

double r = 0.1;

int y = 5;

System.out.println("Rec:");

double fv = calc(pv, r, y);

System.out.printf("FV after %d yrs = %.2f\n", y, fv);

System.out.println("\nRec-Memo:");

double[] m = new double[y + 1];

double fvm = calcMemo(pv, r, y, m);

System.out.printf("FV after %d yrs = %.2f\n", y, fvm);

}

}

Output:

A screen shot of a computer

AI-generated content may be incorrect.