ASSIGNMENT NO. : 3

import java.util.Arrays;

import java.util.Comparator;

class Item {

double value;

double weight;

Item(double value, double weight) {

this.value = value;

this.weight = weight;

}

// To calculate the value per weight

double getValuePerWeight() {

return value / weight;

}

}

public class FractionalKnapsack {

public static double getMaxValue(Item[] items, double capacity) {

// Sort items by value per weight in descending order

Arrays.sort(items, new Comparator<Item>() {

public int compare(Item a, Item b) {

return Double.compare(b.getValuePerWeight(), a.getValuePerWeight());

} });

double totalValue = 0.0;

for (Item item : items) {

if (capacity <= 0) {

break; // If the knapsack is full, break

}

if (item.weight <= capacity) {

// Take the whole item

totalValue += item.value;

capacity -= item.weight;

} else {

// Take the fraction of the item

totalValue += item.getValuePerWeight() \* capacity;

capacity = 0; // Knapsack is now full

}

}

return totalValue;

}

public static void main(String[] args) {

Item[] items = {

new Item(60, 10), // value=60, weight=10

new Item(100, 20), // value=100, weight=20

new Item(120, 30) // value=120, weight=30

};

double capacity = 50; // Knapsack capacity

double maxValue = getMaxValue(items, capacity);

System.out.printf("Maximum value in the knapsack = %.2f\n", maxValue);

}

}

**OUTPUT :**

Maximum value in the knapsack = 240.00