***Fractional KnapSack***

**Code :-**

import java.util.Arrays;

import java.util.\*;

public class FKnapSack {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

         System.out.println("Enter the Number of items : ");

         int n = sc.nextInt();

         int val[] = new int[n];

         int weight[] = new int[n];

        System.out.println("Enter the Value of the respective Weights....");

        for(int i = 0;i<val.length;i++){

             val[i] = sc.nextInt();

         }

        System.out.println("Enter the Weights....");

        for(int i = 0;i<weight.length;i++){

              weight[i] = sc.nextInt();

         }

        int W = 50;

        double ratio[][] = new double[val.length][2];

        for (int i = 0; i < val.length; i++) {

            ratio[i][0] = i;

            ratio[i][1] = val[i] / (double) weight[i];

        }

        System.out.println("----------------------------------------------------------------------------");

        System.out.println("The Values entered are.....\n");

        System.out.println("-------------------------");

        System.out.println("|Weight\t|Value\t|Ratio\t|");

        System.out.println("-------------------------");

        for(int  i =0;i<weight.length;i++){

            System.out.println("|"+weight[i]+"\t|"+val[i]+"\t|"+ratio[i][1]+"\t|");

        }

        System.out.println("-------------------------");

        System.out.println();

        System.out.println();;

        // Ascending Order Sorting

        Arrays.sort(ratio, Comparator.comparingDouble(o -> o[1]));

        int capacity = W;

        double finalVal = 0; // Use double to store fractional value

        System.out.println("----------------------------------------------------------------------------");

        System.out.println("The Calculation's are.....\n");

        System.out.println("---------------------------------------------------------");

        System.out.println("|Weight\t|Value\t|Ratio\t|Capacity\t|finalvalue\t|");

        System.out.println("---------------------------------------------------------");

        for (int i = ratio.length - 1; i >= 0; i--) {

            int index = (int) ratio[i][0];

            System.out.println("|"+weight[index]+"\t|"+val[index]+"\t|"+ratio[index][1]+"\t|"+capacity+"\t\t|"+finalVal+"\t\t|");

            if (capacity >= weight[index]) {

                finalVal += val[index]; // Use the original 'val' array

                capacity -= weight[index];

            } else {

                // for fractional item

                finalVal += (ratio[i][1] \* capacity);

                capacity = 0;

                System.out.println("|"+weight[index]+"\t|"+val[index]+"\t|"+ratio[index][1]+"\t|"+capacity+"\t\t|"+finalVal+"\t\t|");

                break;

            }

        }

        System.out.println("---------------------------------------------------------");

        System.out.println("Final Value : " + finalVal); // Output should be 240

        System.out.println("----------------------------------------------------------------------------");

    }

}

