#include <stdio.h>

struct Item {

int weight;

int profit;

};

void sortByWeight(struct Item items[], int n) {

struct Item temp;

for(int i=0; i<n-1; i++) {

for(int j=i+1; j<n; j++) {

if(items[i].weight > items[j].weight) {

temp = items[i];

items[i] = items[j];

items[j] = temp;

}

}

}

}

void sortByProfit(struct Item items[], int n) {

struct Item temp;

for(int i=0; i<n-1; i++) {

for(int j=i+1; j<n; j++) {

if(items[i].profit < items[j].profit) { // decreasing order

temp = items[i];

items[i] = items[j];

items[j] = temp;

}

}

}

}

void sortByRatio(struct Item items[], int n) {

struct Item temp;

for(int i=0; i<n-1; i++) {

for(int j=i+1; j<n; j++) {

double ratio1 = (double)items[i].profit / items[i].weight;

double ratio2 = (double)items[j].profit / items[j].weight;

if(ratio1 < ratio2) { // decreasing order

temp = items[i];

items[i] = items[j];

items[j] = temp;

}

}

}

}

void printItems(struct Item items[], int n) {

printf("Weight\tProfit\tRatio\n");

for(int i=0; i<n; i++) {

printf("%d\t%d\t%.2f\n", items[i].weight, items[i].profit,

(double)items[i].profit/items[i].weight);

}

printf("\n");

}

int main() {

int n;

printf("Enter number of items: ");

scanf("%d", &n);

struct Item items[n];

for(int i=0; i<n; i++) {

printf("Enter weight and profit for item %d: ", i+1);

scanf("%d%d", &items[i].weight, &items[i].profit);

}

printf("\nSorted by increasing weight:\n");

sortByWeight(items, n);

printItems(items, n);

printf("Sorted by decreasing profit:\n");

sortByProfit(items, n);

printItems(items, n);

printf("Sorted by decreasing profit/weight ratio:\n");

sortByRatio(items, n);

printItems(items, n);

return 0;

}

Output:

Enter number of items: 3

Enter weight and profit for item 1: 10 60

Enter weight and profit for item 2: 20 100

Enter weight and profit for item 3: 30 120