include <stdio.h>

void knapsack(int n, float weight[], float profit[], float capacity, floatratio[])

{ float x[20], tp = 0;

  int i, j, u, l, k;

  u = capacity;

  for (i = 0; i < n; i++)

  x[i] = 0.0;

  for (i = 0; i < n; i++)

  { if (weight[i] > u)

 break;

  else{ x[i] = 1.0;

  tp = tp + profit[i];

u = u - weight[i];}

}

  if (i < n)

  x[i] = u / weight[i];

  tp = tp + (x[i] \* profit[i]);

printf("\nThe Table After Sorting based on the Ratio:\n");

  printf("\nItem:\t\t");

  for (k = 0; k < n; k++)

  printf(" %d\t\t", k + 1);

 printf("\nProfit:\t\t");

 for (k = 0; k < n; k++)

  printf("%f\t", profit[k]);

 printf("\nWeights:\t");

 for (k = 0; k < n; k++)

  printf("%f\t", weight[k]);

 printf("\nRATIO:\t\t");

 for (k = 0; k < n; k++)

  printf("%f\t", ratio[k]);

printf("\n\nThe resultant vector is : ");

 for (i = 0; i < n; i++)

  printf("%f ", x[i]);

 printf("\n\nMaximum profit is : %f", tp);

}

int main()

{

 float weight[20], profit[20], capacity;

 int num, i, j;

 float ratio[20], temp;

 printf("Enter the no. of items:");

 scanf("%d", &num);

 printf("Enter profit and weight of all items\n");

 for (i = 0; i < num; i++)

 {

 printf("Enter the weight and profit of object:");

 scanf("%f %f", &weight[i], &profit[i]);

 }

 printf("Enter the capacity of knapsack:");

 scanf("%f", &capacity);

 for (i = 0; i < num; i++)

 {

 ratio[i] = profit[i] / weight[i];

 }

 for (i = 0; i < num; i++)

 {

 for (j = i + 1; j < num; j++)

 {

 if (ratio[i] < ratio[j])

 {

 temp = ratio[j];

 ratio[j] = ratio[i];

 ratio[i] = temp;

 temp = weight[j];

 weight[j] = weight[i];

 weight[i] = temp;

 temp = profit[j];

 profit[j] = profit[i];

 profit[i] = temp;

 }

 }

 }

 knapsack(num, weight, profit, capacity, ratio);

 return (0);

}

