```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Knapsack
{
      public class Item
   {
      public  int value;
      public  int weight;
      public  float density;
      public Item(int w, int v, float d)
      {
         value = v;
         weight = w;
         density = d;
      }
   }
   class Program
   {
      public static void KnapSack(int capacity, Item[] items, int itemsCount)
      {
         Item temp=new Item(0,0,0);
         //compute density = (value/weight)
         for (int i = 0; i < itemsCount; i++)
            items[i].density =(float) items[i].value / items[i].weight;
```

```
        //sort by density in descending order
        for (int i = 0; i < itemsCount; i++)
        {
            for (int j = 0; j < itemsCount - 1; j++)
            {
                if (items[j + 1].density > items[j].density)
                {
                    temp = items[j + 1];
                    items[j + 1] = items[j];
                    items[j] = temp;
                }
            }
        }
       int wt;
          float value=0;
          float totalWeight = 0, totalBenefit = 0;

          for(int i = 0; i < itemsCount; i++)
  {
                    if(items[i].weight + totalWeight <= capacity)
    {

                              totalWeight += items[i].weight;
                              totalBenefit += items[i].value;
         Console.WriteLine("Selected Item: "+ i + " Weight : "+ items[i].weight +" Value: "+ items[i].value +"
total weight "+totalWeight +" total benfit: "+ totalBenefit);
                    }
      else
      {
```

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                        wt = capacity -(int)totalWeight;
                        value = wt * (float)(items[i].value) / items[i].weight;

                        totalWeight += wt;
                        totalBenefit += value;
        Console.WriteLine("Selected Item: " + i + "   Weight : " + wt + "Value: " + value + "    total weight: "
+ totalWeight + "    total benfit: "+ totalBenefit);
                        break;
                    }
          }
        Console.WriteLine("total Weight "+ totalWeight);
        Console.WriteLine("total benfit "+ totalBenefit );
            }
      static void Main(string[] args)
      {
        Item [] items = new Item[6];
        items[0] = new Item(6, 6, 0);
        items[1] = new Item(10, 2, 0);
        items[2] = new Item(3, 1, 0);
        items[3] = new Item(5, 8, 0);
        items[4] = new Item(1, 3, 0);
        items[5] = new Item(3, 4, 0);

        int items_no = 6;
        int capacity = 16;
        KnapSack(capacity,items, items_no);
       }}}
```