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FLAT

ASSIGNMENT

FRACTIONAL KNAP SACK

Given the weights and profits of **N** items, in the form of **{profit, weight}** put these items in a knapsack of capacity **W** to get the maximum total profit in the knapsack. In **Fractional Knapsack**, we can break items for maximizing the total value of the knapsack.

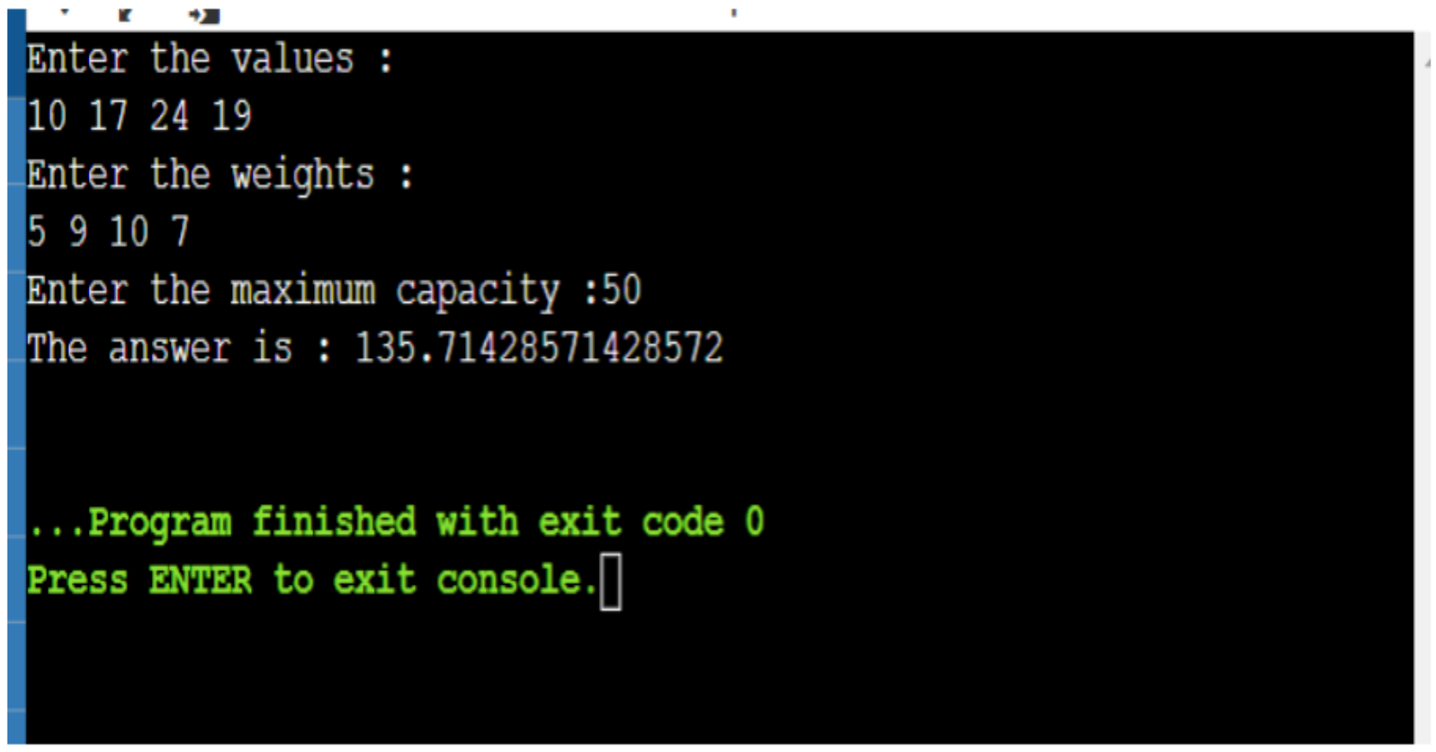
Input: *arr[] = {{60, 10}, {100, 20}, {120, 30}}, W = 50*
Output: *240*
Explanation: *By taking items of weight 10 and 20 kg and 2/3 fraction of 30 kg. Hence total price will be 60+100+(2/3)(120) = 240*
Input: *arr[] = {{500, 30}}, W = 10*
Output: *166.667*

PROGRAM TO IMPLEMENT FRACTIONAL KNAP SACK PROBLEM (In python)

```
def fracKnapsack(wt,val,W):
        n = len(wt)
        if n == 0:
              return 0
        else:
            maxRatioIndex = -1
             maxRatio = -1
            for i in range(n):
                    if val[i]/wt[i] > maxRatio:
                    maxRatioIndex = i
          maxRatio = val[i]/wt[i]
          maxVal = maxRatio*W
    return maxVal
print("Enter the values :")
```

```
val = list(map(int,input().split(' ')))

print("Enter the weights :")

wt = list(map(int,input().split(' ')))

W = int(input("Enter the maximum capacity :")

print("The answer is :",fracKnapsack(wt, val, W))
```

Output:



Applications :

The fractional knapsack problem has applications in many different fields. For example, in logistics, it can be used to determine the most efficient way to load a truck with a given set of items. In finance, it can be used to choose which investments to make in order to maximise return while staying within a budget. And in machine learning, it can be used as a sub-problem when training certain types of models.