

Lab 10

Student

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Q1.

0-1-knapsack(v, w, n, W)

For w= 0 to W $V[0,w] = 0$

For i =1 to n

 For w = 0 to W

 If $w[i] \leq w$ and $(v[i] + V[i-1, w-w[i]]) > V[i-1, w]$

$V[i, w] = v[i] + V[i-1, w-w[i]]$

 Item[i, w] =1;

 Else

$V[i, w] = V[i-1, w]$

 Item[i, w] =0

 K= W

For i =n downto 1

If item[i, K] == 1

 Output i

 K= K-w[i]

Return $V[n, W]$;

Q2.

The running time is $O(nW)$ where n is the number of items and W is the limit on the weight.

No, in this case DP has not changed the exponential running time although it has minimized the running time of the brute force method.

Q3.

We have 2 real inputs: items and total weight. The items and item combinations are limited and we can't take all items in our knapsack so the problem is polynomial but weight can be any number so representation of it can be polynomial.

