Quiz 10

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Program Description:

I uses Algorithm 5.7 in the text book just as the question asked. The programming language is Java.

The code is the same as the code in the text book, only one little thing needed to be modified to implement the algorithm in java: because the indexes of the arrays in the text book are started from 1, so the “i <= n” and “k <= n” in the text book should be changed to “i < n” and “k < n”, or the w[] and p[] array will overflow.

public static void knapsack(int i, int profit, int weight)
Inputs: the index of the item: i, the current profit, the current weight.
Outputs: none, the result is saved in the maxprofit variable and the bestSet[] boolean array.
Function: the Backtracking algorithm for the 0-1 Knapsack problem.

public static boolean promising(int i, int weight, int profit)
Inputs: i is the index of the item that waited to be tested, the current weight, the current profit.
Output: true if item i is promising, false otherwise.
Function: test whether the item i is promising.

Test Cases:

```
"C:\Program Files\Java\jdk-15.0.2\bin\ja
All the items:
i   pi  wi  pi/wi
1   20  2   10
2   30  5   6
3   35  7   5
4   12  3   4
5   3   1   3
Total weight is: 9

These items are included: 1 3
The maximum profit is 55

Process finished with exit code 0
```