Algorithms Assignment 7

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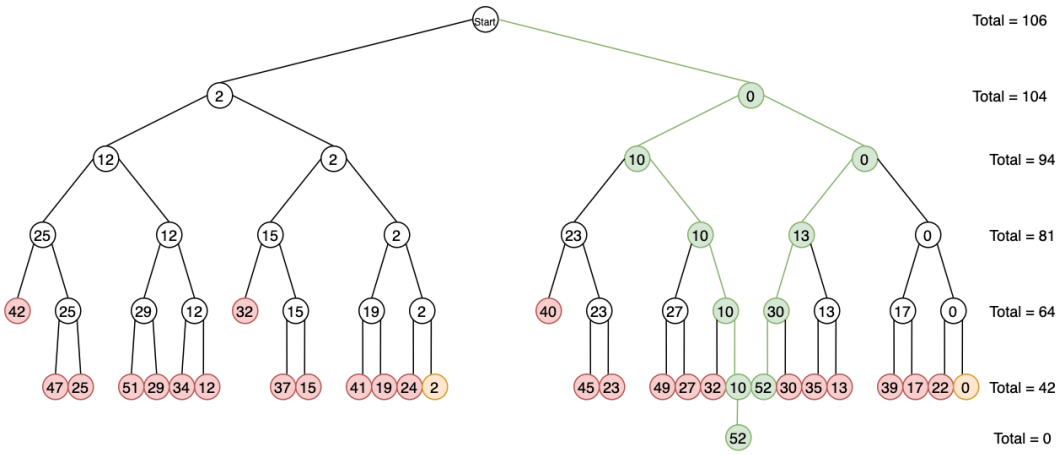
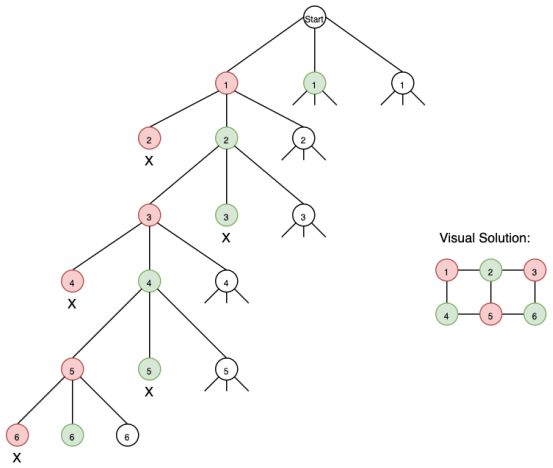
13. The pruned backtracking tree for the sum-of-subsets problem with $W = 52$ and weights: [2, 10, 13, 17, 22, 42] is below.
The red nodes represent unpromising nodes that fail the condition: $weights + w_{i+1} > W$
The orange nodes represent unpromising nodes that fail the condition: $weights + total < W$
The green nodes represent the solutions: [10, 42] and [13, 17, 22]



14. Implementation: assign7.py

18. Implementation: assign7.py
Pruning tree up to first solution:



All solutions:

[1, 2, 1, 2, 1, 2] [1, 2, 1, 2, 1, 3] [1, 2, 1, 2, 3, 2] [1, 2, 1, 3, 1, 2] [1, 2, 1, 3, 1, 3]
[1, 2, 3, 2, 1, 2] [1, 2, 3, 2, 3, 1] [1, 2, 3, 2, 3, 2] [1, 2, 3, 3, 1, 2] [1, 3, 1, 2, 1, 2]
[1, 3, 1, 2, 1, 3] [1, 3, 1, 3, 1, 2] [1, 3, 1, 3, 1, 3] [1, 3, 1, 3, 2, 3] [1, 3, 2, 2, 1, 3]
[1, 3, 2, 3, 1, 3] [1, 3, 2, 3, 2, 1] [1, 3, 2, 3, 2, 3] [2, 1, 2, 1, 2, 1] [2, 1, 2, 1, 2, 3]
[2, 1, 2, 1, 3, 1] [2, 1, 2, 3, 2, 1] [2, 1, 2, 3, 2, 3] [2, 1, 3, 1, 2, 1] [2, 1, 3, 1, 3, 1]
[2, 1, 3, 1, 3, 2] [2, 1, 3, 3, 2, 1] [2, 3, 1, 1, 2, 3] [2, 3, 1, 3, 1, 2] [2, 3, 1, 3, 1, 3]
[2, 3, 1, 3, 2, 3] [2, 3, 2, 1, 2, 1] [2, 3, 2, 1, 2, 3] [2, 3, 2, 3, 1, 3] [2, 3, 2, 3, 2, 1]
[2, 3, 2, 3, 2, 3] [3, 1, 2, 1, 2, 1] [3, 1, 2, 1, 2, 3] [3, 1, 2, 1, 3, 1] [3, 1, 2, 2, 3, 1]
[3, 1, 3, 1, 2, 1] [3, 1, 3, 1, 3, 1] [3, 1, 3, 1, 3, 2] [3, 1, 3, 2, 3, 1] [3, 1, 3, 2, 3, 2]
[3, 2, 1, 1, 3, 2] [3, 2, 1, 2, 1, 2] [3, 2, 1, 2, 1, 3] [3, 2, 1, 2, 3, 2] [3, 2, 3, 1, 3, 1]
[3, 2, 3, 1, 3, 2] [3, 2, 3, 2, 1, 2] [3, 2, 3, 2, 3, 1] [3, 2, 3, 2, 3, 2]