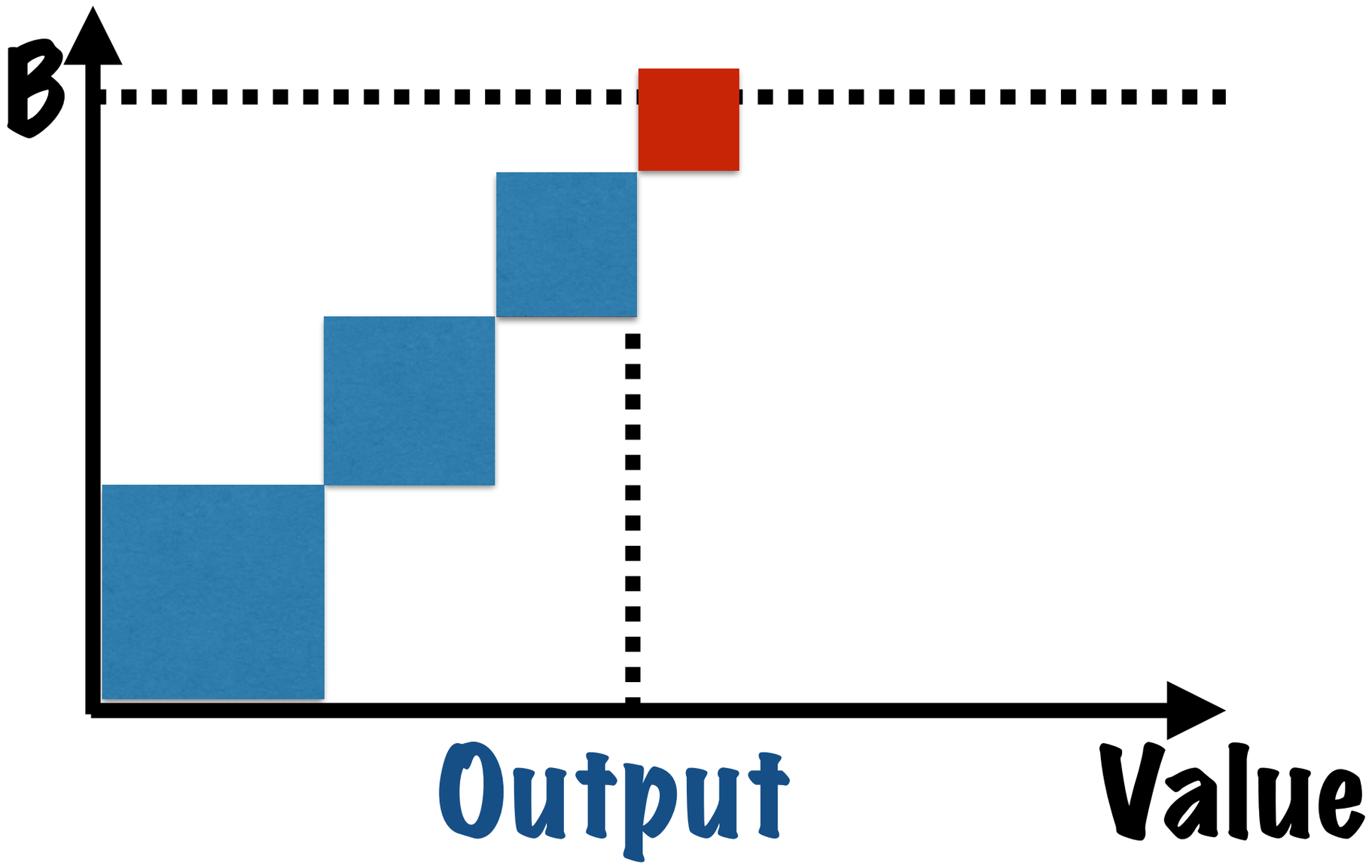
Knapsack and rounding

A greedy algorithm for special case size=value

Order items by decreasing value.

How good is that?

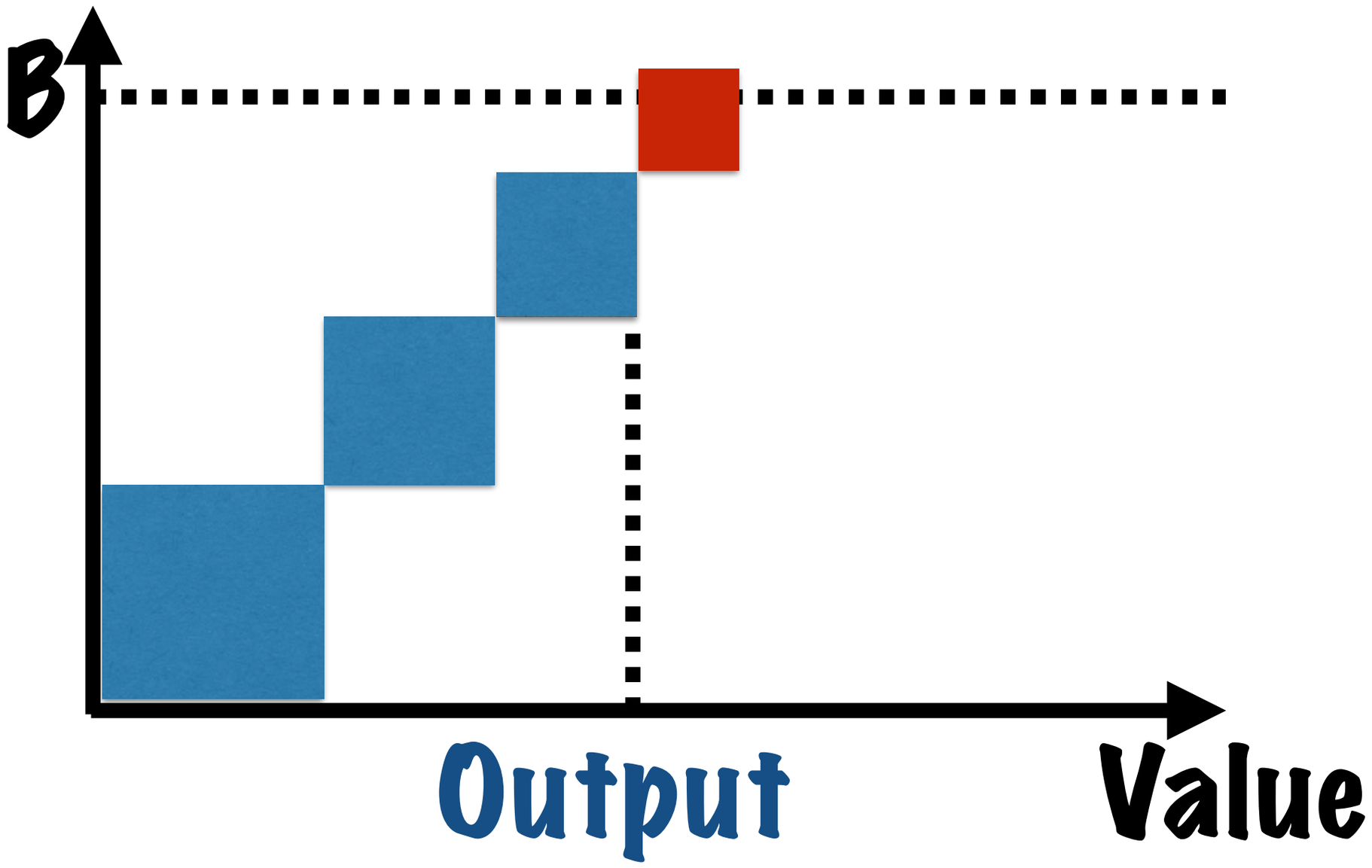
Observe: $\mathrm{OPT} \leq \mathrm{B}$



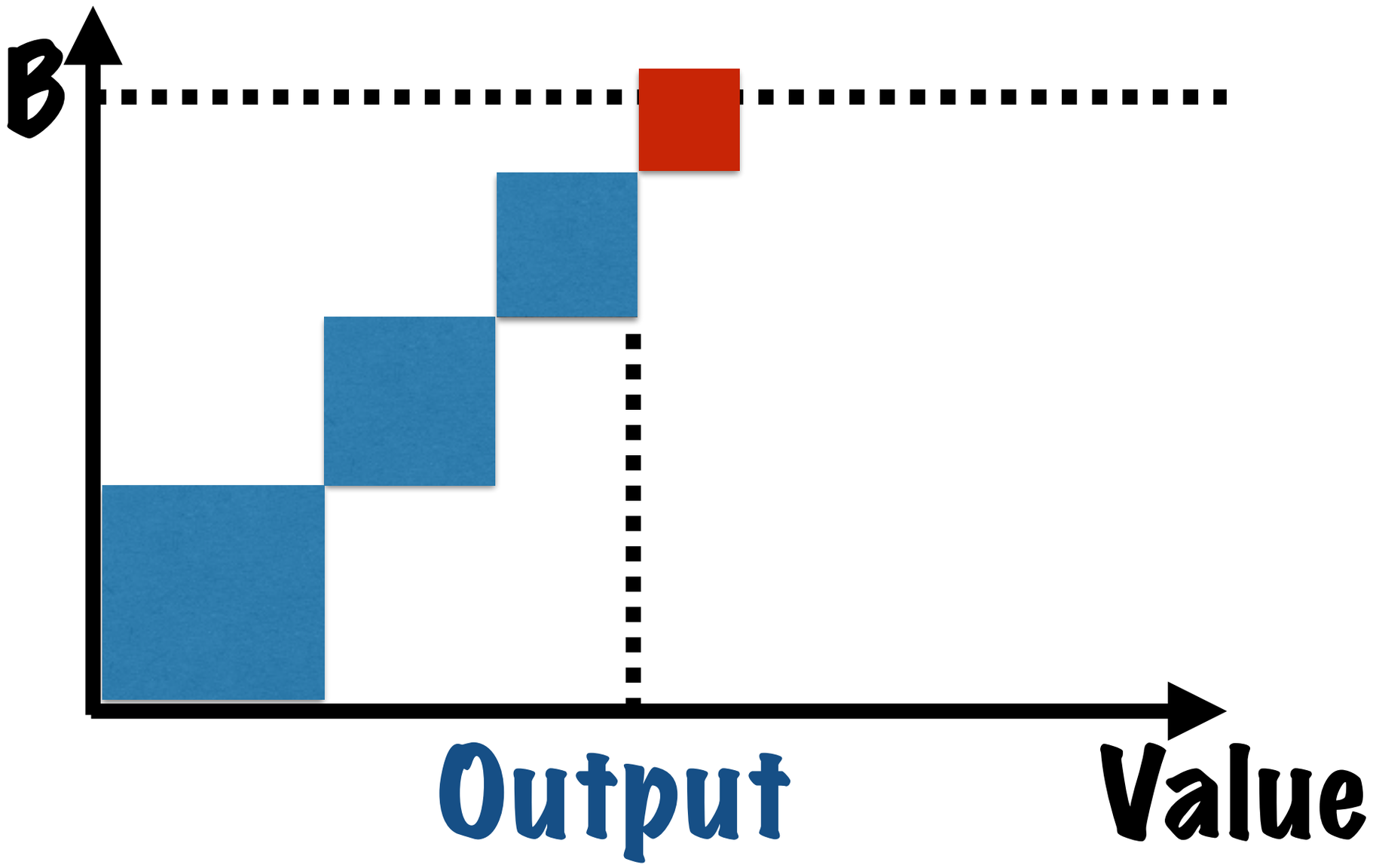
Observe: Output+1 item $>$ B

Can assume:

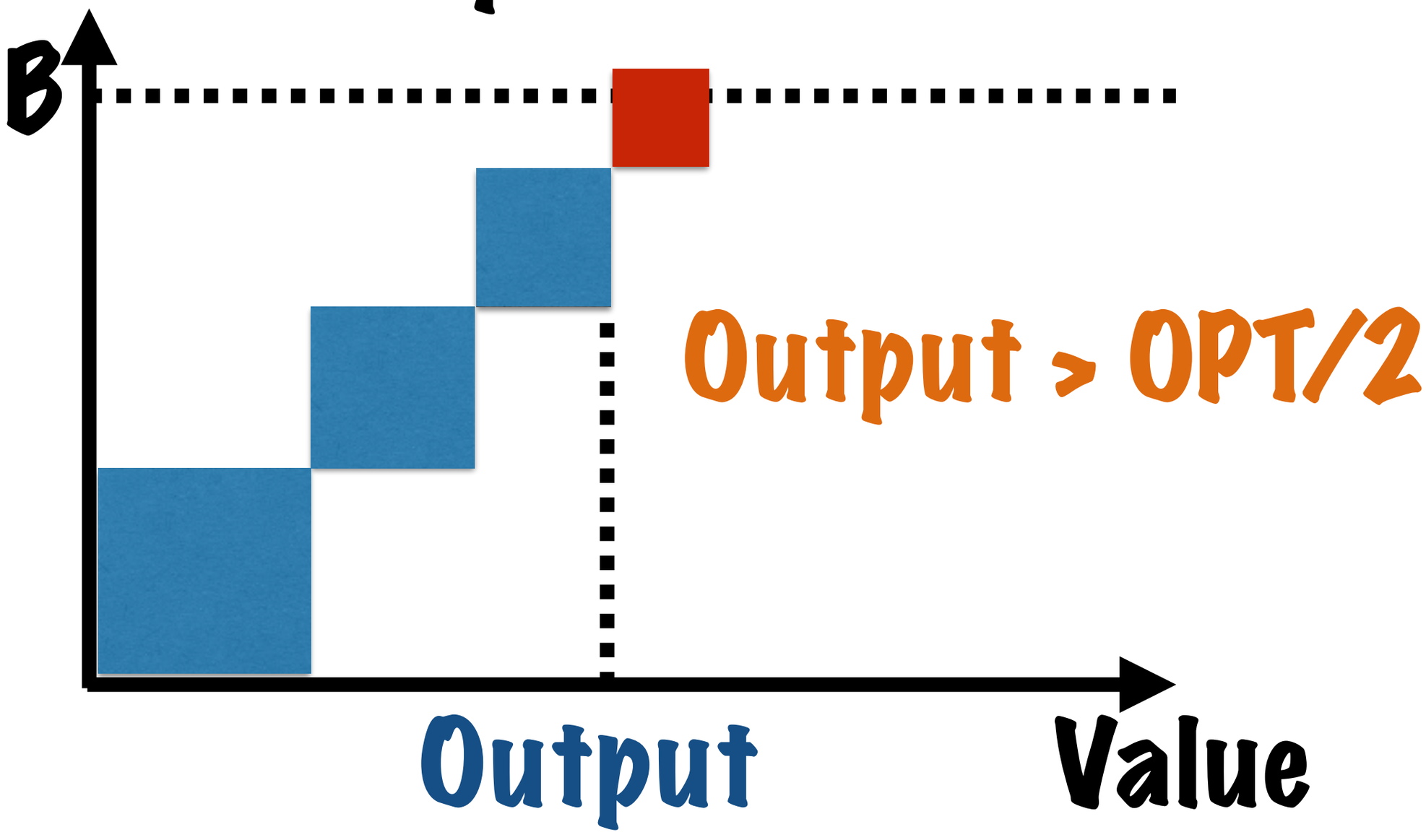
Output has at least 1 item



Observe: first item in output is better than item not in output



Combine: Output+red item > B
First output item > red item
Output > B/2



Theorem:
in special case size=value,
greedy is a 2-approximation.

Can we do better?

Knapsack and rounding