$\hat{c} := \cancel{c}$; U_{tot}
$p_{n+1} := \cancel{0}$; $+\infty$
$w_{n+1} := +\infty$;
$j := 1$;

2. [compute upper bound U_1]
   find $r = \min\{i : \sum_{k=j}^{i} w_k > \hat{c}\}$;
   if $r = n+1$ and $\hat{c} - \sum_{k=j}^{r-1} w_k > 0$ then go to 5;
   $u := \sum_{k=j}^{r-1} p_k + \lfloor (\hat{c} - \sum_{k=j}^{r-1} w_k) p_r / w_r \rfloor$;
   if $z \overset{\leq}{\cancel{\geq}} \hat{z} + u$ **then go to** 5; if $z == 0$ then go to 3;

3. [perform a forward step]
   while $w_j \leq \hat{c}$ **do**
      begin
         $\hat{c} := \hat{c} - w_j$;
         $\hat{z} := \hat{z} + p_j$;
         $\hat{x}_j := 1$;
         $j := j + 1$
      end;
   if $j \leq n$ **then**
      begin
         ~~$\hat{x}_j := 0$;~~ $\hat{x}_j = 1$; $\hat{c} = \hat{c} - w_j$; $\hat{z} = \hat{z} + p_j$;
         $j := j + 1$
      end;
   ~~(**if** $j < n$ **then go to** 2;)~~
   ~~(**if** $j = n$ **then go to** 3;)~~
   if $\hat{c} > 0$ then go to 5; // not a feasible solution

4. [update the best solution so far]
   if $\hat{z} \cancel{>} z$ or $z == 0$ **then**
   $<$ **begin**
         $z := \hat{z}$;
         for $k := 1$ **to** n **do** $x_k := \hat{x}_k$
      end;
   $j := n$;
   if $\hat{x}_n = 1$ **then**
      begin
         $\hat{c} := \hat{c} + w_n$;
         $\hat{z} := \hat{z} - p_n$;
         $\hat{x}_n := 0$
      end;

5. [backtrack]
   find $i = \max\{k < j : \hat{x}_k = 1\}$;
   if no such i **then return** ;
   $\hat{c} := \hat{c} + w_i$;
   $\hat{z} := \hat{z} - p_i$;
   $\hat{x}_i := 0$;
   $j := i + 1$;
   go to 2

end.