

**FCT/Unesp – Presidente Prudente**  
**Departamento de Matemática e Computação**

# Projeto e Análise de Algoritmos: Programação Dinâmica

## *Knapsack Problem ou Mochila 01* ou Mochila Booleana

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(apresentação adaptada: ver referências no final)

# Configuração do Problema

- Capacidade (C) = 15
- Itens {valor, peso}:
  - {11,6}
  - {9,5}
  - {18,8}
  - {6,2}
  - {7,3}
  - {3,1}

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0										

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0										

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11									

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1									

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11								

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1								

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11							

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1							

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1



$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
$\{9,5\}$	0	0	0	0	0											

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0											

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
$\{9,5\}$	0	0	0	0	0	9										

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1										

Solução Anterior  
para c: 11

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11									

Solução Anterior  
que Permita  
Adicionar o item  
atual:  $0 + 9 = 9$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0									

Solução Anterior para c: 11

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11								

Solução Anterior que Permita Adicionar o item atual:  $0 + 9 = 9$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0								

Solução Anterior para c: 11

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11							

Solução Anterior que Permita Adicionar o item atual:  $0 + 9 = 9$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0							

Solução Anterior para c: 11

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11					

Solução Anterior que Permita Adicionar o item atual:  $0 + 9 = 9$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0					

Solução Anterior para c: 11

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20				

Solução Anterior que Permita Adicionar o item atual:  $11 + 9 = 20$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1				

Solução Anterior para c: 11

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20			

Solução Anterior que Permita Adicionar o item atual:  $11 + 9 = 20$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1			



$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
$\{9,5\}$	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
$\{9,5\}$	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
$\{18,8\}$	0	0	0	0	0	9	11	11								

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0								

Solução Anterior para c: 11

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18							

Solução Anterior que Permita Adicionar o item atual:  $0 + 18 = 18$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1							

Solução Anterior para c: 11

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18						

Solução Anterior que Permita Adicionar o item atual:  $0 + 18 = 18$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1						

Solução Anterior para c: 11

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18					

Solução Anterior que Permita Adicionar o item atual:  $0 + 18 = 18$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1					

Solução Anterior para c: 20

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20				

Solução Anterior que Permita Adicionar o item atual:  $0 + 18 = 18$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0				

Solução Anterior para c: 20

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20			

Solução Anterior que Permita Adicionar o item atual:  $0 + 18 = 18$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0			

Solução Anterior para c: 20

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27		

Solução Anterior que Permita Adicionar o item atual:  $9 + 18 = 27$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1		



Solução Anterior para c: 20

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	

Solução Anterior que Permita Adicionar o item atual:  $11 + 18 = 29$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	

Solução Anterior para c: 20

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29

Solução Anterior que Permita Adicionar o item atual: 11 + 18 = 29

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
$\{9,5\}$	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
$\{18,8\}$	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
$\{6,2\}$	0	0														

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
$\{6,2\}$	0	0														

Solução Anterior para c: 0

Solução Anterior que Permita Adicionar o item atual:  $0 + 6 = 6$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6													

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1													

Solução Anterior para c: 0

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6												

Solução Anterior que Permita Adicionar o item atual:  $0 + 6 = 6$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1												

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
$\{9,5\}$	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
$\{18,8\}$	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
$\{6,2\}$	0	0	6	6	6											

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
$\{6,2\}$	0	0	1	1	1											

Solução Anterior para c: 9

Solução Anterior que Permita Adicionar o item atual:  $0 + 6 = 6$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9										

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0										

Solução Anterior para c: 11

Solução Anterior que Permita Adicionar o item atual:  $0 + 6 = 6$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11									

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0									



Solução Anterior para c: 11

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15								

Solução Anterior que Permita Adicionar o item atual:  $9 + 6 = 15$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1								

Solução Anterior para c: 18

Solução Anterior que Permita Adicionar o item atual:  $11 + 6 = 17$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18							

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0							

Solução Anterior para c: 18

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18						

Solução Anterior que Permita Adicionar o item atual:  $11 + 6 = 17$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0						

Solução Anterior para c: 18

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24					

Solução Anterior que Permita Adicionar o item atual:  $18 + 6 = 24$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1					

Solução Anterior para c: 20

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24				

Solução Anterior que Permita Adicionar o item atual:  $18 + 6 = 24$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1				

Solução Anterior para c: 20

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24			

Solução Anterior que Permita Adicionar o item atual:  $18 + 6 = 24$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1			

Solução Anterior para c: 27

Solução Anterior que Permita Adicionar o item atual:  $20 + 6 = 26$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27		

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0		

Solução Anterior para c: 29

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	

Solução Anterior que Permita Adicionar o item atual:  $20 + 6 = 26$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	



Solução Anterior para c: 29

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33

Solução Anterior que Permita Adicionar o item atual:  $27 + 6 = 33$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
$\{9,5\}$	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
$\{18,8\}$	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
$\{6,2\}$	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
$\{7,3\}$	0	0														

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
$\{6,2\}$	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
$\{7,3\}$	0	0														

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
$\{9,5\}$	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
$\{18,8\}$	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
$\{6,2\}$	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
$\{7,3\}$	0	0	6													

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
$\{6,2\}$	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
$\{7,3\}$	0	0	0													

Solução Anterior para c: 6

Solução Anterior que Permita Adicionar o item atual:  $0 + 7 = 7$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7												

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1												

Solução Anterior para c: 6

Solução Anterior que Permita Adicionar o item atual:  $0 + 7 = 7$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7											

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1											

Solução Anterior para c: 9

Solução Anterior que Permita Adicionar o item atual:  $6 + 7 = 13$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13										

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1										

Solução Anterior para c: 11

Solução Anterior que Permita Adicionar o item atual:  $6 + 7 = 13$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13									

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1									

Solução Anterior para c: 15

Solução Anterior que Permita Adicionar o item atual:  $6 + 7 = 13$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15								

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0								



Solução Anterior para c: 18

Solução Anterior que Permita Adicionar o item atual:  $9 + 7 = 16$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18							

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0							

Solução Anterior para c: 18

Solução Anterior que Permita Adicionar o item atual:  $11 + 7 = 18$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18						

No caso de empate, deve-se escolher qualquer um, mas mantendo sempre a consistência na escolha

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1						

Solução Anterior para c: 24

Solução Anterior que Permita Adicionar o item atual:  $15 + 7 = 22$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24					

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0					

Solução Anterior para c: 24

Solução Anterior que Permita Adicionar o item atual:  $18 + 7 = 25$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25				

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1				

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25			

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1			

Solução Anterior para c: 27

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31		

Solução Anterior que Permita Adicionar o item atual:  $24 + 7 = 31$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1		

Solução Anterior para c: 29

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	

Solução Anterior que Permita Adicionar o item atual:  $24 + 7 = 31$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	

Solução Anterior para c: 33

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33

Solução Anterior que Permita Adicionar o item atual:  $24 + 7 = 31$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-,-}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0



{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0															

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0															

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3														

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1														

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6													

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0													

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9												

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1												

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9	10											

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1											

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9	10	13										

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0										

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9	10	13	16									

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1									

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9	10	13	16	16								

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1	1								



$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
$\{9,5\}$	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
$\{18,8\}$	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
$\{6,2\}$	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
$\{7,3\}$	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
$\{3,1\}$	0	3	6	9	10	13	16	16	18							

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
$\{6,2\}$	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
$\{7,3\}$	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
$\{3,1\}$	0	1	0	1	1	0	1	1	1							

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9	10	13	16	16	18	21						

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1	1	1	1						

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9	10	13	16	16	18	21	24					

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1	1	1	1	0					

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
$\{9,5\}$	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
$\{18,8\}$	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
$\{6,2\}$	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
$\{7,3\}$	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
$\{3,1\}$	0	3	6	9	10	13	16	16	18	21	24	27				

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
$\{6,2\}$	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
$\{7,3\}$	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
$\{3,1\}$	0	1	0	1	1	0	1	1	1	1	0	1				

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9	10	13	16	16	18	21	24	27	28			

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1	1	1	1	0	1	1			

Solução Anterior para c: 31

Solução Anterior que Permita Adicionar o item atual:  $25 + 3 = 28$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9	10	13	16	16	18	21	24	27	28	31		

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1	1	1	1	0	1	1	0		

Solução Anterior para c: 31

Solução Anterior que Permita Adicionar o item atual:  $31 + 3 = 34$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9	10	13	16	16	18	21	24	27	28	31	34	

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	

Solução Anterior para c: 31

Solução Anterior que Permita Adicionar o item atual:  $31 + 3 = 34$

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9	10	13	16	16	18	21	24	27	28	31	34	34

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1



{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	11	11	11	11	11	11	11	11	11	11
{9,5}	0	0	0	0	0	9	11	11	11	11	11	20	20	20	20	20
{18,8}	0	0	0	0	0	9	11	11	18	18	18	20	20	27	29	29
{6,2}	0	0	6	6	6	9	11	15	18	18	24	24	24	27	29	33
{7,3}	0	0	6	7	7	13	13	15	18	18	24	25	25	31	31	33
{3,1}	0	3	6	9	10	13	16	16	18	21	24	27	28	31	34	34

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	<div style="border: 1px solid red; padding: 10px; text-align: center;"> <p>A melhor solução tem valor 34</p> </div>							1	1	1	
{9,5}	0	0	0	0	0								1	1	1	
{18,8}	0	0	0	0	0								1	1	1	
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1

Para recuperar os itens que fazem parte da solução utilizaremos a matriz abaixo.  
 Procuraremos o primeiro item que fez parte da solução, que é aquele que possui valor 1 na última coluna, percorrendo-a de baixo para cima até encontra-lo

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1

No caso, o primeiro elemento encontrado que faz parte da solução é o  $\{3,1\}$

Para encontrar os demais, fazemos a remoção desse elemento da capacidade do subproblema atual

Ou seja,  $15 - 1$ , levando a um subproblema de capacidade 14. Nele, faremos a mesma busca, isto é, tentaremos encontrar o elemento que tem valor 1 na coluna de capacidade 14

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
$\{6,2\}$	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
$\{7,3\}$	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
$\{3,1\}$	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1

No caso, o elemento encontrado que faz parte da solução é o  $\{7,3\}$

Para encontrar os demais, fazemos a remoção desse elemento da capacidade do subproblema atual

Ou seja,  $14 - 3$ , levando a um subproblema de capacidade 11. Nele, faremos a mesma busca, isto é, tentaremos encontrar o elemento que tem valor 1 na coluna de capacidade 11

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
$\{6,2\}$	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
$\{7,3\}$	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
$\{3,1\}$	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1

No caso, o elemento encontrado que faz parte da solução é o  $\{6,2\}$

Para encontrar os demais, fazemos a remoção desse elemento da capacidade do subproblema atual

Ou seja,  $11 - 2$ , levando a um subproblema de capacidade 9. Nele, faremos a mesma busca, isto é, tentaremos encontrar o elemento que tem valor 1 na coluna de capacidade 9

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
$\{6,2\}$	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
$\{7,3\}$	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
$\{3,1\}$	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1

No caso, o elemento encontrado que faz parte da solução é o  $\{18,8\}$

Para encontrar os demais, fazemos a remoção desse elemento da capacidade do subproblema atual

Ou seja,  $9 - 8$ , levando a um subproblema de capacidade 1. Nele, faremos a mesma busca, isto é, tentaremos encontrar o elemento que tem valor 1 na coluna de capacidade 1

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1
$\{6,2\}$	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
$\{7,3\}$	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
$\{3,1\}$	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1

No caso, o elemento encontrado que faz parte da solução é o  $\{18,8\}$   
 Para encontrar os demais, fazemos a remoção desse elemento da capacidade do subproblema atual  
 Ou seja,  $9 - 8$ , levando a um subproblema de capacidade 1. Nele, faremos a mesma busca, isto é,  
 tentaremos encontrar o elemento que tem valor 1 na coluna de capacidade 1

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
$\{6,2\}$	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
$\{7,3\}$	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
$\{3,1\}$	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1

No caso, o elemento encontrado que faz parte da solução é o  $\{18,8\}$

Para encontrar os demais, fazemos a remoção desse elemento da capacidade do subproblema atual

Ou seja,  $9 - 8$ , levando a um subproblema de capacidade 1. Nele, faremos a mesma busca, isto é, tentaremos encontrar o elemento que tem valor 1 na coluna de capacidade 1

Quando não é encontrado, procuramos na linha anterior, até encontrar algum objeto que faz parte da solução, isto é, valor igual a 1, ou quando chegamos até o fim da tabela

$\{v,w\}$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\{-,-\}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\{11,6\}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
$\{9,5\}$	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
$\{18,8\}$	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
$\{6,2\}$	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
$\{7,3\}$	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
$\{3,1\}$	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1



No caso, o elemento encontrado que faz parte da solução é o {18,8}

Para encontrar os demais, fazemos a remoção desse elemento da capacidade do subproblema atual

Ou seja,  $9 - 8$ , levando a um subproblema de capacidade 1. Nele, faremos a mesma busca, isto é, tentaremos encontrar o elemento que tem valor 1 na coluna de capacidade 1

Quando não é encontrado, procuramos na linha anterior, até encontrar algum objeto que faz parte da solução, isto é, valor igual a 1, ou quando chegamos até o fim da tabela

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1

Os itens que fazem parte da solução são:

{18, 8}

{6, 2}

{7, 3}

{3, 1}

Eles acumularam o valor 34 e peso 14

Note que não eles não ocuparam toda a capacidade da mochila,  
mas maximizaram o valor agregado a ela

{v,w}	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
{-, -}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
{11,6}	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
{9,5}	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1
{18,8}	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1
{6,2}	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	1
{7,3}	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	0
{3,1}	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1

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