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Dijkstra

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problem)

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Dijkstra

(shortest path

Dijkstra

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v

$s =$

s

v

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Dijkstra

s

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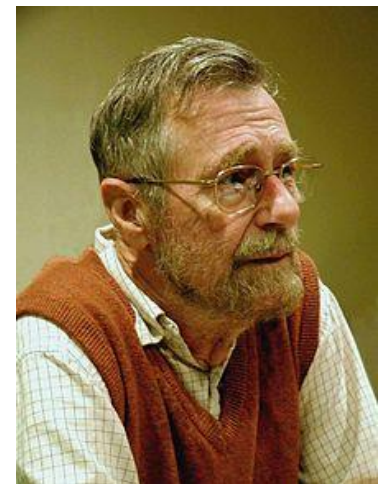
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BFS

Edsger Wybe Dijkstra
1930-2002



Dijkstra

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s $\%oo$ $+$ $,$

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v v $d(v)$
 v s

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u

$d(u)$

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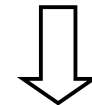
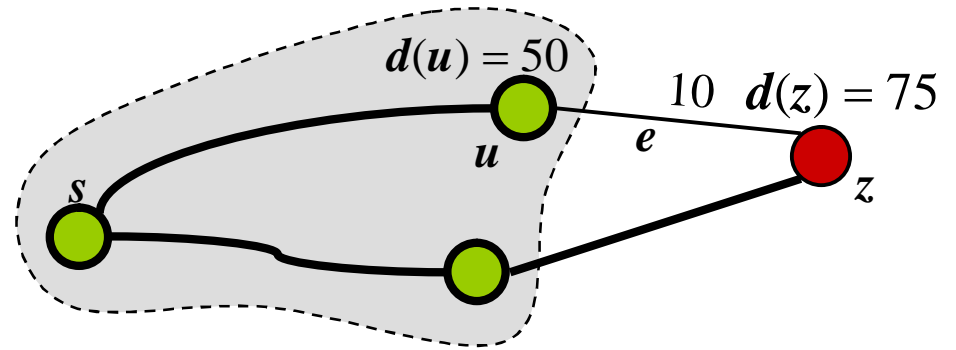
u

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$$e = (u, z)$$

ó u

ó z



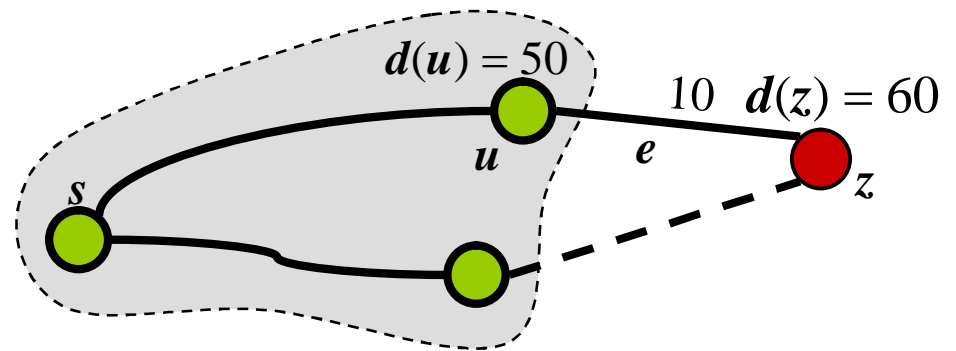
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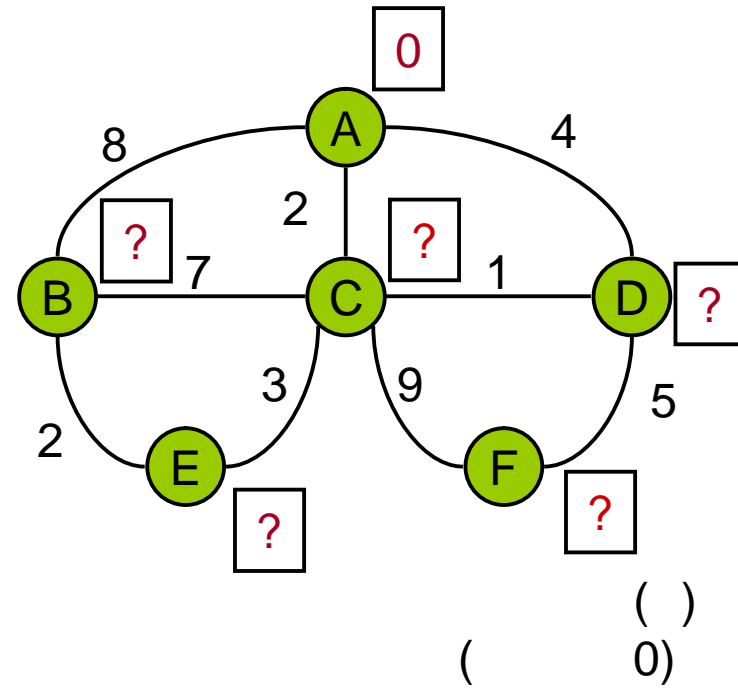
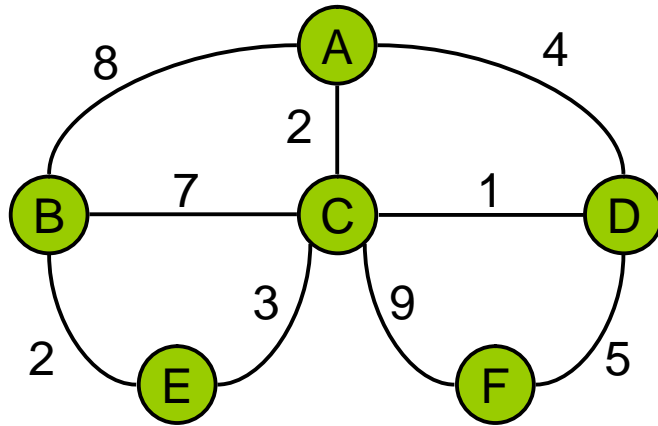
$d(z)$

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$$d(z) \leftarrow \min\{d(z), d(u) + \text{weight}(e)\}$$

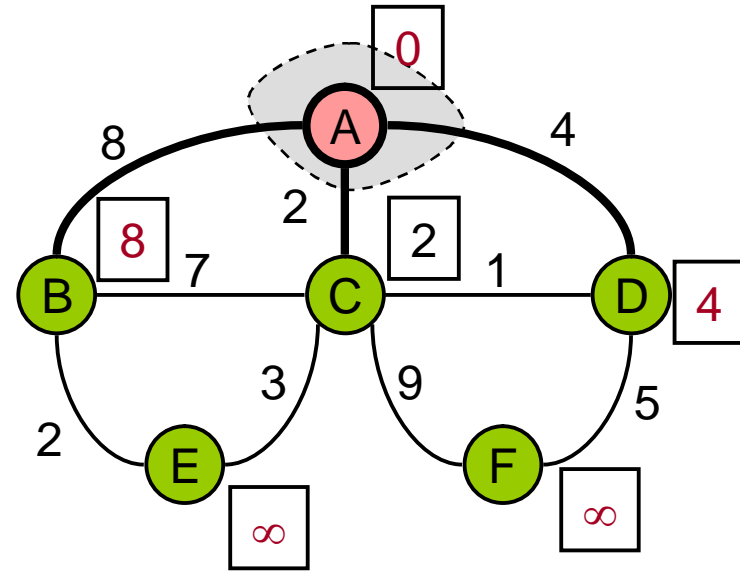
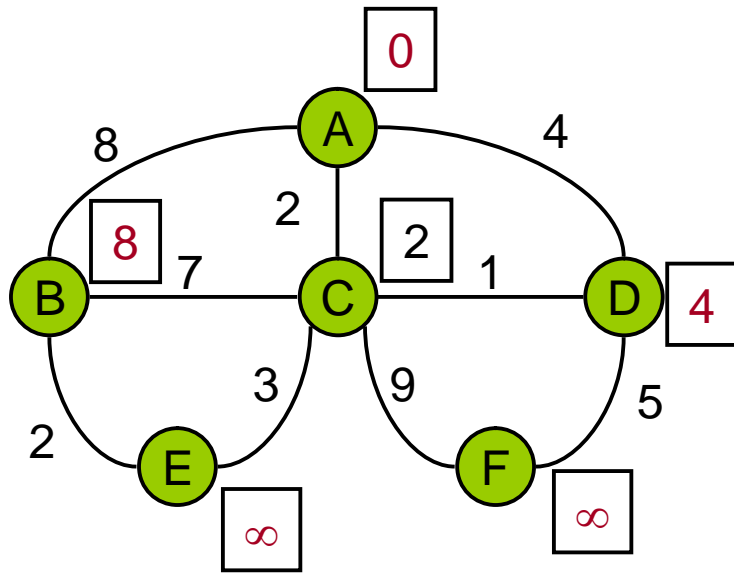


Dijkstra



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Dijkstra



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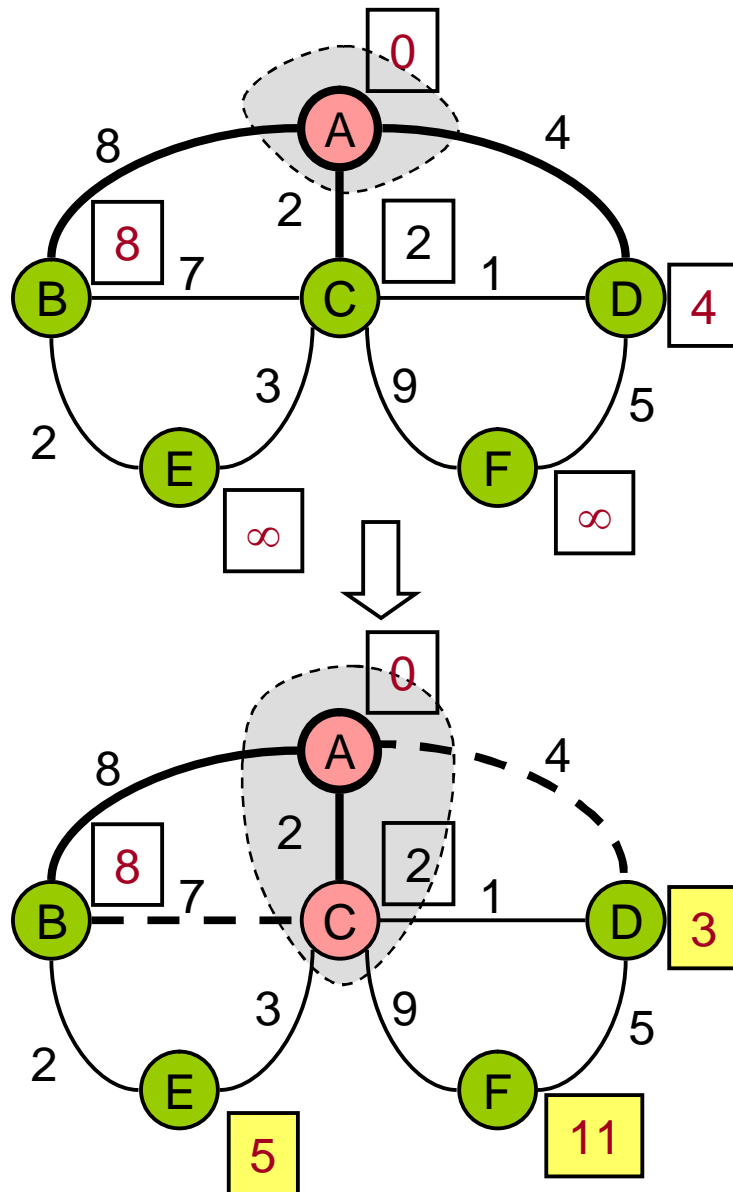
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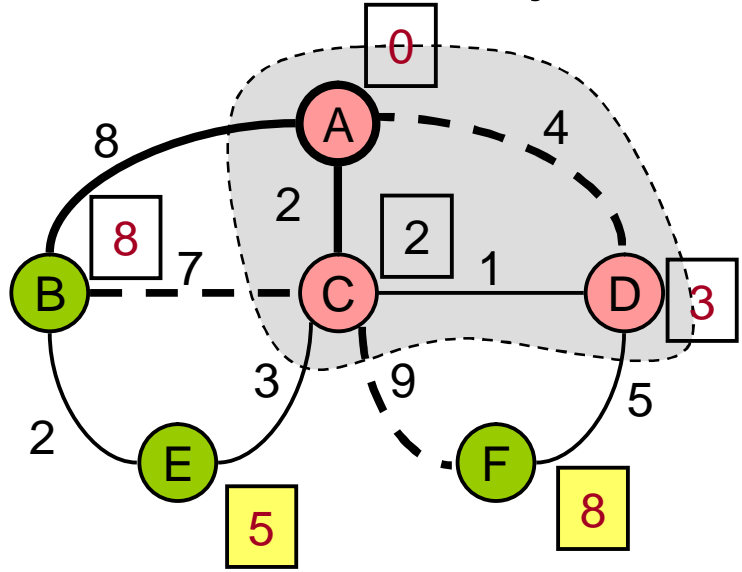
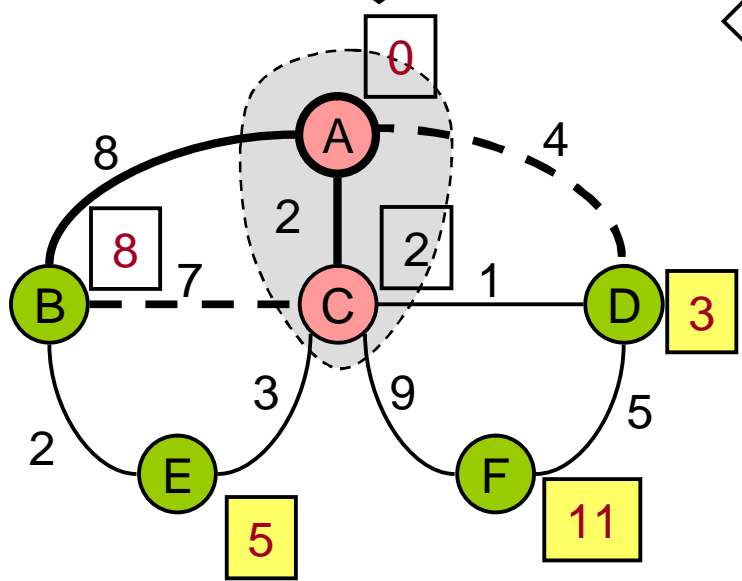
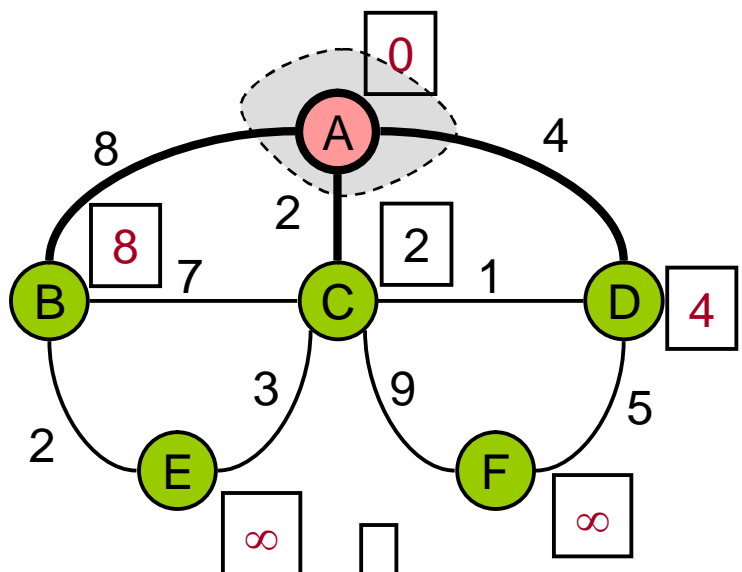
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Dijkstra



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 -- , 8
 -- C 2
 -- D 4
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Dijkstra



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-- 8
 -- 5
 -- F 11
 -- D 3

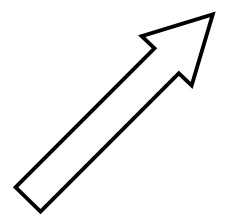
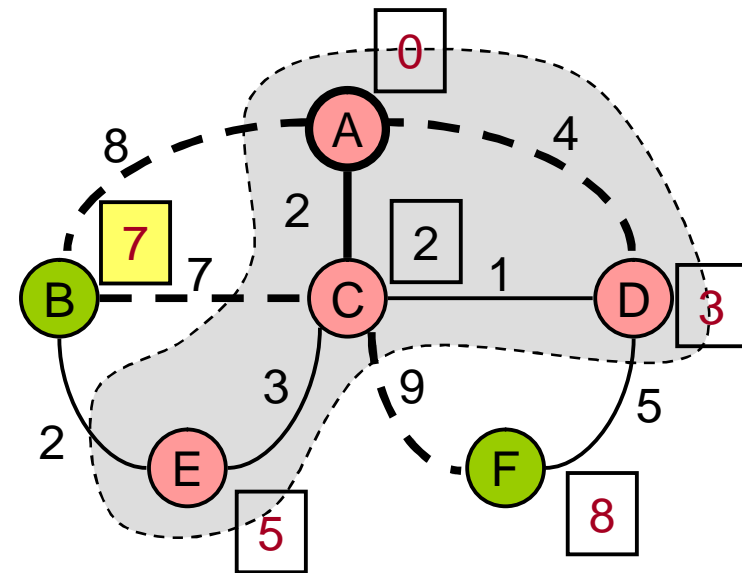
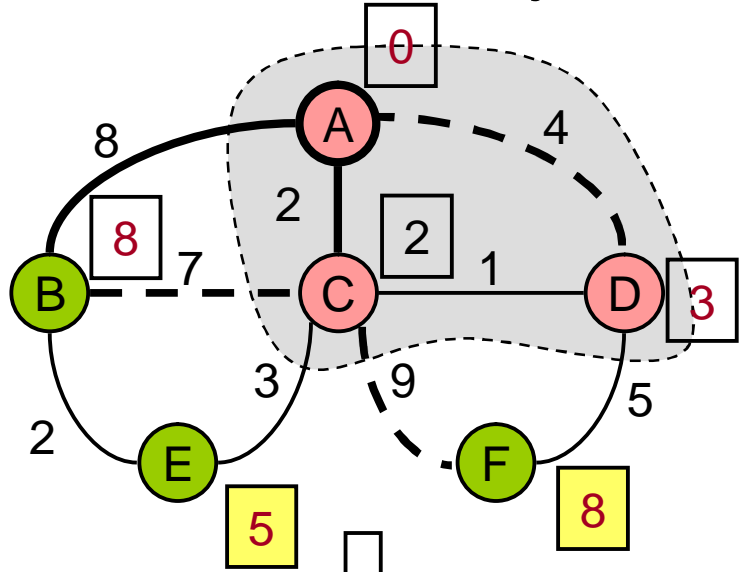
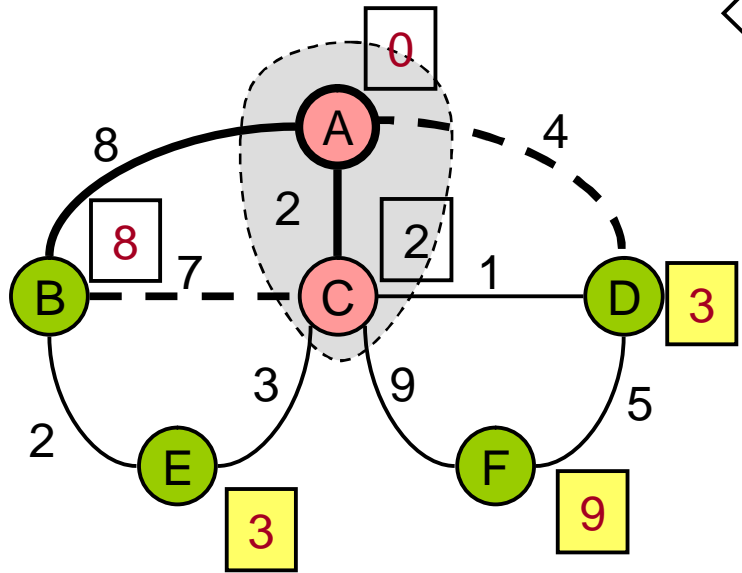
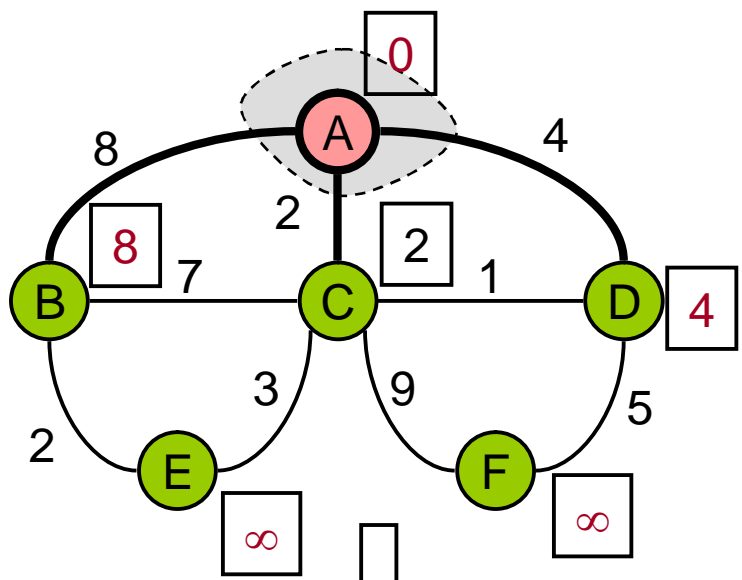
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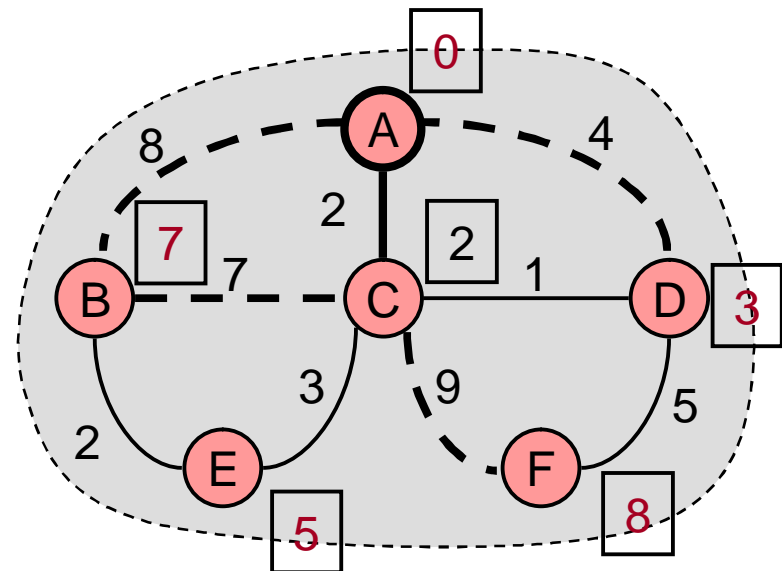
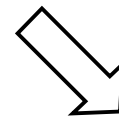
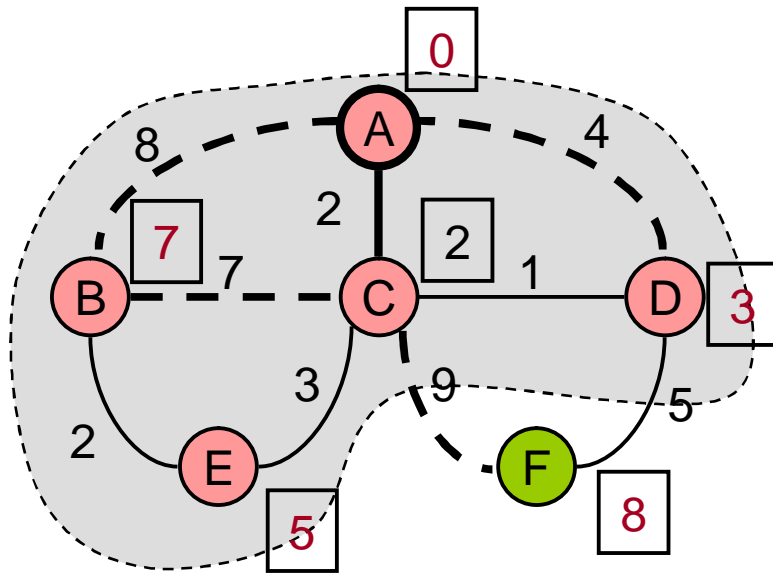
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Dijkstra



Dijkstra



Dijkstra

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(greedy)

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Dijkstra:

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(D,F)

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$d(F) \geq d(D),$

F

Dijkstra:

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$(|V|)$

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$(\log|V|)$

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. $(|V|*|E|)$ $(|E|*log|V|)$

(

-heaps)

. $(|E|+|V|*log|V|)$

(Fibonacci heaps) (Fredman

& Tarjan, 1984)

Online vs offline

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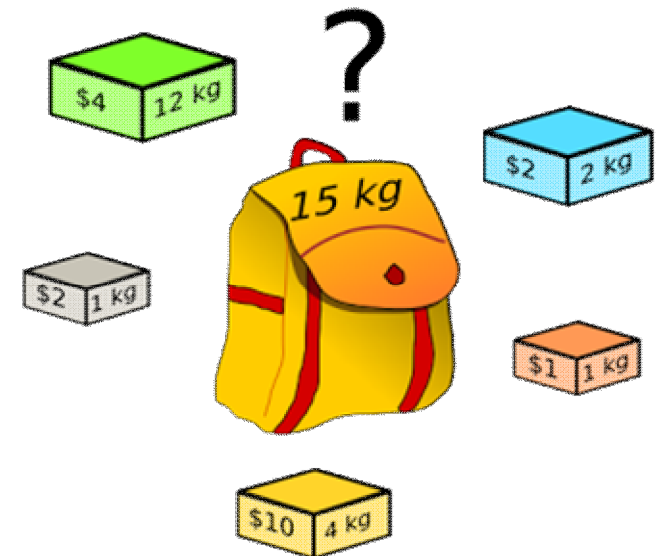
(the knapsack problem)

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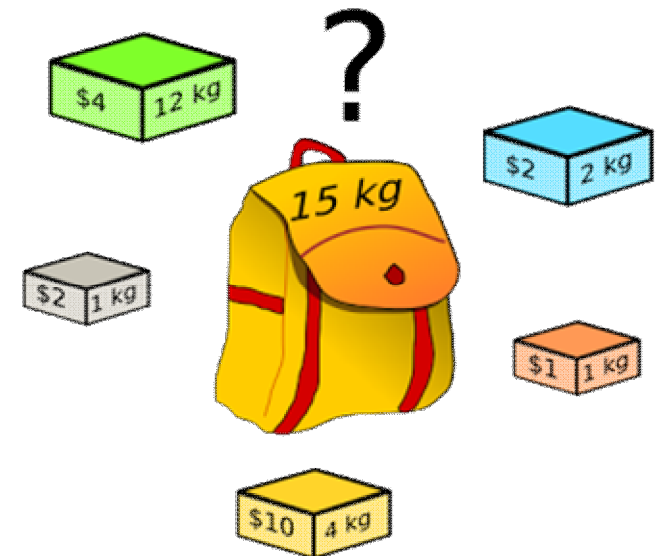
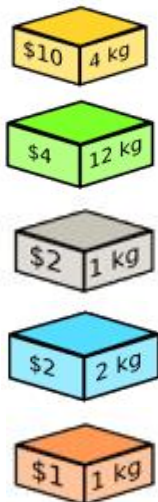
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(the knapsack problem)

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 . :
 (10), (4), / (2), (1)
 " ; :
 (10), (4), (2,1), (2,2), (1)
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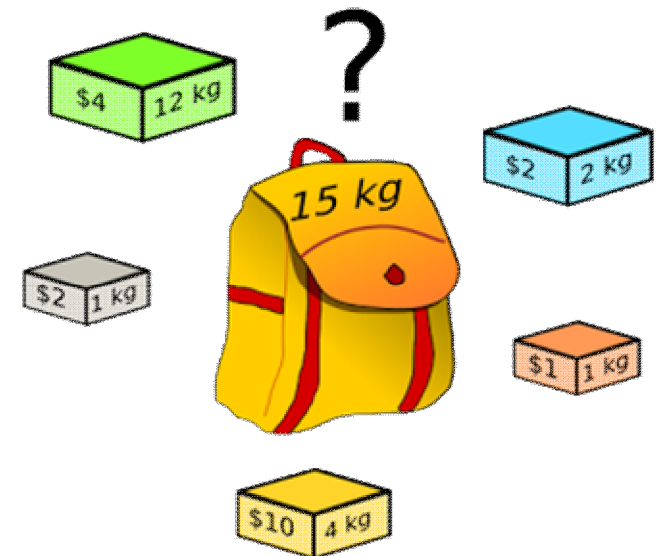
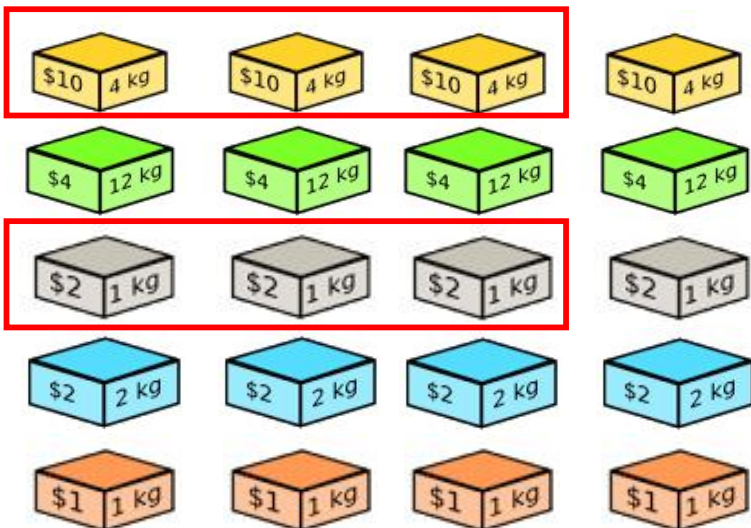


(the knapsack problem)

" (10,4), (10,4), (10,4), (2,1), (2,1), (2,1):
 36\$, 15kg
 " 50%

" (10,4), (2,1), (2,2), (1,1): 15\$, 8kg

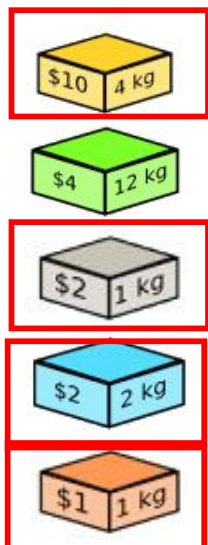
15kg, 36\$



(the knapsack problem)

" (10,4), (10,4), (10,4), (2,1), (2,1), (2,1):
 36\$, 15kg
 " 50%

" (10,4), (2,1), (2,2), (1,1): 15\$, 8kg



8kg, 15\$

